# The Impact of Environmental Variables in Efficiency Analysis: A fuzzy clustering-DEA Approach

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ABSTRACT

Data Envelopment Analysis (Charnes *et al*, 1978) is a technique used to evaluate the relative efficiency of any process or an organization. The efficiency evaluation is relative, which means it is compared with other processes or organizations. In real life situations different processes or units seldom operate in similar environments. Within a relative efficiency context, if units operating in different environments are compared, the units that operate in less desirable environments are at a disadvantage. In order to ensure that the comparison is fair within the DEA framework, a two-stage framework is presented in this thesis. Fuzzy clustering is used in the first stage to suitably group the units with similar environments. In a subsequent stage, a relative efficiency analysis is performed on these groups. By approaching the problem in this manner the influence of environmental variables on the efficiency analysis is removed. The concept of environmental dependency index is introduced in this thesis. The EDI reflects the extent to which the efficiency behavior of units is due to their environment of operation. The EDI also assists the decision maker to choose appropriate peers to guide the changes that the inefficient units need to make. A more rigorous series of steps to obtain the clustering solution is also presented in a separate chapter (chapter 5).

*Dedicated to my Father*
*(Late) Mr Sudhir Jagmohandas Saraiya*

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## Table of Contents


**1. Introduction** .......... **1**
1.1. Background .......... 1
1.2. Motivation .......... 4
1.3. Overview of the method .......... 6
1.4. Organization of the document .......... 6
**2. Literature Review** .......... **8**
2.1. Clustering and its Significance .......... 8
2.2. Distance and Dissimilarity Metrics: .......... 9
2.3. Clustering Techniques .......... 12
2.4. Review of Fuzzy set theory .......... 21
2.5. Fuzzy Clustering .......... 22
2.6. Efficiency .......... 23
2.7. Data Envelopment Analysis .......... 24
2.8. Treatment of Exogenous Variables in DEA .......... 28
2.9. Fuzzy Clustering and Efficiency Evaluation and Efficiency Measurement .......... 31
**3. Overview of the Method** .......... **34**
3.1. Description of Stages in a Clustering Algorithm and the Choice of Various Parameters .......... 39
3.2. The Fuzzy Clustering Algorithm .......... 41
3.3. Criteria for Selecting a 'Good' Fuzzy Clustering Solution .......... 42
3.4. Performing Efficiency Evaluation within Clusters .......... 46
3.5. The two-stage improvement plan .......... 48
**4. Results and Analysis** .......... **50**
4.1. Introduction .......... 50
4.2. The Dataset .......... 51
4.3. The Variables .......... 51
4.4. Principal Component Analysis .......... 55
4.5. Fuzzy Clustering Analysis .......... 58
4.6. Representative Cluster Object .......... 62
4.7. Summary of the Clustering Results .......... 65
4.8. The DEA Results .......... 69
**5. Alternate Clustering Solution** .......... **78**
5.1. Summary of the Clustering Results .......... 80
**6. Conclusions** .......... **85**
6.1. Some Issues for further Study: .......... 86
**References** .......... **90**

## List of Figures

Figure 2-1: Agglomerative and Divisive Clustering Techniques-A Graphical Representation ........ 13
Figure 2-2: Long drawn out cluster formed by single linkage method ........ 15
Figure 2-3: Envelopment Surface and Decision-Making Units ........ 25
Figure 2-4: Example of DEA Having Exogenous Variables ........ 29
Figure 3-1: A Two-stage Framework for Non-Discretionary Variables ........ 36
Figure 3-2: Example of a fuzz plot ........ 43
Figure 4-1: 3-D Scatter Plots of the Principal Components of the Environmental Variables ........ 57
Figure 4-2: Fuzz Plot of the Training Data Set with 7 Clusters and m = 1. 5 ........ 60
Figure 4-3: Fuzz Plot of the Full Data Set with 7 Clusters and m = 1. 5 ........ 61

## List of Tables


Table 4-1: Summary Statistics of the Output Variables .................................................. 53
Table 4-2: Summary Statistics of the Input Variables ..................................................... 53
Table 4-3: Summary Statistics of the Environmental Variables...................................... 55
Table 4-4: Summary Results from the Fuzzy Clustering of the Training Sample............ 59
Table 4-5: Summary Results from the Fuzzy Clustering of the Holdout Sample ............ 60
Table 4-6: Summary Results from the Fuzzy Clustering of the Complete Dataset.......... 61
Table 4-7: Degree of Belonging Across Clusters for Observation #11 ............................ 62
Table 4-8: Medoids for the Clusters Calculated After Assigning All Municipalities to Clusters ........................................................................................................... 63
Table 4-9: Means of the Environmental Variables for clusters ........................................ 64
Table 4-10: DMUs that are Closest to the Mean Vectors of the Cluster .......................... 64
Table 4-11: Number of Observations Assigned to Each Cluster...................................... 66
Table 4-12: Visual representation of the Kruskal-Wallis Test (10%level)....................... 67
Table 4-13: Summary of Clustering Results.................................................................... 69
Table 4-14: Number of Local and Global efficient units in each cluster.......................... 71
Table 4-15: Summary Cluster Results ............................................................................. 72
Table 4-16: Results of the Representative Observations (observation closest to mean and the medoid) ..................................................................................................... 73
Table 5-1: Comparison of methods followed in chapter 4 and chapter 5......................... 79
Table 5-2: Number of Observations Assigned to Each Cluster........................................ 81
Table 5-3: Visual representation of the Kruskal-Wallis Test (10%level)......................... 82
Table 5-4: The averages of the variables in Qualitative terms ......................................... 83
Table 5-5: The migration pattern between the two clustering solutions.......................... 84

# 1. Introduction

## 1.1. Background

Performance evaluation is an important aspect of any process management. It identifies the process inefficiencies and provides guidelines for improvement. The guidelines provide the decision maker with a path that will allow (relatively) inefficient units to improve their performance. Data Envelopment Analysis (hereafter referred to as DEA) (Charnes *et al*, 1978) is one such performance evaluation approach that identifies inefficiencies and also suggests possible improvements. A salient feature of using DEA is that the units or processes are compared to each other. This implies that the efficiencies or inefficiencies observed are relative to the set of units (or processes) considered for evaluation.

In order to better understand the subsequent topics some terminology is presented here. Note that the definitions of these terms appear again later in the document.

> Decision making unit (DMU): In the context of efficiency analysis this refers usually to a process that takes some inputs and converts them to some outputs
>
> Decision maker: An entity that has control over the inputs and the outputs of a DMU.
>
> Environmental variables: Variables over which the decision maker has little or no control. A crude example of such a variable may be the current in the water when steering a boat. The skipper may be able to control the sails and trim them at his will but the current is something beyond his control.
>
> Relative Efficiency: Efficiency of operation of a DMU compared to other DMUs.

There are several real world processes with features, which may not be under discretionary control of the decision maker. These are described by variables in the dataset and are called exogenous variables, non-discretionary variables or environmental variables.

The DEA method suggests changes in the inputs (outputs) of the under-performing DMUs to improve their relative efficiency. When the suggested change is for a non-discretionary variable (variable not controlled by decision maker), the decision maker may not be able to implement the recommendations of the DEA. This requires an alternate approach to treat environmental variables. The existing approaches either force the uncontrollable factors at a constant level (Banker and Morey, 1986) or rank the units based on the environmental variable (Ruggerio 1998).

The framework suggested in this research is another way of dealing with the uncontrollable variables in Data Envelopment Analysis. This approach apart from dealing with uncontrollable variables could also identify data structures such as outliers, leverage points and dominant observations, which may provide additional insight into the structure of the data. A fictional anecdote is presented below in order to explain the motivation for this research.

Consider an efficiency analysis in which several schools are compared against one another. The schools are the Decision Making Units. Without going into details of the variables that could be considered for such an analysis, assume that the output in this case is the average student score on a standardized test. Also assume that the schools are operating in varying environments. These environments can be characterized in terms of the composition of their student body. Some schools have majority of their students coming from low-income families, others have majority of their students coming from affluent families, and yet another class of schools have majority of their students from minority or immigrant families.

In a relative efficiency analysis such as DEA each school would come up with an efficiency score that reflects its performance relative to other schools. When all the above mentioned schools are considered together it is likely that the comparison would not be fair as some schools have inherent factors in the environment which affects their performance. Schools operating in a harsh environment would not be able to come up as efficient, since their environment hinders their efficiency.

Due to the differences in the school environments, the targets recommended by the DEA for the under-performing schools could be based on efficient schools that could be operating in very different environments. The decision maker would then have to account for the operational environment on a case-by-case basis to decide upon the targets for each under-performing school.

In order to have a fair comparison, these schools can be grouped according to their environments of operation. Such a grouping ensures that each group consists of schools that have a similar environment. A true relative efficiency analysis can then be performed on these groups. In such an analysis, a subset of schools from each group would be efficient. These (relatively) efficient schools will now serve as benchmarks to other less efficient schools within their respective environmental groups. Thus, a comparison that considers only the schools which share a similar environment allows the decision maker to truly see which schools operating within a given environment are good or bad, relatively speaking. It also allows the decision maker to set relevant targets for improving these under performing units. These targets are relevant because they are set by schools that operate in the same environment as the schools for which the targets are being set.

There is also value in comparing all the schools together as single group. It allows the decision maker to view the overall performance of the schools and set a second stage of targets. It also allows the decision maker to set targets for the locally efficient (efficient schools within their own group) to improve their performance further. This can be thought of as a long-term goal or rather a strategic vision.

In this anecdote we assumed that natural groupings are clear cut and well defined. In actuality, this may not be the case. There could be several schools that may be serving a not so low-income population, but at the same time cannot be included in the group serving the wealthy population. These are examples of schools that may belong to both groups. In order to deal with these kinds of data points the use of a grouping technique, in which a school may belong to more than one group with varying degrees of affinity or belonging, can be employed. Fuzzy clustering provides a method where the DMUs can belong to more than one group with varying degrees of belonging

In this research, we present the case of local municipalities in Greece and evaluate their relative performance under the influence of several environmental variables. The proposed two-stage framework accounts for the environmental variables in the first stage using fuzzy clustering followed by the second stage of Data Envelopment Analysis

### 1.2. Motivation

Data Envelopment Analysis is a linear programming based approach to measure relative efficiencies of a set of decision-making units. This method helps identify the units that are the best in terms of their production processes (best policies and adopted practices).

The framework of data envelopment analysis also suggests an input (output) mix in order to achieve the performance that would have the relative efficiency of unity. The method suggests suitable peers (DMUs that are efficient in their operations) and based on these peers DEA suggests appropriate targets required to be met by relatively inefficient units in order to become efficient. There may be an instance that the target set by the DEA method may not be achievable. The production process suggested by the linear programming based approach may be, in all likelihood, infeasible from an implementation point of view. This situation could occur due to the disparities in the operating environments. These environmental variables play a pivotal role in deciding the relative efficiency of the unit. Banker and Morey (1986) propose a method in which the environmental variables are forced to remain at a constant value. Rank based schemes on environmental variables are also not uncommon (Ruggeiro, 1988). In situations where there are multiple environmental variables, the existing methods often use a stage of regression in which the environmental variables are regressed on efficiency scores. There is a concern that during the stage of regression the distribution of the environmental variables and the underlying process that generates the data is often ignored (Simar and Wilson, 2003). The approach presented in this research overcomes this problem by using a non-parametric technique such as fuzzy clustering in the first of the two stages. The fuzzy clustering technique does not assume any distribution of the data and does not impose constraints. The framework described in this document promises a method to deal with the diverse and heterogeneous nature of the decision-making units.

Clustering methods have been used in classification studies for many years. Of late there has been a growing interest in the field of fuzzy clustering. The advantage of fuzzy clustering is it can identify data structures like bridges, strays and undetermined points in the data[1]. Conventional clustering methods would be forced to place such observations in only one group, thereby losing the additional information as mentioned above. In our research there may be units that would belong to more than one group.

This research suggests a framework where the non-discretionary variables are accounted for, prior to DEA by partitioning the data. This is accomplished by using fuzzy clustering. In this research we introduce two types of frontiers. The first is based on the efficiency analysis for each group (consisting of units with similar environments), this is called the local frontier. Each group produces its own frontier; this gives rise to several local frontiers (one for each group). The local frontier provides the inefficient DMUs (within the same group) with targets that will improve their efficiency. In other words, the DMU would have to make improvements to its processes based on other efficient DMUs operating in a similar environment. The second type of frontier comes from the analysis of the complete set of DMUs (all considered as a single group), this is referred to as the global frontier. The global frontier provides more strategic recommendations for a DMU to change its practices in order to overcome the barriers laid down by its environment of operation. In this research the notion of multiple frontiers is explored and an environmental dependency index is introduced. The environmental dependency index is a reflection of the environmental impact on the DMU's performance

[1] Bridges are data points that would cause two clusters to be recognized as a single cluster while performing hard clustering, since these points form a "bridge between these two clusters. Starys are points that do belong to a cluster but not strongly this information is lost in a hard clustering solution as there is no degree of belonging associated with each point and a cluster. Undetermined points are the ones that belong to each cluster with an equal degree of belonging.

## 1.3. Overview of the method

We present in this document a two-stage methodology, which will allow a researcher to deal with heterogeneous decision-making units. The fuzzy clustering based strategy presented in this research will allow the decision making units to be a part of more than one cluster. Selection of a suitable clustering solution in context of fuzzy clustering is as much an art as it is a science. For determining a clustering solution, sensitivity analysis is carried out. We use a few analytical measures such as Dunn's Partition Index, silhouette values and Kaufman's Index. Fuzz plots provide a vital visualization that tremendously aids selection of a fuzzy clustering solution. For the purpose of the DEA the decision-making units will be placed in those clusters to which these DMUs have at least an average degree of belonging. This choice guarantees that each observation will belong to at least one cluster. The choice of this analyst-imposed cut-off is a topic for further research. The proposed framework will provide a decision maker with a two-stage improvement policy for an inefficient decision making unit. The first improvement stage is an outcome of the local analysis (targets due to local frontier) while the second is due to the targets set by the global frontier. The environmental dependency index, which is calculated from the relative efficiency in the local analysis and relative efficiency in the global analysis, provides a way to evaluate a DMU's dependence on the operating environment of that particular cluster.

## 1.4. Organization of the document

The thesis document is organized as follows:

Chapter 2 contains a background of various clustering methods and their features. The associated literature is also covered in this chapter. The latter half of chapter 2 contains the literature associated with basic Data Envelopment Analysis Models.

Chapter 3 presents the description of the methods and the framework used in this research. It provides the description of the fuzzy clustering algorithm and the parameters associated with it. The chapter has a section on guidelines for selection of a 'good' fuzzy clustering solution. This chapter also contains a section on the non-radial Data Envelopment Analysis technique.

Chapters 4 and 5 include the results produced during the course of this research. Chapter 4 contains results obtained by performing principal component analysis on the complete data set and then splitting it into training and hold out while chapter 5 has results from the principal component analysis performed on the split samples. Chapter 5 provides clustering results with stronger statistical assumptions about using a true out of sample data to validate the principal components and clustering solution. This chapter also brings to light a lesser strength of the proposed approach; namely, that different assumptions used in clustering stage will have an effect on the subsequent DEA. This can however be overcome by using a more rigorous method, as the one presented in chapter 5. Finally, chapter 6 presents the conclusions and provides recommendations for further study.

# 2. Literature Review

This chapter contains the summary of the literature that is relevant to the remainder of this thesis. Section 2.1 discusses the concept of clustering and its significance. Section 2.3 discusses various clustering algorithms that are currently used widely. A review of the fuzzy set theory will be provided for the sake of completeness. The reader should keep in mind that this thesis is an attempt to combine two diverse topics; clustering and data envelopment analysis (DEA) (Charnes *et al*, 1978). Very little literature exists which addresses both the topics simultaneously. The concept of using clustering in conjunction with DEA is addressed in section 2.8.

## 2.1. Clustering and its Significance

The clustering problem is given as follows "Given a collection of **n** objects each of which is described by **p** characteristics or variables, derive a useful division into a number of classes. Both the number of classes and the properties of the classes are to be determined. " (Everitt, 1993, p-4)

The technique of clustering is as old as science itself. The process involves classification of existing data such that the variation in the data in the same group is as low as possible and that between groups is very high. This in other words means that the clusters should be tight within themselves and as far away from each other as possible. Clustering is loosely defined as a technique or a method used to find groups in data. More rigorously clustering can be defined as "*Partitioning* the data set into subgroups called clusters such that data points in the same cluster are more 'similar' to each other compared to data points in other clusters." The word partitioning is used in a more rigorous sense later on in this section.

This process can be imagined as the reverse of the well-known analysis of variance technique. Analysis of variance or ANOVA as its known is the method of finding the variance between the groups and that within groups. The important point is that the groups are predefined in ANOVA. They come about from the way the original experiment has been designed. Cluster analysis on the other hand is the method of finding those groups that would most likely resemble the original experiment levels. The technique does not make any assumptions about the multivariate normal distribution of data like most of the other statistical techniques that deal with multivariate data. Clustering is also known as the technique of unsupervised classification, meaning that the data decides the class it wants to belong to, based on some criteria that are specified by the user.

Several techniques have been proposed to obtain meaningful classification of data. Cluster analysis enables the analyst to find the underlying structure in data and many hypotheses that would answer many varied questions regarding the data. For example, how the data are related to each other within the population, can any inference be drawn on account of the before-mentioned relations, can an inductive argument be proposed to allow for a result to be applicable to all the data within a subset and more so can the same argument be continued to include the whole set of data?

## 2.2. Distance and Dissimilarity Metrics:

In order to cluster there has to be a numerical measure of association, which indicates the relationship among the different observations. The conventional approach is to have this measure of association between every pair of observations. The values of the measures of association are usually then stored in matrices. These matrices are called information matrices as they convey the information about the similarity or dissimilarity in the data to the clustering algorithm.

The conventional clustering algorithms handle the data in different ways. Most of the algorithms store the data in one-mode matrices or two-mode matrices. The one-mode matrices are nxn matrices, where n is the number of observations in the data set. The simplest kind of one-mode matrix would be the distance matrix. It should be noted here that matrices using conventional distance measures use either the upper or the lower triangular portion of the matrix, due to the symmetry requirement on any distance metric used.

The two- mode matrix is **nxp**, where **n** is the number of observations and **p** is the number of variables associated with each observation. The most intuitive form of the two-mode information matrix would be the multivariate co-ordinate data. The multivariate co-ordinate data gives the information about the distance between observations in $\Re^n$. Most clustering algorithms handle one-mode matrices and convert the two-mode information matrix into one-mode during a preprocessing step. Most of the information matrices use a distance function in a certain sense (to be explained later in this chapter). The distance function should satisfy the following conditions:

$D(X, Y) \geq 0$…non-negativity

$D(X, Y) = D(Y, X)$…symmetry property

$D(X, X) = 0$

$D(X, Y) + D(Y, Z) \geq D(X, Z)$…triangular inequality.

Where D represents the distance function, X and $Y \in \Re^n$ represent two different observations from the data set. D (X, Y) represents the distance between X and Y.

There have been some other metrics proposed that are not distance- based. The **H*** information matrix proposed by Gray and Ling (1984) is one of them. This matrix differs from the conventional distance matrix, in the sense that the property 3 above does not hold. Also negative values are allowed in the matrix, which violates property 1 above.

**The Modified Hat Matrix H***

The K-clustering procedure of Gray and Ling (1984) can be used to get the initial hard clusters. They advocate the use of the modified hat matrix, **H***. This matrix is one way to capture, both the leverage and the residual information in a regression setting. The clustering procedure can also be used to detect the influential observations and the subsets in regression.

Let $Q = (X|Y)$ (2-1)

$$H^* = Q(Q^T Q)^{-1} Q^T = H = ee^T / e^T e \qquad (2\text{-}2)$$

The **H** use of matrix was proposed by Hoaglin and Welsch (1978).

The **H*** can be viewed as a type of distance matrix; however it differs from the conventional distance matrix in the following:

The diagonal elements are not zero

The elements may be negative

The triangular inequality may not be satisfied

For the **H***, $h^*_{ij}$, represents the distance from the main mass of points when i=j. Hadi (1985) referred to this matrix as an information matrix, rather than a similarity or dissimilarity matrix. We shall continue to use these terms interchangeably because they convey the information about the 'nearness', in a certain sense, of an observation to another observation or to a group of observations. The large negative and positive values convey the information that the points are away from the main mass of points. Consider a large positive value of $h^*_{ij}$ this represents that the subset of observations indexed by i and j are away from the main mass and approximately on the same line away from the centroid of the main mass of points and on the same side of the main mass of points. Gray and Ling advocate the use of this as the information matrix to use for clustering when identifying influential subsets in data. Hadi (1985) suggested a different form of similarity when commenting on Gary and Ling's paper. However a rejoinder by Gray and Ling (Hadi, 1985) supported H* as a better measure of similarity. The H* matrix in a certain sense gives the user the information about the similarity in both leverage and outliers. The interpretation of the large positive values and the large negative values is explained in more detail in Gray and Ling (1984). Many analysts use the Minowski distance formulations, which have the general form as follows:

$$D_p(X,Y) = \left[ \sum_{i=1}^{n} |X_i - Y_i|^p \right]^{1/p} \qquad (2\text{-}3)$$

Where, $\mathbf{D_p}$ denotes the $\mathbf{p^{th}}$ Minowski distance type, **X** and $\mathbf{Y} \in \mathfrak{R}^{\mathbf{n}}$ denote the two different observations between which the distance is to be measured, **i** denotes the $i^{th}$ element of the X and Y vectors respectively. Various distance measures may be formulated using this function. The commonly used Euclidean distance is obtained when p=2 and the Manhattan distance is obtained when p=1. The former is also referred to as L2 metric and the latter as L1 metric. The L2 metric is particularly sensitive to outliers since the square of the distance is used (Kaufman and Rousseeuw, 1990).

The **H*** matrix has been used as the information matrix in this thesis. The preceding discussion assumed that the variables to be clustered were interval data; some of the techniques and procedures discussed earlier do not make sense for other types of data. There are several ways to compute a meaningful information metric for binary, nominal and ordinal variables. The reader is referred to a book by Kaufman and Rousseeuw (1990) for more details.

For the sake of completeness a mention must be made that the clustering technique may be used to cluster variables as well. The most commonly used metric for such cases is a coefficient of correlation to measure association between the variables. One may choose the parametric coefficient of correlation or the non-parametric depending on the specific application. The reader should note that the words information matrix and similarity matrix shall be used interchangeably in this document.

The cluster results greatly depend on the selection of variables. Some variables contain irrelevant information. The irrelevant variables add unwanted noise to the information metrics and take the clarity away from the clustering analysis. A detailed discussion on the variable selection in clustering can be found in Fowlkes (1988). The selection of 'good' variables may come about with a fair bit of trial and error complemented with the knowledge and experience of the analyst.

## 2.3. Clustering Techniques

There have been many clustering techniques discussed in the literature. A few of these techniques are presented in here.

The clustering techniques may be broadly classified in two main categories;

Hierarchical

Non-hierarchical

2.3.1. The Hierarchical Clustering Techniques

The hierarchical clustering techniques do not partition the data into particular number of classes or clusters in a single step. These techniques classify the data into a series of clusters. This series of clusters includes clusters of all sizes, from a single cluster containing all the data; to ‘n’ clusters that contain single observation each. These techniques are broadly classified in two groups, ref. Figure 2-1 namely;

Agglomerative technique: These hierarchical procedures start with ‘n’ clusters of single data point. They keep merging observations with the clusters till only one cluster containing all ‘n’ data points remains. The previous stage having ‘r’ clusters will yield ‘r+1’ clusters until there is one cluster. This technique depends on the way in which prior classifications are carried out, thus this technique can easily miss the global optimum as a result of one of the previous steps of the clustering algorithm

Divisive technique: These hierarchical procedures start with a single cluster of ‘n’ data points and keep dividing until there remain ‘n’ clusters, each having a single data point. The previous stage having ‘r’ clusters will yield ‘r-1’ clusters until only clusters with one data point remains. The divisive method offers an advantage in that it suffers less from the decisions made in the initial steps (Kaufman and Rousseeuw, 1990). The analyst may also stop the splitting of clusters when the required number of clusters has been reached.


**Figure 2-1: Agglomerative and Divisive Clustering Techniques-A Graphical Representation**

The agglomerative method is very commonly used and it is the method of choice in software implementations because of its computational ease. The divisive method on the other hand suffers from the drawback that the best partition has to be found during the first stage, which is a computationally expensive task. We shall discuss the agglomerative technique in more detail. The hierarchical methods have the advantage that the results can be shown graphically by the use of tree diagrams called dendrograms. It is evident that the distance metric will have to be recalculated at every stage in both techniques.

The similarity or information metrics that were discussed earlier may be used in hierarchical methods. There are many different algorithms to recalculate the distances available in the literature however most methods fall in theses broad categories:

1. Linkage methods
2. Centroid methods
3. Nearest neighbor method

### 2.3.1.1. Linkage Based Methods

*Single Linkage Method*

In this method the minimum distance to each object is calculated. At every stage, after the observations a and b have been merged to form a cluster c the new distance to another object p is computed as follows:

(Assume that **D** is the distance matrix that stores the information)

$$d_{cp} = \min(d_{ap}, d_{bp}) \tag{2 - 4}$$

If the clustering were to be performed on variables, in which case the metric of association would be the correlation matrix then the single linkage would be calculated as:

(Assume that **R** is the variance covariance matrix)

$$r_{cp} = \max(r_{ap}, r_{bp}) \quad (2-5)$$

The attempt in the single linkage method is to capture the closest neighbor object to the cluster that has been just formed. This method is capable of revealing non-ellipsoid clusters, which maybe at times represents the natural structure of the data. A drawback of this method is that it may lead to long drawn out clusters in which every data point will be similar to its adjacent data point however the data points at either ends of the chain may be quite dissimilar. This phenomenon is shown graphically in Figure 2-2. Some data sets may contain clusters that are chain-like and single linkage method helps identify them.

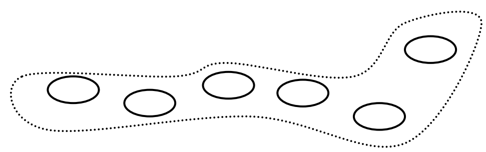


**Figure 2-2: Long drawn out cluster formed by single linkage method**

*Complete Linkage Method*

This method is similar to the single linkage except that at every stage the method captures the farthest object to the present cluster. After the observations **a** and **b** have been merged to form a cluster **c** the new distance to another object **p** is computed as follows

$$d_{cp} = \max(d_{ap}, d_{bp}) \quad (2-6)$$

If clustering were to be performed on variables, in which case the metric for association would be the correlation matrix then the complete linkage would be calculated as

$$r_{cp} = \min(r_{ap}, r_{bp}) \quad (2-7)$$

The attempt in the complete linkage method is to capture the farthest neighbor object to the cluster that has been just formed. This method gives rise to 'maximally connected sub-graph' clusters in a graph-theoretic sense.

*Average Linkage Method*

This method uses the average linkage of every link that is present. In the terms of the notations used so far this method may be written as

$$d_{cp} = (d_{ap} + d_{bp}) / 2 \quad (2-8)$$

This method is not affected by extreme values as much as the complete linkage method. Also there is no way to make statements about maximum or minimum similarity of clusters, due to the nature of computations.

#### *2.3.1.2. The Centroid Method*

This method replaces the cluster formed in a stage with its centroid vector. The distance matrix is recomputed at every stage. This method makes geometric and intuitive sense only when using Euclidean distances. If the mass of all the points is the same then the centroid and the center of gravity coincide. One interesting fact about the centroid method is that it may give rise to dendrograms that cross over. This is due the fact that distance or similarity is no longer monotone functions. The merge at a subsequent stage may occur at a lower distance as compared to its present stage. This happens because of the shifting of the centroid in either direction during each computation. The centroid vector is calculated as the average vector.

Consider two vectors **A**=$[3,2]^T$ and **B**=$[3,4]^T$ the centroid vector is calculated as **C**=$[3,3]^T$

*2.3.1.3. Nearest Neighbor Method*

These are variations of the linkage methods and they fall into what is referred to as the density linkage methods. These methods use non-parametric probability density estimates. They calculate a new form of the distance metric and then perform clustering based the on single linkage method. It should be noted here that the only difference is that the clustering is based on the new distance metric that is calculated at every stage.

The $k^{th}$ nearest neighbor method uses the $k^{th}$ nearest density methods described by Wong and Lane (1983). Consider a sphere centered at x and has its radius $R_k$, where $R_k$ is the distance between x and its $k^{th}$ nearest observation. Therefore the sphere has k observations in it. The density estimate at x is then given by

$$f(x) = \frac{k}{nV(R_k)} \qquad (2\text{-}9)$$

Where V ($R_k$) is the volume of the sphere with radius $R_k$ and n is the total number of observations. The new distance between the observations $x_i$ and $x_j$ is given by

$$d^*(x_i, x_j) = \begin{cases} \frac{1}{2}\left(\frac{1}{f(x_i)} + \frac{1}{f(x_j)}\right) \cdots\cdots\cdots d(x_i, x_j) \le \max\left(R_{ki}, R_{kj}\right) \\ \infty \cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots \text{otherwise} \end{cases} \qquad (2\text{-}10)$$

$R_{ki}$ and $R_{kj}$ represent the radius of spheres with $x_i$ and $x_j$ as centers respectively. The single linkage clustering is performed using the new distance metric.

There are other density-based methods that differ in the way the density estimate is computed. These methods assume no a priori knowledge about the shape of the cluster. The other methods that have been discussed are biased towards spherical cluster shapes, except for the single linkage method, which may detect non-ellipsoidal clusters.

*2.3.1.4. Error Sum of Square Method*

This method was proposed by Ward (1963). The method proposed was a very general framework for hierarchical clustering method based on optimizing some objective function criterion. The particular example in Ward's work was minimizing the error sum of squares. This particular approach has surpassed the general framework in terms of popularity. This method became popular due to intuitive sense in reducing the error sum of squares. This method however tries to find clusters of approximately equal size.

### 2.3.2. Divisive Clustering Methods

Divisive clustering algorithms are of two types; namely

Monothetic

Polythetic

The monothetic divisive clustering algorithms divide the cluster based on one variable at a time. The polythetic algorithms split the clusters on the basis of more than one variable. It should be noted that all the agglomerative techniques that have been discussed are of polythetic nature, in the sense that the clustering algorithm takes all the variables into consideration.

Macnaughton-Smith *et al* (1964) proposed a divisive clustering algorithm of polythetic nature. They argue that divisive algorithms do not make 'wrong moves', like the agglomerative algorithms in the initial stages, which cannot be rectified in the latter stages.

There are several textbooks that discuss most of the clustering algorithms that are used in practice. Kaufman and Rousseeuw (1990) describe clustering programs and their variations in a simple manner. The book by Everitt (1993) discusses the issues regarding clustering and their ramifications. The classic book by Hartigan (1975) gives an in-depth treatment to the subject and is considered one of the first works of its kind.

### 2.3.3. The Non-Hierarchical Clustering Techniques

These methods typically partition the data into k clusters, where k is user defined. It should be noted here that not all values of k would give rise to natural clusters. One may argue that in that sense hierarchical methods are superior since they allow the analyst to compare results for all values of k. This may not be completely correct since the hierarchical clustering methods do not necessarily give the best clusters, because in the initial stages there may have been 'moves' that may have been the 'best' for that stage but would lead to poor clustering in the final stage. (This may be viewed as strategy that finds the local optima, but does not guarantee optimum globally).

Non-hierarchical clustering techniques start with a user-defined value of 'k', which is the number of clusters to be formed. In general these techniques work by selecting 'k' initial partitions and then altering the memberships of the objects in those partitions to obtain better partitions. The algorithms differ in the way they approach the problem of finding better partitions. Anderberg (1973) discusses several different ways of selecting the initial 'k' partitions, some of which are described herein.

#### *2.3.3.1. Initialization of the non-hierarchical methods*

This section is not an exhaustive list of the methods used to select the seed points; the intention is to touch upon the issue. Seed points are the central objects around which a cluster is formed. There are several ways of choosing a seed point. The first 'k' observations may be chosen as seed points. The observations are labeled and 'k' random numbers, which lie between 1 and n, are generated. The observations with these numbers as their labels are chosen as seed points. However, the analyst may choose the seed points subjectively. Once the seed points are selected the algorithms try to minimize the 'within cluster' variance of the obtained clusters through an iterative process.

A simple iterative technique to minimize the variance is due to Frogy. Once the initial seed points are selected, every observation is assigned to the closest seed point until all the observations are exhausted. The seed point remains fixed during an iteration. The centroids are recalculated and used as seed points and again the data points are assigned to the seed points. The algorithm stops when the clusters don't change. Anderberg (1973) points out that about five-ten passes through the data should be sufficient in most cases for convergence.

McQueen (1967) suggested a method that is similar to Frogy. The first ‘k’ observations are chosen as seed points and the remaining observations are assigned to the clusters represented by those seed points. The centroids are computed every time an observation is assigned to a cluster. After one pass has been made through the data McQueen’s algorithm makes one more pass through the data and stops. It does not wait for convergence.

This method holds the distinction of being one of the cheapest methods computationally. The results may change with the initial ordering of the data, due to the way in which the seed points are selected. Rousseeuw (1989) argues that the centroid-based methods suffer because of their sensitivity to outliers. Anderberg (1973) gives a convergent variant of McQueen’s method. The algorithm by McQueen is also known as the k-means algorithm.

#### *2.3.3.2. Partitioning Around Medoids (PAM):*

In their book, Rousseeuw and Kaufman (1990) suggested a clustering method that was based on minimizing the average dissimilarity. This method was called Partitioning around Medoids, or PAM for short. Rousseeuw and Kaufman claim that this method is less sensitive to outliers compared to the methods described above. This method also gives exactly ‘k’ clusters; Frogy’s method may give less than ‘k’ clusters (k-means method also will give exactly k clusters). The method revolves around choosing ‘k’ observations from the data set. These objects are called medoids and are representative objects of the cluster. The remaining data points are assigned to the clusters defined by the medoids that are nearest to them.

The algorithm iteratively tries to find the best representative objects, such that the average dissimilarity is minimized. The centroid-based algorithms try to minimize the variance in the clusters. PAM may attain this objective if the square of the Euclidean distances is used. The ‘k’ medoids may be used as observations that are closest to the ones that are a part of that cluster. This method is robust in presence of outliers.

A further extension to this idea to accommodate large datasets is given by the algorithm CLARA (Clustering Large Applications). CLARA is also described in Rousseeuw and Kaufman (1990). CLARA uses a random mechanism to generate the 'k' medoids without going through all the possibilities. The authors strongly favor the L1 statistics opposed to the more commonly used L2 statistics.

## 2.4. Review of Fuzzy set theory

Zadeh proposed Fuzzy set theory in 1965 in his seminal paper "Fuzzy Sets". This theory was proposed as an extension and generalization of the classical set theory. In the classical set theory an element may or may not belong to a particular set. However in the fuzzy set theory an element or object may be a part of more than one set with varying degrees of belonging. This theory goes along way in capturing the vagueness of linguistic descriptions. The example that follows is an attempt to explain the concept. This example is drawn from Bezdek (1981).

Let h(x) define height of x in meters. Consider A1={x|h(x)=2}, this set contains all the elements that have a height of two meters. Consider another set A2={x|h(x)=2 ± 0. 05}. This set will contain elements that have their heights between 1. 95 and 2. 05 meters. Consider A3={x|h(x) is nearly 2 meters}, A3 is not a conventional hard set since there is not set theoretic realization for it in classical set theory. The function theoretic realization may be imagined for this kind of a set. Consider $u_3$: X→[0,1], the values $u_3(x)$ give the grade of membership of x in the fuzzy set $u_3$. This can be considered a generalization of the function theoretic realizations of sets A1 and A2, where

$$u_1(x) = \begin{cases} 1; x \in A1 \\ 0; otherwise \end{cases} \tag{2-11}$$

$$u_2(x) = \begin{cases} 1; x \in A2 \\ 0; otherwise \end{cases} \tag{2-12}$$

Therefore $u_3$ embeds the two-value logic in a more general form of the [0,1] continuous logic. In the above example, one can define many functions $u_3$ that satisfy axioms of being a fuzzy set. An example of a discrete $u_3$ is given below.

$$u_3(x) = \begin{cases} 1 & for \quad 1.95 \le h(x) \le 2.05 \\ 0.95 & for \quad 1.90 \le h(x) \le 1.95 \quad or \quad 2.05 \le h(x) \le 2.10 \\ \vdots & \vdots \qquad \vdots \\ 0.05 & \vdots \qquad \vdots \\ \vdots & \vdots \qquad \vdots \end{cases} \tag{2-13}$$

Given this information we can now say that if the h(x) satisfies the bounds given in the definition of $u_3$ then x belongs to A3 with the degree of belonging as defined by $u_3$. One would also have the information about the range in which the value of h(x) would lie given the degree of belonging. Above all one would have the information about the way in which each element is related to the other. Some would be 'more near' to the height of 2 meters and hence have a higher degree of belonging to the set A3. [2] The function $u_3$ is what is called the membership function in the fuzzy set theory parlance.

## 2.5. Fuzzy Clustering

Clustering is a technique in which a large set of objects is partitioned into smaller sets we call clusters that contain objects of similar attributes. The clustering techniques that have been discussed so far assign every data point to one unique cluster. In other words a data point may or may not belong to a particular cluster. In fuzzy clustering the object may belong to more than one cluster with varying degrees of membership. A typical fuzzy clustering algorithm takes an initial partition as a starting point and then assigns every observation to every cluster with varying degree of membership. The most interesting observations to the analyst are those that belong with more or less equal degree of belongings to all the clusters or the ones that belong very strongly to any one cluster. Fuzzy clustering gives an analyst a clearer understanding of the underlying structure of the data by uncovering information that would have been lost in 'hard clustering'.

[2] This example has been drawn from Bezdek J.C.; *Pattern Recognition with Fuzzy Objective Algorithms; 1981* pp10-12; Plenum Press, New York.

Fuzzy clustering appears to have been introduced by Ruspini (1970). The classification process was considered to be a breakdown of the probability density functions, which would give rise to the membership values of the observations to each cluster. In this sense the approach was more probabilistic in nature than fuzzy. However of late fuzzy theory has been used to deal with uncertainty in a certain sense. The method proposed optimization of a functional over all possible fuzzy classifications of the entire data set.

In a subsequent paper, Ruspini (1970) suggested numerical methods to deal with the optimization of the suggested functionals. The paper extends the thought of membership functions being the breakdowns of the probability density functions of the data.

May be one of the first fuzzy clustering algorithms to appear in the literature was the fuzzy k means algorithm of Bezdek and Dunn (1975). This algorithm was an extension of the hard k-means algorithm of McQueen. A complete description of the fuzzy clustering algorithm used in this research is presented in chapter 3.

## 2.6. Efficiency

Efficiency of any process is a function of input to the process and the outputs from the process. It has been classically defined as the ratio

$$\eta = \frac{output}{input} \tag{2-14}$$

The outputs and inputs pertain to the production plans of a *decision-making unit*. A *decision-making unit* refers to either a production process or an organization whose efficiency has to be evaluated. In more general terms a *decision-making unit* (DMU) is something that converts a given set of inputs into outputs. From a systems view point it may be treated as a black-box for the initial stage of the analysis.

This definition of (2-14) serves its purpose in a simple world of a single input and single output. However when the number if inputs and outputs increase the question is how to come up with one consolidated single input and a consolidated single output.

One of the most intuitive schemes of coming up with the consolidated virtual input and the consolidated virtual output would be to have a convex combination of the inputs and a convex combination of the outputs. The weights assigned to the different inputs and the different outputs depend on the expert knowledge of the decision maker. This brings a level of subjectivity the analysis. Also different decision making units may want to assign different weights to their inputs and outputs in order to become more efficient. Theoretically any unit may assume infinite efficiency just by putting the weights of zeros on all its inputs and a weight of one on the input that is not consumed at all.

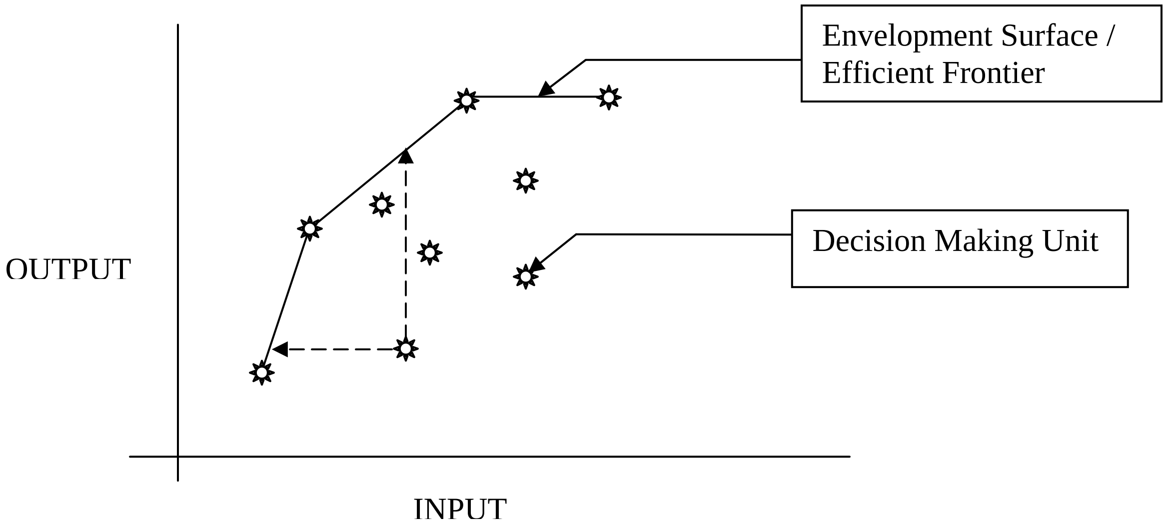
## 2.7. Data Envelopment Analysis

Data Envelopment Analysis, henceforth referred to as DEA, is a technique to measure relative technical efficiency of decision-making units. The technique can deal with multiple inputs and outputs. The technique is an extension of Farrell's (1957), approach. DEA is a non-parametric technique and makes no assumptions about the distribution of the data.

In a multiple input/output scenario the inputs and outputs are weighed and a consolidated input and a consolidated output is arrived at. DEA has a procedure that shall assign weights to the inputs and the outputs of each decision-making unit (DMU). The DEA methodology will give as its output the set of weights and the relative technical efficiency. The method also gives as its output an efficient frontier, which is a piece-wise linear convex locus which has the property that every unit on the frontier has a technical efficiency score of unity.

The technique further suggests a set of peers for every inefficient unit. The peers are the units with efficiency score of unity and most close to the inefficient unit in a certain sense. The inefficient unit may now emulate the production plan of the peers or any production plan, which is a convex combination of the production plan of its peers. The *production plan* is defined as the set of inputs and outputs of a DMU. This emulation or change will guarantee that the unit will become efficient.

Thus the DEA methodology suggests the changes that need to be made in order for an inefficient unit to be efficient. The changes suggested by DEA can be further analyzed




by viewing the DMU critically from inside, i. e. one must now open the black box and see where the changes can be implemented to attain the suggested production plan.

**Figure 2-3: Envelopment Surface and Decision-Making Units**

Figure 2-3 presents the concepts of a decision-making unit and an envelopment surface in a graphical medium. The case taken here is of a single input-single output. The envelopment surface is defined by the relatively efficient DMUs. The inefficient DMUs may move to the surface either by increasing their outputs (output orientation) or by reducing the amounts of inputs consumed (input-orientation), as shown by the dashed arrows.

2.7.1. Basic models in Data Envelopment analysis:

The following terminology shall be used in the following section and the sections henceforth.

DMU=decision-making unit: - This will denote any organization, production plan, etc. A set of ‘n’ DMU’s shall be compared with respect to their relative technical efficiencies. The $o^{th}$ DMU shall be denoted as $DMU_o$. Every DMU shall consume varying quantities of ‘m’ inputs and produce varying quantities of ‘s’ outputs. The $i^{th}$ input of the $j^{th}$ DMU shall be denoted by $x_{ij}$ and the set of inputs for the $j^{th}$ DMU shall be denoted by the vector $\mathbf{X_j}$. The $i^{th}$ output of the $j^{th}$ DMU shall be denoted by $y_{ij}$ and the vector Yj shall represent the set of outputs for the $j^{th}$ DMU. The matrix $\mathbf{X_{mxn}}$ and matrix $\mathbf{Y_{sxn}}$ shall denote the input and the output matrices respectively for all the DMUs under consideration.

The DEA as we know it now is largely due to the work of Charnes *et al* (1978), when they used the fractional programming implementation of the technique to compare the relative technical efficiencies of school districts. The essential part of this formulation is the conversion of the multiple input/output form to the virtual single input/single output form. The ratio of this single virtual output to the virtual input gives the technical efficiency of the decision-making unit. This is the ratio to be maximized and forms the objective function for $DMU_o$, which is the DMU in question. One important aspect of the DEA technique is the formulation of constraints.

The weights that go to form the virtual input and output are such that when the same weights are applied to any other DMU, the efficiency score of the other DMU does not exceed unity.

The actual mathematical formulation follows.

$$\begin{aligned}
&\max_{u,v} \frac{\sum_r u_r y_{ro}}{\sum_i v_i x_{io}} \\
&s.t \\
&\frac{\sum_r u_r y_{rj}}{\sum_i v_i x_{ij}} \le 1, \quad \forall\, j = 0,1,2,\ldots,n \qquad (2\text{-}15) \\
&\frac{u_r}{\sum_i v_i x_{io}} \ge \varepsilon, \quad \forall\, r = 1,2,\ldots,s \\
&\frac{v_i}{\sum_i v_i x_{io}} \ge \varepsilon, \quad \forall\, i = 1,2,\ldots,m
\end{aligned}$$

This fractional program (2-15) has an infinite number of solutions. If (u*, v*) is a solution to this problem, then (cu*, cv*) is also a solution to the problem, c≥0. The above fractional program may be transformed into an equivalent linear program. This linear program is such that only one representative solution is selected form the infinitely many solutions. This is the solution that has the characteristic that $v^T X_o = 1$. The linear programming formulation follows.

$$
\begin{aligned}
&\max_{\mu,\nu} \omega_o = \sum_r \mu_r y_{ro} \\
&s.t \\
&\sum_i v_i x_{io} = 1 \\
&\sum_r \mu_r y_{rj} - \sum_i v_i x_{ij} \le 0 \\
&\mu_r \ge \varepsilon \\
&v_i \ge \varepsilon
\end{aligned}
\qquad (2\text{-}16)
$$

The dual of the above LP is given as:

$$
\begin{aligned}
&\min_{\theta,\lambda,s_r^+,s_i^-} z_o = \theta - \varepsilon \sum_r s_r^+ - \varepsilon \sum_i s_i^- \\
&s.t. \\
&\sum_j \lambda_j Y_j - s^+ = Y_o \\
&\theta X_o - \sum_j \lambda_j X_j - s^- = 0 \\
&\lambda_j, s_r^+, s_i^- \ge 0
\end{aligned}
\qquad (2\text{-}17)
$$

From the theory of LP, dual and the primal have the same optimal solution. Also the terms primal and dual are interchangeable. The primal is the dual of the dual. In DEA terminology the dual given above is referred to as the primal and the primal is referred to as the dual. That terminology shall be continued in this document. These models are presented in this section for the sake of completeness. The choice of the appropriate model often times depends on the underlying production process.

The BCC model was proposed by Banker *et al* (1984). The formulation of the model is given below

$$
\begin{aligned}
&\min_{\theta,\lambda,s_r^+,s_i^-} z_o = \theta - \varepsilon \sum_r s_r^+ - \varepsilon \sum_i s_i^- \\
&s.t. \\
&\sum_j \lambda_j Y_j - s^+ = Y_o \\
&\theta X_o - \sum_j \lambda_j X_j - s^- = 0 \\
&\sum_j \lambda_j = 1 \\
&\lambda_j, s_r^+, s_i^- \ge 0
\end{aligned}
\qquad (2\text{-}18)
$$

The dual of this problem is given as follows:

$$\max_{\mu,\nu} \omega_o = \sum_r \mu_r y_{ro} + u_o$$
$$s.t$$
$$\sum_i v_i x_{io} = 1$$
$$\sum_r \mu_r y_{rj} - \sum_i v_i x_{ij} + u_o \leq 0 \quad \forall j = 1 \, to \, N \qquad (2\text{-}19)$$
$$\mu_r \geq \varepsilon$$
$$v_i \geq \varepsilon$$
$$u_o \text{ is free}$$

## 2.8. Treatment of Exogenous Variables in DEA

Exogenous variables are those that are not under the direct discretionary control of the decision maker. The normal DEA procedures implicitly assume that the decision maker can control all the variables. The output of the DEA models discussed earlier may try to set targets for these variables. The DEA models discussed earlier do not make a provision for the non-discretionary or exogenous variables or environmental variables. We shall use the terms *exogenous* and *non-discretionary* interchangeably throughout this document. One must realize that only the variables that can be changed are the discretionary variables.

The view of treating exogenous variables with a different modeling approach will lead to different results and a different frontier. The underlying approach in its fundamental sense is as follows. The model should have a provision built in such that the output will not suggest a change in the non-discretionary variable values in order to make the inefficient DMUs more efficient. This procedure will then ensure that the projection of the inefficient units is at a different point on the frontier. If the analyst does not explicitly account for the exogenous variables the model may suggest some change in those to achieve efficient performance. The reader will appreciate that it may not be possible to change variables like ‘minority percentage in population’ even if the model suggested this change.

The following example will show how this happens.

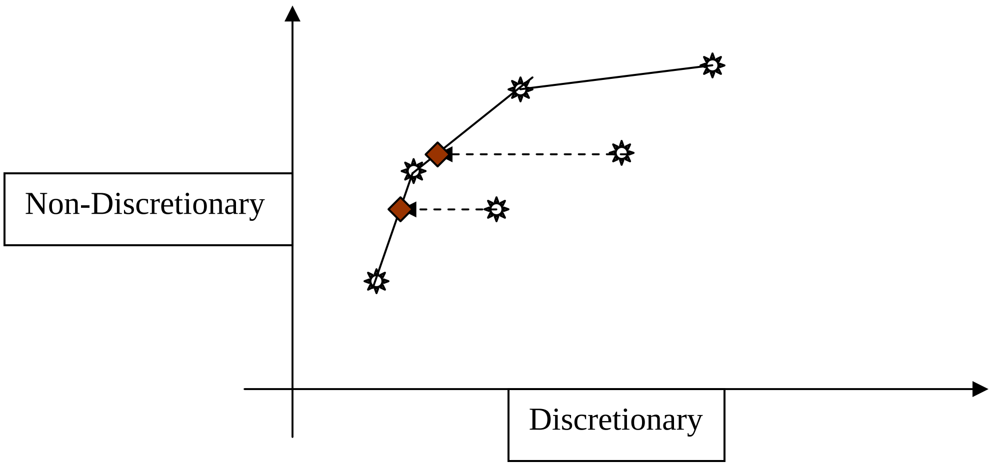



**Figure 2-4: Example of DEA Having Exogenous Variables**

Figure 2-4 shows a case of 6 DMUs each having a normalized consolidated input and two outputs. One of the outputs is discretionary and the other is non-discretionary or exogenous. This is an output-oriented model's representation. In Figure 2-4 the diamonds show the one way in which the inefficient units may make a change in the production process to become efficient. The movement is possible only along the direction of the discretionary variable, which is the horizontal axis in Figure 2-4. The value of the exogenous or the non-discretionary variable is kept fixed.

Banker and Morey (1986) introduced a formulation that treats the exogenous variables in a special manner. The model will not suggest any changes (increase of the output or decrease of the inputs) for any variable that is not within the discretionary control of the decision maker. The model formulation is given as below.

We consider the output-oriented model in this case.

$$
\begin{aligned}
&\max \ \left\{\varphi_o + \varepsilon\left(\sum_{r\in v_D} s_{ro}^- + \sum_{i=1}^{M} s_{io}^+\right)\right\} \\
&st: \\
&\sum_{j=1}^{N} \gamma_j y_{rj} - s_{ro}^- = \varphi_o y_{ro} \quad r \in v_D \\
&\sum_{j=1}^{N} \gamma_j y_{rj} - s_{ro}^- = y_{ro} \quad r \in v_F \\
&\sum_{j=1}^{N} \gamma_j x_{ij} + s_{ro}^+ = x_{io} \quad i \in \{1,\ldots,M\} \\
&\sum_{j=1}^{N} \gamma_j = 1 \\
&\varphi_o, \gamma_j, s_{ro}^-, s_{ro}^+ \geq 0
\end{aligned}
\qquad (2-20)
$$

If the Archimedean poses any problems while solving the above formulation it should be dropped and the two-stage approach can be adopted. The first stage will optimize the efficiency score while the next stage will optimize the slacks. The Archimedean is just a way of prioritizing the optimization of the efficiency score over that of the slacks in a single stage.

One more way of comparing the DMUs in presence of the exogenous variables was introduced by Rugerrio (1996). This method will ensure that once the DEA is run, and all the units have been assigned weights, the comparison of the units to determine efficiency will not consider every unit. The comparison procedure will compare the unit under scrutiny with only units that operate under harsher environments. The procedure is typically implemented by using a certain form of ranking rule which is then use to determine which units to compare after the weights have been assigned. The output-oriented model proposed by Ruggerio is given on the following page.

We shall consider the output-oriented model.

$$\max\left\{\varphi_o + \varepsilon\left(\sum_{r=1}^{S} s_{ro}^{-} + \sum_{i=1}^{M} s_{io}^{+}\right)\right\}$$

*st:*

$$\sum_{j=1}^{N}\gamma_j Y_j - s_o^- = \varphi_o Y_o$$

$$\sum_{j=1}^{N}\gamma_j X_j + s_o^+ = X_o$$

$$\sum_{j=1}^{N}\gamma_j = 1 \qquad (2-21)$$

$$\gamma_j \geq 0 \forall_j \ni Z_j \leq Z_0$$

$$\gamma_j = 0 \forall_j \ni Z_j > Z_0$$

$$\varphi_o, \gamma_j, s_o^-, s_o^+ \geq 0$$

*ε is a non-Archimedean*

The above model assumes that the subsets of efficient units that are used for comparison of the inefficient DMU are operating in at least as harsh an environment as the DMU under observation. The variable captures the effect of the non-discretionary variable. It can be assumed that the variable Z behaves such that the higher the value of Z more favorable environment of operation for the DMU.

## 2.9. Fuzzy Clustering and Efficiency Evaluation and Efficiency Measurement

Fuzzy clustering has been used as method to detect outliers and leverage points in the data (Seaver and Triantis, 1992). The idea they have provided is that the observations that are identified as unique (outliers or leverage points) by the fuzzy clustering procedure correspond to the observations that are extreme in terms of efficiency behavior (either efficient or inefficient). In this way, the fuzzy clustering approach can be used as a way to validate the results obtained by efficiency measurement approaches or provide insights into the inconsistencies of the different efficiency measurement approaches. Specifically, they use the fuzzy clustering procedure in conjunction with DEA (Banker *et al*, 1984) and full-frontier (Aigner and Chu, 1968) production function approaches to explain the inconsistency between the results of the two methods that determine the efficiency of the production plans.

They take the data of the three linerboard-manufacturing facilities and provide a classification scheme of four categories of efficiency (efficient, scale efficient, inefficient and other). This procedure helped in isolating unique data points that were classified as efficient by the linear programming or the full frontier production function methods. Unique data points were those, which exhibited efficiency due to presence of high idle times in their production cycles. They conclude that the use of fuzzy clustering in conjunction with approaches that determine efficiency measures yield a higher amount of information from the data.

Seaver, Triantis and Reeves (1999) show that the concept of fuzzy clustering can be used to detect the influential subsets in regression. They performed a sensitivity analysis on the fuzzy clustering results by varying the degree of fuzziness and the number of clusters and in this way detected influential subsets in the data.

They compared the fuzzy clustering results obtained with the well-known Cook's index, Andrew-Pregibon statistic and the internal and external studentized residual. They concluded that the fuzzy clustering approach that detects influential subsets was easy to use and lends itself to the analyst in a more intuitive way. However one will have to use some regression diagnostics to confirm the presence of the influential subsets. The sensitivity analysis feature allows the analyst to study the unusual behavior of the data.

Hoopes Seaver, and Triantis (2004) proposed a fuzzy clustering based strategy to identify dominant observations within influential subsets of data. These observations can be explained using the classical production theory. The primary objective of this work was to compare the concept of dominance from two different view points; one from the fuzzy clustering point of view and the other from the pair wise dominant point of view. Identifying the dominant observations in a subset is an important aspect of efficiency analysis and this can be done by using a fuzzy clustering based strategy, in conjunction with the pair wise dominance approach (Koopmans, 1951).

Athanassopoulos and Triantis (1998) studied the efficiencies of Greek municipalities. They use the fuzzy k-means clustering to perform post DEA analysis on the data set. They included the efficiency scores obtained from the DEA model evaluations along with the other inputs that were policy related or environmental in nature. The fuzzy k-means analysis in conjunction with DEA was able to classify the municipalities into different clusters based on their size, efficiency scores and their political influence.

A further analysis of individual clusters identifies public policy interventions for the municipalities that would make them more efficient.

This work goes a long way in showing how a second stage analysis after completion of the linear programming based efficiency performance evaluation would lead to a better insight into the data. This study also showed that in politically sensitive environments where the environmental factors bears a lot of weight on the behavior of a unit, a second stage approach like fuzzy clustering might provide some more information about the structure of the inefficiencies.

The description of the fuzzy clustering algorithm used by Triantis and Seaver is given below.

The algorithm explained here is an extension of the K-clustering procedure of Gray and Ling (1984). This algorithm was proposed by Seaver and Triantis (1992) to detect influential observations and influential sub-sets.

The hard partitioning of the data points is carried out using the k-th nearest neighbor approach of Wong and Lane (1983). This method does not assume any particular shape of the clusters. This approach uses the non-parametric probability density estimates to calculate a new dissimilarity matrix and then performs clustering using the single linkage algorithm.

Chapter three will discuss the fuzzy clustering algorithm and the specific DEA models that shall be used in this research.

# 3. Overview of the Method

During the phase of performance evaluation of an organization or a decision making unit (DMU) there may be several variables that are not directly controlled by the decision maker. Such variables may affect the production process but do not directly form a part of the production process. These variables are referred to as environmental variables. These variables play a role in determining the relative efficiency of the decision-making unit (DMU) or organization, as compared with its peers. Data Envelopment Analysis (DEA) (Charnes *et al*, 1978) provides the decision maker an efficient frontier, on which all the units are efficient with a relative efficiency score of unity. The frontier (obtained from DEA) proposes targets for the inefficient units and suggests changes needed for the inefficient units to become efficient. When Data Envelopment Analysis is performed considering all the decision-making units, comparisons take place between units that are in encouraging environments and units that operate in harsher environments. Take the case of the anecdote presented in chapter 1. If all the schools are compared to one another without accounting for their environmental variables, inherently, comparisons take place between schools that have majority of students coming from affluent families with those that have majority of their student body comprising of students from less affluent families.

Traditionally, environmental factors in efficiency analysis have been dealt with in several ways. The reader is referred to Banker and Morey (1986) and Ruggerio (1998). The techniques used to deal with such variables include, among others, ranking (followed by a subsequent stage of regression), use of hard constraints (forcing non-discretionary variables at a constant level), etc. On the other hand this research will propose a framework to deal with non-discretionary (environmental) variables using a separate stage prior to the relative efficiency analysis. The framework proposed in this research will suitably group the DMUs such that relative efficiency analysis takes place between units that operate in similar environments. An overall efficiency evaluation will also be used in which all the DMUs will be considered together without the environmental variables. The framework presented in this thesis provides the decision maker with a two-stage improvement policy for each DMU. As a result of this approach two types of frontiers will be generated for the same analysis; namely the local frontier (generated when only environmentally similar DMUs are evaluated using DEA) and the global frontier (generated when all the DMUs regardless of their environments are evaluated using DEA). The process of enabling a DMU to move to a local frontier can be thought of as short term planning and the movement of the DMU to the global frontier can be thought of as a long-term process in which a DMU can be competitive globally rather than being an efficient DMU in its own environment.

The method proposed in this thesis is a two-stage approach, Figure 3-1. Stage 1 will comprise of fuzzy clustering (Kaufman and Rousseeuw, 1990) to suitably group data into homogeneous clusters. The efficiency evaluations will then be carried out on these clusters. This will eliminate the need to incorporate these variables as hard constraints in the mathematical program. In this two-stage framework the efficiency analysis will be performed on DMUs on the groups obtained from stage 1. Choosing a suitable clustering technique ensures the environmental similarity within groups or clusters. Additionally fuzzy clustering stage may be able to highlight observations that are either outliers or dominant in nature. Outliers are observations or DMU that are statistically different from the rest of the population. One could visualize the outlier as a point so distinct from the rest of the data points that it does not have another data point in a reasonable neighborhood. A dominant DMU on the other hand is one that has significantly low inputs and high outputs compared to all the other data points in its set. Thus the fuzzy clustering stage has the ability to reveal additional information about the underlying production process. This approach will be particularly useful for analyzing datasets that contain DMUs operating in varying environmental conditions.

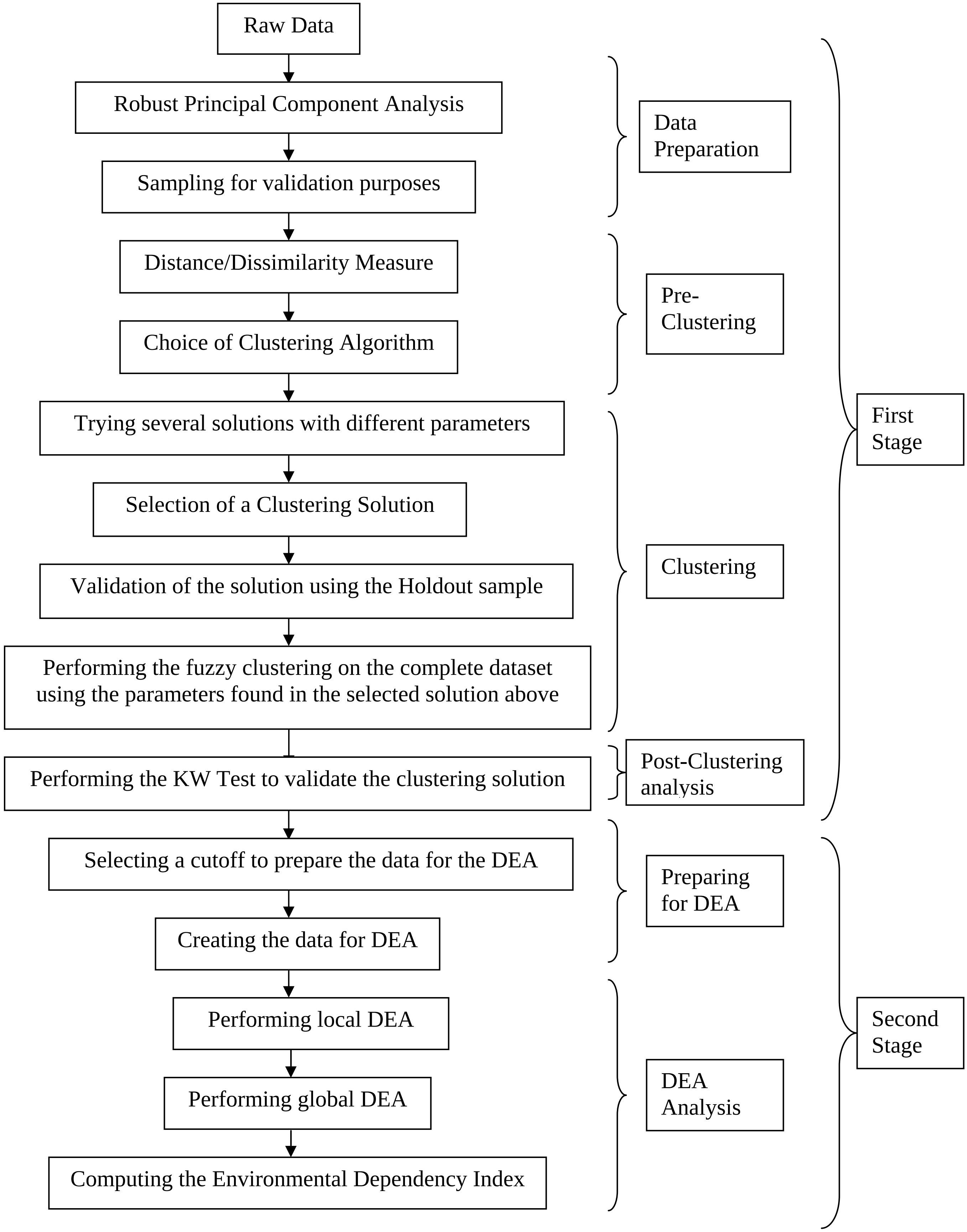



**Figure 3-1: A Two-stage Framework for Non-Discretionary Variables**

The data must be pre-processed in order to suitably group the data based on environmental variables. Robust principal component analysis is used in this research to ensure that the variables we use for clustering stage are orthogonal. Principal component analysis also serves the purpose of representing the data in a lower dimension. In our research the first three principal components are used. This accomplishes a dimensionality reduction from five environmental variables to three principal component factors. After performing the robust principal component analysis, the dataset was split into two samples; namely, the training and the validation or the hold out sample. This enables an analyst to validate the results obtained using a true out of sample data set. These two procedures, the robust principal component analysis and splitting the dataset fall under the data preparation stage in figure 3-1 above. After the data preparation stage is complete, the measure of dissimilarity that will be used in the clustering stage is decided upon. In this research the Euclidean distance is used as the measure of dissimilarity. The choice of dissimilarity measure is also governed to a certain extent by the choice of the clustering method or the algorithm that is chosen, which should also be decided by this point. Once a measure of dissimilarity is selected several clustering solutions must be tried on the training sample to find a suitable clustering solution. The selection of a suitable clustering solution can be tricky and to a certain extent depends on the analyst's intuition about the data. In order to validate the clustering solution the holdout sample is clustered with the same parameters obtained using the training set. If the clustering solution is as good in the holdout sample the clustering solution is applied to the complete data set. In order to explain the separation of the clusters and validate the clusters in the original variables space (note that the clustering was carried out on the factors obtained from the principal component analysis) Kruskal Wallis testing procedure is performed. A more rigorous method of using a non–parametric discriminant analysis may also be used at this stage. Once the fuzzy clustering is completed the observations must be assigned to clusters to prepare the data for DEA (note that in fuzzy clustering all observations belong to all clusters with varying degrees of belonging). A cut-off, which is the minimum value of the degree of belonging that an observation can have for a particular cluster an still be considered a part of that cluster for the DEA should be established. The observations are then assigned to their respective clusters based on the cut-off that is chosen. For the purpose of this research the cut-off was chosen as the average degree of belonging. This ensures that each DMU would be a member of at least one group for the DEA stage. Another way of working around choosing this cut-off would be to incorporate the degree of belonging directly into the linear program through some kind of a weighting scheme based on the DMUs degree of belonging. A method called gap analysis may also be applied to find the cut-off. Once the observations have been assigned to their clusters or groups DEA is applied within each group and also a global DEA is carried out. Finally the environmental dependency index (EDI) is computed which helps the decision maker realize to what extent the performance of a DMU is dependent on its environment.

Stage one of the two-stage approach laid out in Figure 3-1 comprises of suitably grouping data using fuzzy clustering. In Chapter 4 the clustering results are presented where the clustering is performed directly on the principal component factors this method assumes that each factor exerts the same amount of weight in the clustering analysis. In Chapter 5 the results presented reflect a scaling of the principal component factors such that each factor now exerts different weight. This weight reflects the variance in the original variable space.

The results of the clustering problem depend upon the following factors:

1. The features (variables) of the data that provide the information about the distance between the observations. Note that the usage of the word distance does not necessarily apply to the conventional definition of the word

2. Similarity or information matrix used

3. The type of clustering method used (along with the parameters used for clustering)

These factors are addressed individually in the subsequent Section 3. 1

## 3.1. Description of Stages in a Clustering Algorithm and the Choice of Various Parameters

### 3.1.1. Feature selection

Selection of features the clusters are based on is a critical component of the clustering process. Selection of 'unwanted' variables lead to clusters that do not present an informative structure. During this research different features (environmental variables or their derivatives such as the principal component factors) have been passed as inputs to the clustering algorithm. This feature selection is guided by the analyst's intuition and background knowledge of the data set. For the clustering performed in this research, the environmental variables that affect the operation of the DMU were considered. These variables were chosen based on the information given by the decision makers at the organizational level.

The process of selecting the relevant features is non-trivial with a heavy bearing on the results of the clustering algorithm. The following example shows the importance of feature selection.

Example: Consider a dataset containing the following variables:

a. Weight of the person

b. Height of the person

c. Residential ZIP code of the person

d. Age of the person

If the objective were to obtain clusters about the age, weight and height of a person the ZIP code data would add unnecessary information. The clustering results would therefore not provide accurate groupings based on the age, height and weight factors of the population.

### 3.1.2. Measure of dissimilarity (Information matrix)

Once the features have been selected, a suitable measure for expressing dissimilarities between observations must be chosen. The dissimilarity measure conveys the proximity of one data point to another, in a certain sense. Hartigan (1975) describes several ways in which a matrix that conveys this information can be formed. Euclidean distance measure can be used to capture the dissimilarity between observations. Another dissimilarity measure is the modified hat matrix (H*) suggested by Gray and Ling (1984). The Euclidean distance matrix provides the 'conventional' distance between the observations in 'n' dimensional space, n being the number of independent variables. The H* matrix conveys information about the effect of joint influence of the data points on an observation.

The Euclidean distance matrix is a simple nxn matrix, where n is the number of observations in the data set. This matrix contains the information about the spatial distance between the two observations. Intuitively the Euclidean matrix is easier to understand and visualize.

### 3.1.3. Why fuzzy clustering?

The stage 1 of the framework will cluster the data based on the environmental variables. This will allow comparison of units of a homogeneous environment. The use of fuzzy clustering (Kaufman and Rousseeuw, 1990) chosen for this purpose has been chiefly guided by the following:

1. Fuzzy clustering allows a data point to be a part of more than one cluster

2. Hard (conventional) clustering will not allow the above. This is important for the data points, which for example have about 49% membership to one cluster and 51% membership to another. Conventional clustering would have placed that data point in the cluster to which it had a membership value of 51%.

3. It should be noted that in fuzzy clustering, every observation belongs to every cluster. The determination of the cut off, for each cluster has ramifications on the final

efficiency evaluation. The cut-off is a scalar that determines which observations are assigned to each cluster. All observations that have degree of belonging to a cluster that is greater than or equal to the cut-off point are considered a part of that cluster. In this thesis the value '1/n' is chosen as the cut-off, where n is the number of clusters in the final clustering solution.

4. The sensitivity analysis carried out by changing the various clustering parameters such as the fuzzifier, the number of clusters, etc. may enable an analyst to detect influential observations and data sets in the first stage. Seaver and Triantis (1992) describe a method to identify influential observations and outliers during efficiency analysis using fuzzy clustering.

### 3.2. The Fuzzy Clustering Algorithm

There are many approaches to solve the clustering problem. Hartigan (1975) describes many algorithms and heuristics to solve the clustering problem. The fuzzy clustering approach is based on the fuzzy set theory proposed by Lotfi Zadeh (1965). There are several approaches to fuzzy clustering; a good explanation of various techniques is given in Bezdek (1981).

The method used in this research is called FANNY and is attributed to Kaufmann and Rouseeuw (1990). A brief description of the algorithm follows in this section. The algorithm tries to minimize the following objective function

$$C = \sum_{v=1}^{k} \frac{\sum_{i,j=1}^{n} u_{iv}^2 u_{jv}^2 \, d(i,j)}{2\sum_{j=1}^{n} u_{jv}^2} \qquad (3\text{-}1)$$

d(i,j) represents the dissimilarity between objects i and j or in this case the Euclidean distance (in terms of their environmental variables) between $DMU_i$ and $DMU_j$.

$u_{iv}$ represents the membership of object i to cluster v. k is the number of clusters that the fuzzy clustering solution will have. n is the number of observations in the dataset. The optimization problem has the following two constraints:

1. Membership value of an observation to a cluster is non-negative.

2. The sum of membership values of an observation across clusters is equal to unity.

These constraints are presented in the mathematical notation.

$$\begin{aligned} &u_{iv} \geq 0 \quad for\ i = 1,\ldots,n;\ v = 1,\ldots,k \\ &\sum_{v} u_{iv} = 1\ for\ i = 1,\ldots,n \end{aligned} \qquad (3\text{-}2)$$

A detailed description of the steps involved in the calculation of the membership function is given in Kaufman and Rousseeuw (1990). The solution to the above mentioned optimization problem is iterative.

### 3.3. Criteria for Selecting a 'Good' Fuzzy Clustering Solution

There are several solutions to a fuzzy clustering problem. These different clustering solutions are obtained by changing the number of clusters and the fuzzifier in different combinations. Not all solutions obtained by varying the parameters may be useful. A guide in selecting 'good' clustering solutions is described below. The reader should keep in mind that the selection of a fuzzy clustering solution is a subjective process, requiring fair bit of intuition. The steps outlined below are just a guide and do not guarantee the 'one best' fuzzy clustering solution.

The 'goodness' of the clustering solution can be measured using various indices. This research uses Dunn's partition coefficient, partition index due to Kaufman and the silhouette, to guide the user to select an appropriate clustering solution. Fuzz plots are a visual aid used to determine the quality of the clustering solution. The fuzz plots (Seaver, Triantis and Reeves, 1999) visually depict the assignment of data points to various clusters along with their degree of belonging to each cluster. An additional reason to evaluate several fuzzy clustering solutions is that the analyst may uncover some influential subsets in the data that would prove useful in the later analysis. For details of discovering influential subsets using fuzzy clustering, the reader is referred to Seaver, Triantis and Reeves (1999).

3.3.1. Fuzz Plots

The fuzz plots allow a visual representation of the membership values of the observations to the different clusters. These are obtained by overlaying a series of individual plots. Each individual plot is a plot of membership value on the y-axis against the observation number on the x-axis. The cluster numbers are denoted as the point markers. The fuzz plot serves the purpose of visually observing the fuzziness in the clusters; it also gives a good indication about the separation of the individual clusters. Many times these fuzz plots determine the clustering solution that should be used in the analysis. This visual technique by far is the simplest and a very good way of conveying information on the membership values of the observations to the particular clusters. The data is sorted in the descending order of their degree of belonging to each cluster.

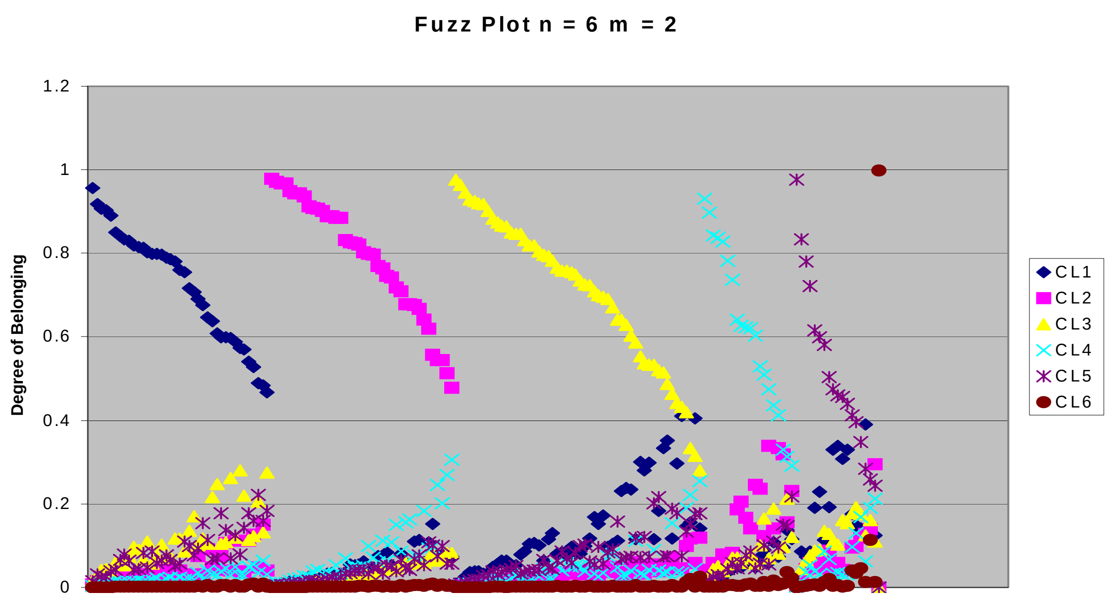



**Figure 3-2: Example of a fuzz plot**

The degree of belonging within each cluster decreases from left to right along the horizontal axis. The fuzziness is indicated by the number of observations in the center of the graph, i. e. observations with low degree of membership to several clusters. The clusters in this example are relatively fuzzy due to value of the fuzzifier being high (m = 2 in the case described above).

The numerical indices that help in selection of a clustering solution are described in the following section. The reader should bear in mind that the numerical indices together with the visual plots should be considered when finalizing a clustering solution.

### 3.3.2. Dunn's Partition Index

During fuzzy clustering analysis several solutions are analyzed and the one that makes the most intuitive sense to the analyst is chosen. The other factor in selecting the solution is the separation between the clusters. The reader can see that the hard clustering solutions are the limiting case. The hard clustering solution is one, in which the membership values are restricted to 0 or 1 and the summation of the membership values of the observation over the clusters is still 1. In other words in a hard clustering solution the observation belongs to one and only one cluster.

The Dunn's partition coefficient gives a numerical measure that describes the extent to which the fuzzy solution is apart from a hard solution. The Dunn's partition coefficient (1976) is defined as the sum of squares of all the membership values, divided by the number of observations. Refer to EQN 3.3

$$F_k(U) = \sum_{i=1}^{n} \sum_{v=1}^{k} u_{iv}^2 / n \qquad (3\text{-}3)$$

In the above expression, U is the final membership matrix. The element $u_{iv}$ represents the membership value of the $i^{th}$ element to the $v^{th}$ cluster. The total number of observations is n, while k denotes the number of clusters.

As seen from the expression above the Dunn's index directly depends on the number of clusters. Also the membership values, i.e., the elements of matrix U, depend on the value of the fuzzifier used during the clustering.

A completely hard solution will have the values of $u_{iv}$ restricted only to 0 and 1. In this case the Dunn's index will take a value of 1. When the solution is completely fuzzy, i.e., when all the observation belong to all the clusters with an equal degree of belonging, 1/k, Dunn's index takes a minimum value of 1/k. Thus Dunn's partition coefficient or index varies between 1 and 1/k. This can be normalized to vary from 0 to 1,where the value of

1 would indicate hard clusters and the value of zero would indicate a completely fuzzy solution. The transformation for normalization is presented below.

$$F'_k(U) = \frac{F_k(U) - 1/k}{1 - 1/k} = \frac{k\,F_k(U) - 1}{k - 1} \tag{3-4}$$

During the clustering analysis, extreme values of the normalized Dunn's partition index should be avoided. Neither a very hard solution nor a completely fuzzy solution is desirable. Typically, the values should not be very close to one or zero. This signifies that the cluster is not completely hard; neither has it fuzzed out completely. For a good fuzzy clustering solution this value should be high.

### 3.3.3. Silhouette

The silhouette as introduced by Rousseeuw (1987) describes how well an observation is classified in a given cluster compared to its neighbor.

Consider observation i classified in cluster A;

$a(i)$ = is the average dissimilarity of i to all other objects in its own cluster

We assume at this point that cluster is not a singleton cluster.

Consider any other C different from cluster A

$d(i,C)$ = average dissimilarity of object i to all observations of cluster C

Find C such that the least value of $d(i,C)$ is obtained

We have now:

$b(i)$ = min $d(i,C)$, where A and C are different

$$s(i) = \frac{b(i) - a(i)}{\max\{a(i), b(i)\}} \tag{3-5}$$

The average of $s(i)$ of all the observations in a given cluster is called the average silhouette value. It is used to aid in the search for the appropriate number of clusters by selecting the number of clusters that maximizes this value. When s is close to one, the object is well classified which indicates that it is more similar to objects within its cluster than to objects in a neighboring cluster. When s is close to negative one, the observation is poorly classified with its dissimilarity to other objects in its cluster being much greater than its dissimilarity to objects in the neighboring cluster. Thus a large value for this metric is desirable in selecting a good clustering solution.

3.3.4. Partition Index due to Kaufman:

$$D(U) = \frac{1}{N}\sum_{i}\sum_{v}(w_{iv} - u_{iv})^2 \qquad (3\text{-}6)$$

Here W represents the closest hard solution to the fuzzy clustering solution, in that $w_{iv}$ will be one or zero depending on whether the observation i would have belonged to cluster v in the hard solution. The closest hard solution in this context means the solution obtained by assigning the observation to the cluster to which it has the highest degree of belonging. Thus, the above function represents the average squared error of fuzzy clustering to its closest hard solution. The normalized version of the above function is shown below in (3-7)

$$D_k^{'}(U) = \frac{k\,D(U)}{k-1} \qquad (3\text{-}7)$$

A small value of this index represents a better clustering solution

Once the clustering (fuzzy) of the dataset is completed and a ‘good’ clustering solution is selected, the second stage of the framework is initiated. This stage includes performing a non–radial DEA on the clusters.

## 3.4. Performing Efficiency Evaluation within Clusters

Once the clustering solution has been arrived at, efficiency evaluation using DEA should be performed. Several different DEA runs have to be carried out. A DEA run must be performed for each cluster along with an additional DEA run using all the DMUs. Following is terminology to be used in the remainder of this document.

*Local Frontier*: This refers to the frontier defined by each cluster.

*Global Frontier*: This refers to the frontier obtained by considering all DMUs.

It should be noted that each cluster produces its own frontier. The global frontier shall form the boundary within which the frontiers produced by the individual clusters will lie. This is evident due to the convexity of the frontier in that the frontier envelops all the remaining data points.

### 3.4.1. Non-radial model

The Data Envelopment Analysis is performed using a non-radial model. The non-radial model is one in which the inputs (outputs) are assigned weights that are not in the same proportion. The production plan suggested by the analysis changes the mix of the inputs and outputs. This model is often more practical than the radial model of evaluating efficiencies. The reader should keep in mind that while evaluating efficiencies the environmental variables shall not be considered as they have been already accounted for in the clustering phase of the two-stage process. In other words the non-radial model shall be applied using the discretionary inputs and outputs.

The non-radial model is given as follows

$$
\begin{aligned}
&\max \frac{1}{s}\left\{\sum_{i=1}^{s} \varphi_{io}\right\} \\
&st: \\
&\sum_{j=1}^{N} \gamma_j y_{rj} \geq \varphi_{ro} y_{ro} && \forall\ r = 1 \ to\ s \\
&\sum_{j=1}^{N} \gamma_j x_{ij} \leq x_{io} && \forall\ i = 1 \ to\ m \\
&\sum_{j=1}^{N} \gamma_j = 1 \\
&\varphi_{io} \leq 1 \\
&\varphi_{io}, \gamma_j \geq 0
\end{aligned}
\qquad (3\text{-}8)
$$

The above model differs from a radial model such that the outputs are not all increased by a constant value, but are increased in varying proportions. The scaling factor of 1/s is used to normalize the efficiency between zero and unity. It should be noted that the objective function maximizes the sum of proportional increases for each of the s outputs of the production process. The constraints are the standard DEA constraints. However, double subscripts on φ denote that the proportion is changing depending on which output is considered in the constraint.

Once the local and global frontiers are calculated, the decision maker can adopt a two-stage improvement strategy. This is explained in the subsequent section.

## 3.5. The two-stage improvement plan

The inefficient units will now have a two-stage approach to improve their efficiency. In the first stage of improvement they must try and attain a point on the local frontier. This will ensure that the DMU is operating at least as efficiently as others in a similar environment. Once the inefficient unit achieves a production plan that ensures relative efficiency within in its own cluster, movement towards the overall frontier leads to the next stage of the improving its processes. This will ensure a continuous improvement in the production plan of the DMU. It should be noted here that as soon as a DMU makes an improvement in the direction of the overall frontier, the frontiers for the clusters have to be recalculated. This is due to DEA being a relative comparison and since one DMU has changed its original inputs and outputs, the original comparison no longer holds

### 3.5.1. Stage One Improvement

This refers to the changes that a DMU has to make in order to become efficient with respect to the other DMUs within its own cluster

### 3.5.2. Stage Two Improvement

This refers to the improvement a unit on the local-frontier must undergo in order to be a part of the global frontier.

The two-stage methodology would therefore give as its output a two-stage improvement plan that can be implemented to improve the performance of the under performing units.

The subsequent chapter sheds more light on the actual implementation of the framework. Chapter 4 has a description of the dataset and the results obtained from clustering. It also contains the results from the non-radial DEA performed to calculate the local and global frontiers.

# 4. Results and Analysis

## 4.1. Introduction

This chapter discusses the data set used (Section 4.2) and the description of the variables considered in the analysis in Section 4.3. The results from the principal component analysis are presented next in Section 4.4. The fuzzy clustering results are presented in Section 4.5. The DEA results are presented in Section 4.8. The concept of the environmental dependency index is introduced and presented in this chapter (Section 4.8.3).

Presented below is an outline of the procedures followed:

a. Classification of the variables as input, output or environmental

b. Principal Component Analysis on the environmental variables

c. Fuzzy clustering on the factors obtained from the principal component analysis

d. Re-assignment of observations which was based on their degree of belonging and a pre-defined cut off

e. Validation and explanation of clusters formed, on the basis of the original environmental variables using the Kruskal-Wallis testing procedure

f. Calculating a Representative object for each cluster: Medoid and an observation closest to the mean are presented.

g. Data Envelopment Analysis: Global Analysis (with all the observations included and considering all the variables excluding the environmental variables) and Local Analysis (one analysis for each cluster, which included observations assigned to that cluster only)

## 4.2. The Dataset

The dataset used in this research comes from Athanassopoulos and Triantis (1998). The data was obtained with the permission of the authors and is included in Appendix A-4.1 of this thesis. This dataset captures information that allows for the evaluation of the efficiency performance of Local Municipalities in Greece. The municipalities selected represent municipalities with a population greater than 2,000 inhabitants. This dataset contains a lot of diversity in terms of size, investments, dependency on the central government and other related policy variables. The description of the variables used in this research follows in Section 4.3.

## 4.3. The Variables

Variable selection is a non-trivial issue and it could be argued that the variables selected for analysis in this thesis do not capture all the policy related information that may affect the operations of the Local Municipalities in Greece. The objective of this research is to demonstrate the application of the fuzzy clustering along with a second stage data envelopment analysis to address the issue of incorporating environmental variables in efficiency analysis and not to come up with a comprehensive list of policy variables. The variable selection was kept close to the variables selected in the original paper. The description of the variables and the descriptive statistics follow. It should be borne in mind that some variables used in this research are surrogate variables. These variables have been used to measure some other effects, then those directly suggested by the variables.

The variable set has been divided in three disjoint sets: 1. Output variables; 2. Input Variables; 3. Environmental Variables.

### 4.3.1. Output Variables

These variables either directly or indirectly (in case of surrogate variables) capture the output measures of the Local Municipality operations.

*Actual Household:* This variable captures the information about the actual resident population in each local municipality. Due to extensive internal migration the census data may vary from this number. The houses that had a positive consumption of electricity in a preceding one-year period determined the number of actual households.

*Average House Area:* This variable is a surrogate variable capturing the information about the wealth and age of the local municipality. The larger houses have been built more recently and in the wealthier parts of the country. Also the authors state that wealthier citizens have different demands from the local municipalities and this different demand provides an additional demand for the services that the municipality can offer.

*Area:* This variable denotes the total built up area within the boundaries of a Local Municipality. The area served by the Local Municipality is obliged to contribute fees and charges in return for the services provided.

*Heavy Industrial Use Area:* This variable is a surrogate variable. The higher the heavy industrial use area, the higher is the service of pollution measurement provided by the municipality.

*Average Industrial Use Area:* This is a surrogate variable denoting the socio-economic profile of individual Local Municipality

*Tourist Areas:* This is a binary variable reflecting the tourist areas. The value of 1 represents the tourist area and vice-versa. The areas with tourist visitors have a higher demand for services from the local municipality.

The summary statistics of these variables are shown in Table 4-1

| Statistic / Variable | Mean | Standard Deviation | Minimum | Maximum |
|---|---|---|---|---|
| *Actual Households* | 13525. 93256 | 32192. 54751 | 1272. 3 | 377929. 5 |
| *Average House Area* | 70. 72325581 | 12. 7911215 | 40. 9 | 140. 8 |
| *Area* | 5935. 209302 | 5704. 459742 | 602 | 38300 |
| *Heavy Industrial Use Area* | 84849. 60465 | 209531. 288 | 363 | 2194356 |
| *Average Industrial Use Area* | *69. 20174419* | *55. 34481225* | *16. 6* | *527. 2* |
| *Tourist Areas* | 0. 168604651 | 0. 375495502 | 0 | 1 |

**Table 4-1: Summary Statistics of the Output Variables**

### 4.3.2. The Input Variables

*Wages Expenditure:* This is the salary and wages expenditure incurred by the Local Municipality (LM).

*Repair and Maintenance Expenditure:* This is the expense incurred by the LM.

The above two variables give a measure of operational costs of the Local Municipalities. The other components of the expense incurred by the LM include the Service Expenditure and investment in infrastructure. These other components of the expenditure are included in the environmental variable category.

The summary descriptive statistics for the Input Variable are given in Table 4-2

| Statistic / Variable | Mean | Standard Deviation | Minimum | Maximum |
|---|---|---|---|---|
| *Wages Expenditure* | 159351. 7965 | 319235. 5945 | 11303 | 3416945 |
| *Repair and Maintenance Expenditure* | 54772. 23837 | 104196. 1868 | 2000 | 908939 |

**Table 4-2: Summary Statistics of the Input Variables**

### 4.3.3. Environmental Variables

During the phase of performance evaluation of an organization or a decision making unit (DMU) there may be several variables that are not directly controlled by the decision maker in the short-term. These variables define the environment of operation of a DMU; and therefore have a bearing on the efficiency of operation of the DMU. Such variables are referred to as environmental variables. The following variables describe the policy related variables in the cost efficiency analysis of Local Municipalities in Greece.

*Service Expenditure:* This is a surrogate variable that describes the service consciousness of each LM. It impacts the ability of LM to deliver service to the community; this variable may be controllable over a long time frame.

*Income from Extraordinary Governmental Grants:* This variable indicates the degree of dependency on the central government. This is a substantial source of revenue from the Government and hence of considerable importance.

*Investment in Infrastructure:* These are investment activities made by the LMs in small to medium sized developmental projects. This investment is solely at the discretion of the LM.

*Political Party in charge of the Local Municipality:* This is a binary variable that takes the value of one if the party in charge of the LM is same as the central Government and zero otherwise.

*Fees and Charges Index:* This index reflects the effectiveness of the Municipality in exercising discretion in terms of charging citizens for services. This variable may also be controllable over a longer time frame.

The summary statistics for these variables are given in Table 4-3

| Statistic / Variable | Mean | Standard Deviation | Minimum | Maximum |
|---|---|---|---|---|
| *Service Expenditure:* | 11868. 7093 | 15392. 0523 | 18 | 134642 |
| *Income from Extraordinary Governmental Grants:* | 117167. 5698 | 160805. 6194 | 4211 | 1441722 |
| *Investment in Infrastructure* | 126854. 6628 | 161852. 1811 | 7596 | 1471497 |
| *Political Party in charge of the Local Municipality:* | 0. 645348837 | 0. 479804292 | 0 | 1 |
| *Fees and Charges Index:* | 76. 53604651 | 21. 72562781 | 31. 3 | 181. 8 |

**Table 4-3: Summary Statistics of the Environmental Variables**

## 4.4. Principal Component Analysis

The first stage of the framework described in this thesis requires the DMUs with similar observations to be grouped suitably based on their environmental variables. Robust principal component analysis was used to avoid the influence of correlation among the variables. Robust principal component analysis routine within NCSS™ software was used. The other benefit of dealing with lower number of mutually orthogonal factors (in our case 3 factors as opposed to 5 environmental variables) is being able to visualize the data easily, as shown in the scatter plots in Figures 4.1. Robust principal component analysis modifies the means and the covariance matrix of the dataset by a weight factor that is inversely proportional to the outlying-ness of the data points. This enables such a technique to work well even with datasets that contain outliers.

The selected components represent 85% of the variance structure of the original data. The cut off for the factors was chosen as 0.7 for the Eigen values. The cut off chosen in this case is acceptable in the literature and is proposed by Joliffe (1972). Some older statistics texts may refer to using 1 as the cut off point however that may seem to be too loose of a criterion. The sum of the Eigen values is the number of variables used in the principal component analysis each Eigen value represents the number or variables it captures.

The original dataset was split into two sample sets; namely, a training data set and a holdout dataset. This was done in order to validate the clustering solutions that were obtained using the fuzzy clustering algorithm. The training data set was randomly selected from the original data. Randomness was ensured by assigning a random number[3] to each observation in the dataset (the original dataset was pre-sorted alphabetically), the data was further sorted in the ascending order of this random variable. This was done in standard spreadsheet software. On this sorted data set another set of uniform random numbers was assigned. Using this second random number approximately 70% of the total 172 observations were assigned to the training sample. The training dataset resulted in 123 observations and the remaining 49 observations were assigned to the holdout sample. The clustering analysis on the holdout sample was run after a reasonable solution from the training dataset had been determined. Partitioning of data was performed to evaluate whether the holdout sample would yield a similar solution as the training sample and thus validate the clustering solution obtained on the training dataset. The robust principal component analysis was performed on both the dataset and the results are presented in Appendix A-4.2.

Figure 4-1 below shows the 3D scatter plots for the training dataset using the three principal components as axes. The three plots represent the same data; however the plotting axes are rotated for a comprehensive visualization. The scatter plots show some natural partitions in the data; the most evident being the two groups visible in the first scatter plot. As seen from Figure 4-1, there exists heterogeneity in the data that is captured by the factors. This heterogeneity shall be removed by use of a scientific method of data partitioning, such as fuzzy clustering. Thus DMUs with similar environmental conditions would belong to the same cluster. The clustering results for the training dataset and the holdout dataset are presented in Appendices A-4.3 and A-4.4 respectively.

[3] Microsoft Excel was used

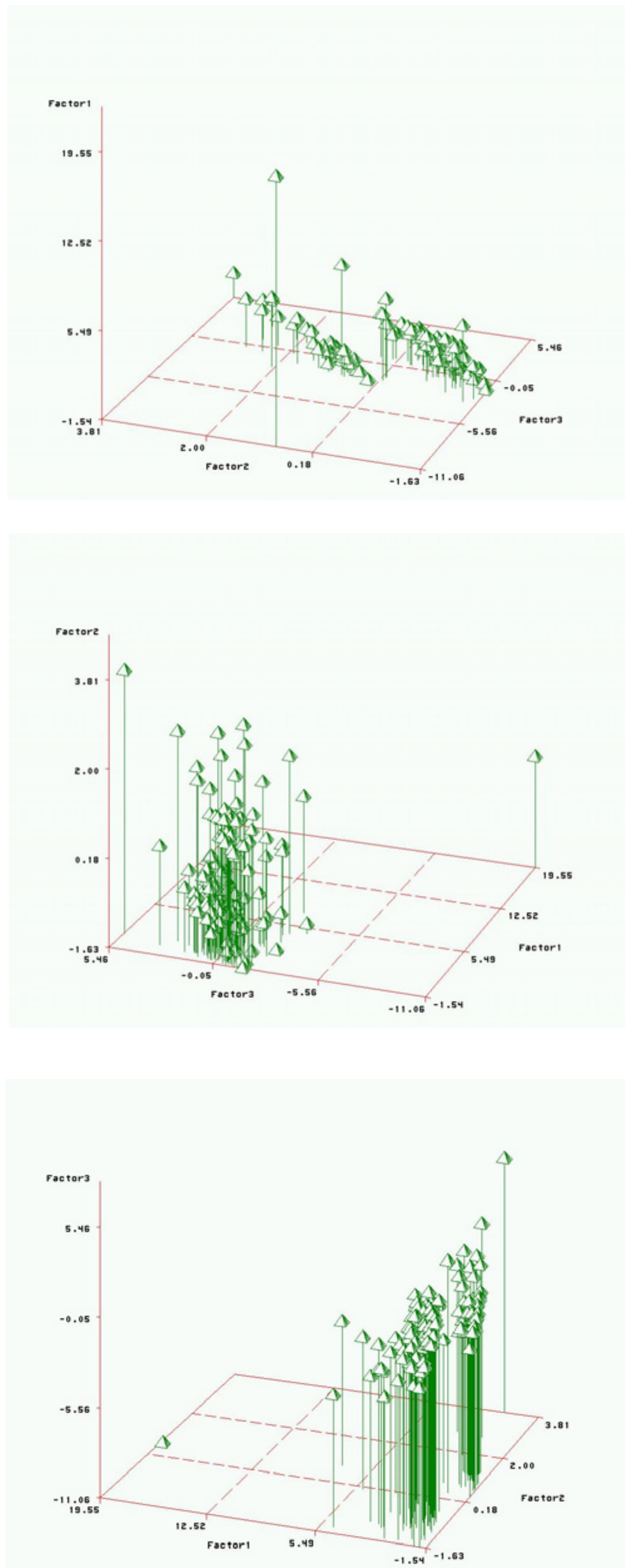



**Figure 4-1: 3-D Scatter Plots of the Principal Components of the Environmental Variables**

## 4.5. Fuzzy Clustering Analysis

As mentioned in Chapter 3 fuzzy clustering is used to consider the environmental variables in the first stage. This will ensure that the only DMUs being compared to one another in the relative efficiency analysis are operating in similar environments. The clustering analysis (using the Fuzzy clustering routine from the NCSS™ software) was carried out on the Principal Components obtained as discussed in Section.4.4. Euclidean distance was used as the metric of dissimilarity in the data. Euclidean distance is a very simple measure that captures the position of data points in space and is easily interpretable and intuitive. It should be noted that other methods may be employed to compute the dissimilarities between the observations for the purpose of clustering. The clustering was carried out using the Rousseeuw and Kaufman (1990) fuzzy clustering algorithm that is included in the NCSS software[4]. This algorithm has been explained in Section 3.3. Using different values of the fuzzifier and different number of clusters several clustering solutions were generated. The detailed clustering solutions are presented in the Appendix A-4.5. As explained in Section 3.4 the process of choosing a 'good fuzzy clustering' solution is subjective in nature. Various indices such as Dunn's partition index; Silhouette and the partition index due to Kaufman provide some guidance in selecting a 'good' clustering solution. The fuzz plots (Seaver, Triantis, Reeves (1999)) render the observations visually and enable the analyst to see the fuzziness in a particular solution. One of the guidelines in Sections 3.4 states that a 'good' clustering solution should not be very hard or very fuzzy. It should be noted that alternate methods for partitioning data may be used when appropriate. The purpose of this document is to demonstrate that fuzzy clustering can be used as a method to deal with environmental variables in the first stage of an efficiency analysis using Data Envelopment Analysis.

### 4.5.1. Summary of the Clustering Results (Training data)

Several clustering solutions were examined prior to selection of the final clustering solution. The value of the fuzzifier was selected to be 1.5 (m = 1.5) (the values 1.25, 1.5, 1.75 and 2.0 were attempted). A maximum of 20 iterations per clustering solution was

[4] From a drop down menu in NCSS

carried out. The fuzz plots from the clustering solutions that were also attempted are given in Appendix A-4.6. The indices for various solutions (using the value of fuzzifier at 1.5) that were used as a guide to select the final solution are presented below in Table 4-4

| Number Clusters | Average Distance | Average Silhouette | Partition Index (Dunn's), F(U) | Normalized F(U), Fc(U) | Partition index (Kaufman), D(U) | Normalized D(U), Dc(U) |
|---|---|---|---|---|---|---|
| 2 | 43.780805 | 0.430624 | 0.7824 | 0.5648 | 0.0682 | 0. 1363 |
| 3 | 34.594255 | 0.360891 | 0.6691 | 0.5036 | 0.1179 | 0. 1769 |
| 4 | 29.496855 | 0.379707 | 0.6323 | 0.5097 | 0.1317 | 0. 1756 |
| 5 | 26.166616 | 0.310612 | 0.5514 | 0.4393 | 0.1718 | 0. 2148 |
| 6 | 23.394134 | 0.339416 | 0.56 | 0.472 | 0.1589 | 0.1907 |
| 7 | 21.643589 | 0.331975 | 0.5275 | 0.4487 | 0.1765 | 0.2059 |
| 8 | 19.918334 | 0.27689 | 0.5189 | 0.4502 | 0.1905 | 0.2177 |
| 9 | 18.656094 | 0.213871 | 0.4728 | 0.4069 | 0.2319 | 0.2609 |
| 10 | 17.59711 | 0.229638 | 0.4648 | 0.4053 | 0.2385 | 0.2649 |

**Table 4-4: Summary Results from the Fuzzy Clustering of the Training Sample**

As observed from Table 4-4 above the solution with 7 clusters (n = 7) seems the most desirable solution. The value of the Silhouette is high whereas the average dissimilarity is low. The normalized indices, $F_c(u)$ and $D_c(u)$ are relatively high and low respectively. The fuzz plot for this solution, which is shown in Figure 4-2, indicates well-separated clusters without having too many observations fuzzed out (where most observations are in the middle of the plot). It also does not indicate very hard clusters (where most observations are in the top portion of the plot). This particular solution reasonably separates the data into relative homogeneous clusters based on environmental variables.

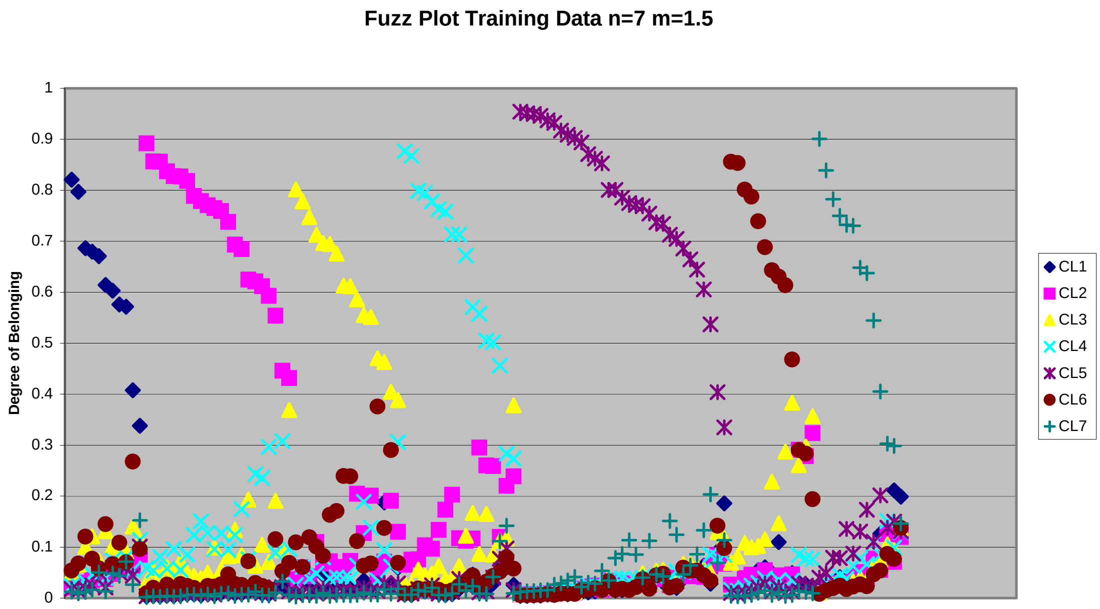



**Figure 4-2: Fuzz Plot of the Training Data Set with 7 Clusters and m = 1. 5**

### 4.5.2. Summary Clustering Results (Holdout sample)

In order to validate this clustering solution we look at the clustering solution using the same value of the fuzzifier for the hold out sample. The summary results for the holdout sample are presented in Table 4-5.

| Number Clusters | Average Distance | Average Silhouette | Partition Index (Dunn's), F(U) | Normalized F(U), Fc(U) | Partition index (Kaufman), D(U) | Normalized D(U), Dc(U) |
|---|---|---|---|---|---|---|
| 2 | 20.173637 | 0.336025 | 0.7118 | 0.4235 | 0.1099 | 0.2198 |
| 3 | 16.015494 | 0.296582 | 0.6224 | 0.4337 | 0.1489 | 0.2234 |
| 4 | 13.516823 | 0.301727 | 0.5932 | 0.4576 | 0.1555 | 0.2074 |
| 5 | 11.419911 | 0.377129 | 0.632 | 0.54 | 0.1185 | 0.1482 |
| 6 | 10.29967 | 0.27826 | 0.5527 | 0.4632 | 0.1838 | 0.2206 |
| 7 | 9.356878 | 0.310264 | 0.5565 | 0.4825 | 0.1605 | 0.1872 |
| 8 | 8.333453 | 0.32451 | 0.5912 | 0.5328 | 0.1524 | 0.1742 |
| 9 | 7.705769 | 0.339433 | 0.6023 | 0.5526 | 0.1406 | 0.1582 |
| 10 | 7.088657 | 0.336062 | 0.5926 | 0.5473 | 0.1407 | 0.1563 |

**Table 4-5: Summary Results from the Fuzzy Clustering of the Holdout Sample**

The holdout sample shows that the choice of the clustering solution was appropriate. In order to evaluate the relative efficiency of the DMUs fuzzy clustering has to be done on the complete data set. The summary results with regards to the indices and the, average distance and the silhouette are presented in Table 4-6 below.

| Number Clusters | Average Distance | Average Silhouette | Partition Index (Dunn's), F(U) | Normalized F(U), Fc(U) | Partition index (Kaufman), D(U) | Normalized D(U), Dc(U) |
|---|---|---|---|---|---|---|
| 7 | 32.198953 | 0.298528 | 0.4886 | 0.4034 | 0.2024 | 0.2362 |

**Table 4-6: Summary Results from the Fuzzy Clustering of the Complete Dataset**

The fuzz plot for this solution of the full data set using fuzzifier (m) as 1. 5 and number of clusters (n) as 7 is shown in Figure. 4-3 below.

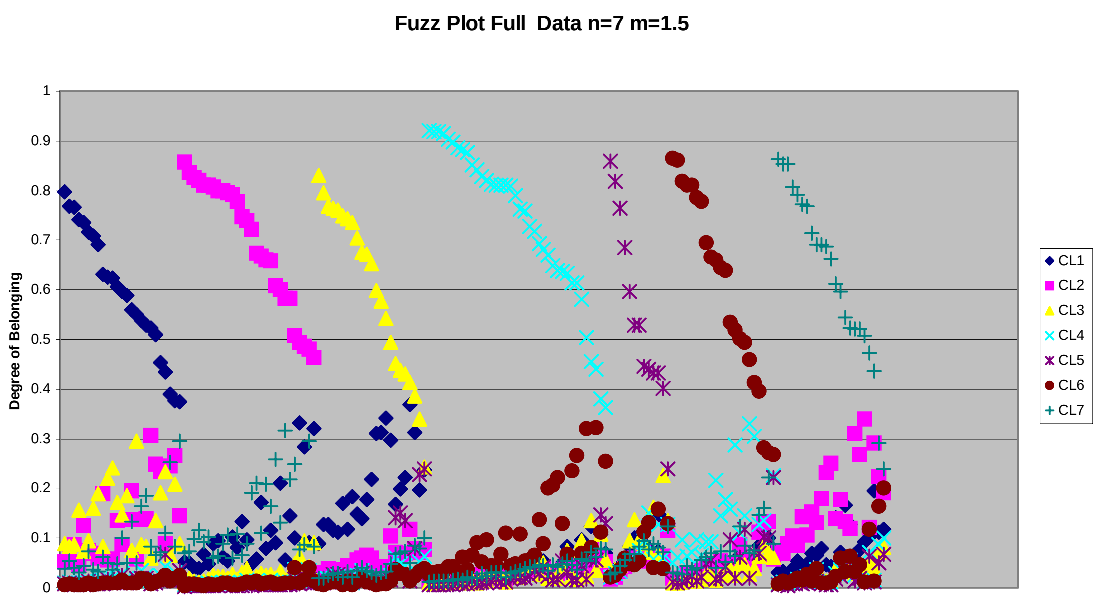



**Figure 4-3: Fuzz Plot of the Full Data Set with 7 Clusters and m = 1. 5**

### 4.5.3. Grouping the Observations into Clusters

In fuzzy clustering all observations belong to all clusters, although with varying degrees of belonging. In order to perform Data Envelopment Analysis, a cut off must be imposed based on the degree of belonging. This is needed to determine which observations can be assigned to their respective clusters for the local DEA evaluation. The cut off for this research is computed at 0.142857 (1/7) (average degree of belonging for a seven-cluster solution). Each observation will be assigned to those clusters for which it has a degree of belonging greater than or equal to the average degree of belonging. The choice of the cut off in this case was arbitrary; however, the average degree of belonging is intuitive. Such a cut-off (average degree of belonging) ensures that each observation will be assigned to at least one cluster. If an alternate cut-off is chosen, it should be such that each observation is assigned to at least one cluster. The choice of the average degree of belonging ensures that all municipalities have been assigned to at least one cluster.

An example of assignment of an observation to various clusters based on its degrees of belonging follows:

Consider observation 11, the degrees of belonging for which are given in Table 4-7 below. The Column DOB_i denotes the observation's degree of belonging to cluster i.

| **Obs** | **DOB_1** | **DOB_2** | **DOB_3** | **DOB_4** | **DOB_5** | **DOB_6** | **DOB_7** |
|---|---|---|---|---|---|---|---|
| 11 | 0.1983 | 0.0661 | 0.4391 | 0.0476 | 0.1502 | 0.0288 | 0.07 |

**Table 4-7: Degree of Belonging Across Clusters for Observation #11**

This observation has its primary degree of belonging to cluster 3 (DOB_3 = 0.4391), in addition to which, it is also assigned to cluster 1 (DOB_1 = 0.1983) and cluster 5 (DOB_5 = 0.1502) as it has degrees of belonging greater than or equal to the cut-off (0.142857) for these clusters too.

### 4.6. Representative Cluster Object

The medoids are the observations that have the least average distance with all the other observations within their cluster. The original medoid (one that is computed in the output of the clustering algorithm) is based on the closest hard solution to the fuzzy solution, which means that for the calculation of this medoid each observation was assigned only to one cluster for which it had the highest degree of belonging. Thus when the observations are re-assigned (as described in section 4.5.3) the original medoid (calculated as a part of the fuzzy clustering) no longer remains the true medoid. This brings up the need to calculate a new medoid for each cluster. The new medoids are computed based on the re-assignments. The following expression describes the medoid

$$\min_{i \in c} \frac{1}{n_c} \sum_{\forall j \in c} d(i, j) \qquad (4-1)$$

Where, $n_c$ is the number of observations in cluster c, d (i, j) is the distance between the ith and the jth observations in cluster c

The newly calculated mediods for the clusters are presented in Table 4.-8[5]. It should be noted at this point that the medoid, by definition, would always correspond to an actual DMU within the data set.

| Cluster | Obs # | Political | EXTREV | SEREXP | INVEST | INDEX |
|---|---|---|---|---|---|---|
| 1 | 137 | 1 | 123303 | 12840 | 107309 | 68. 3 |
| 2 | 58 | 1 | 52567 | 832 | 59687 | 85. 4 |
| 3 | 44 | 1 | 110483 | 8074 | 104873 | 39. 9 |
| 4 | 148 | 0 | 42826 | 11056 | 61834 | 69. 6 |
| 5 | 142 | 1 | 286484 | 47697 | 335683 | 71. 7 |
| 6 | 16 | 0 | 70917 | 9051 | 99699 | 84. 9 |
| 7 | 3 | 1 | 79260 | 16344 | 113479 | 90. 5 |

**Table 4-8: Medoids for the Clusters Calculated After Assigning All Municipalities to Clusters**

In order to analyze whether the medoid may be used as the representative object of the cluster, the mean vectors (i. e the means associated with each environmental variable) of the clusters for the environmental variables are compared with the values of the medoid. The mean vectors are presented in Table 4-9 on the following page.

[5] These calculations were performed in Microsoft Excel

| Cluster | Political | EXTREV | SEREXP | INVEST | INDEX |
|---|---|---|---|---|---|
| **1** | 1 | 113544 | 9412 | 118247 | 66. 0 |
| **2** | 1 | 71192 | 5981 | 73663 | 83. 4 |
| **3** | 1 | 126011 | 8473 | 120808 | 56. 8 |
| **4** | 0 | 68680 | 9015 | 85609 | 68. 0 |
| **5** | 0. 777778 | 438333 | 35537 | 452414 | 80. 0 |
| **6** | 0. 090909 | 91019 | 14647 | 113685 | 98. 3 |
| **7** | 0. 948718 | 98976 | 12102 | 114619 | 96. 7 |

**Table 4-9: Means of the Environmental Variables for clusters**

As seen from the table 4-9 above, the medoid that we treat as the representative object for the whole cluster matches very closely with the mean of the observations included in the cluster for the INDEX variable in all cases. The binary variable, POLITICAL is also captured faithfully by the medoid for all clusters. The variable EXTREV (Extra Ordinary Revenue) matches the mean in most cases except for cluster 5 where the mean is very high compared to the value for the medoid object. The medoids closely match the mean vector for the variable SEREXP, except for cluster 2 where the value of the medoid object is very low. The investment in infrastructure is also captured by the medoid for all clusters

In order to overcome the possible limitation that the medoid may not truly capture the environmental behavior of the cluster, we shall use an actual observation that is closest to the mean vector. The advantage of using this approach (as opposed to using the mean vector itself) is that we have an actual observation (DMU for DEA) that shall not alter the data set when considered for the data envelopment analysis. These observations (closest to the mean vector) and their environmental variable values are presented in Table 4-10.

| Cluster | Obs # | Political_ | EXTREV | SEREXP | INVEST | INDEXX |
|---|---|---|---|---|---|---|
| **1** | 137 | 1 | 123303 | 12840 | 107309 | 68. 3 |
| **2** | 46 | 1 | 68557 | 1132 | 73878 | 90. 2 |
| **3** | 68 | 1 | 134725 | 8524 | 125331 | 66. 9 |
| **4** | 16 | 0 | 70917 | 9051 | 99699 | 84. 9 |
| **5** | 63 | 1 | 351919 | 35014 | 521460 | 90. 1 |
| **6** | 32 | 0 | 100496 | 4291 | 115856 | 79. 3 |
| **7** | 3 | 1 | 79260 | 16344 | 113479 | 90. 5 |

**Table 4-10: DMUs that are Closest to the Mean Vectors of the Cluster**

By definition and as seen in table 4-10 the object closest to the mean captures the mean behavior of the cluster in terms of the environmental variables.

### 4.6.1. Discussion on the Choice of the Representative Object

It may be argued that by changing the representative object we are violating the objective function of the fuzzy clustering algorithm used (because the optimization has taken place based on certain representative object). It should be borne in mind at this point that the use of fuzzy clustering was only to facilitate a homogeneous grouping of DMUs based on their environmental variables, such that a DMU could possibly belong to more than one cluster. We shall present results using both the medoid, which is an observation that has the least average distance to all other observations in the cluster and the 'minimum distance from the mean' observation in this context.

## 4.7. Summary of the Clustering Results

We found that 7 clusters with the value of fuzzifier set at 1.5 yield an appropriate clustering solution for the subsequent DEA analysis. It should be noted that as mentioned in Section 3.4 the selection of a good fuzzy clustering solution is an inexact science and some degree of subjectivity will be present in any choice that is made. This research primarily focused on using the indices (Dunn's and Kaufman), silhouette and the fuzz plots to obtain reasonable solutions. The clusters formed after re-assignment of observations based on the degree of belonging and the cut-off, the clusters are mostly of similar size, except for cluster 5, which is the smallest cluster with only 18 observations assigned to it. The number of observations assigned to each cluster is shown in Table 4-11. If the cluster size obtained by the analyst is not sufficient to carry out a DEA analysis, one may choose to use analysis by dominance or some other frontier based method such as free disposable hull.

| Cluster | # Observations assigned |
|---|---|
| **1** | 50 |
| **2** | 47 |
| **3** | 37 |
| **4** | 48 |
| **5** | 18 |
| **6** | 33 |
| **7** | 39 |

**Table 4-11: Number of Observations Assigned to Each Cluster**

In order to analyze the composition of the clusters and to understand the classification generated using the approach described in this thesis, one-way analysis of variance (using NCSS™ software's Analysis of Variance tool) is carried out. Each environmental variable was considered a factor in this analysis. Since this is a multiple comparison test, the alpha for the test was set to 10% and 15%. Analysis of variance was limited to the 4 continuous variables that were described in Section 4.2.3. The Kruskal-Wallis testing procedure was chosen, as it is a non-parametric approach with no requirement on the distribution of the variables within the clusters. The Kruskal-Wallis test is rank test that has the null hypothesis that the medians of the two populations are equal. Since this test is based on the ranks rather than means it is fairly robust. Complete results of the tests are presented in the AppendixA-4.7. The visual representation of the results is presented in table 4-12 on the following page.

| Extrev | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|
| 1 | 0 | x | ` | x | x | ` | ` |
| 2 | x | 0 | x | ` | x | ` | x |
| 3 | ` | x | 0 | x | x | x | ` |
| 4 | x | ` | x | 0 | x | ` | x |
| 5 | x | x | x | x | 0 | x | x |
| 6 | ` | ` | x | ` | x | 0 | ` |
| 7 | ` | x | ` | x | x | ` | 0 |

| Invest | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|
| 1 | 0 | x | ` | x | x | ` | ` |
| 2 | x | 0 | x | ` | x | x | x |
| 3 | ` | x | 0 | x | x | ` | ` |
| 4 | x | ` | x | 0 | x | x | x |
| 5 | x | x | x | x | 0 | x | x |
| 6 | ` | x | ` | x | x | 0 | ` |
| 7 | ` | x | ` | x | x | ` | 0 |

| SerExp | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|
| 1 | 0 | x | ` | ` | x | ` | ` |
| 2 | x | 0 | ` | ` | x | x | x |
| 3 | ` | ` | 0 | ` | x | x | x |
| 4 | ` | ` | ` | 0 | x | x | x |
| 5 | x | x | x | x | 0 | x | x |
| 6 | ` | x | x | x | x | 0 | ` |
| 7 | ` | x | x | x | x | ` | 0 |

| Index | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|
| 1 | 0 | x | x | ` | x | x | x |
| 2 | x | 0 | x | x | ` | x | x |
| 3 | x | x | 0 | x | x | x | x |
| 4 | ` | x | x | 0 | x | x | x |
| 5 | x | ` | x | x | 0 | x | x |
| 6 | x | x | x | x | x | 0 | ` |
| 7 | x | x | x | x | x | ` | 0 |

Table 4-12: Visual representation of the Kruskal-Wallis Test (10%level)

In table 4-12 the '**X**' represents that the medians were statistically not same at the 10 % level and the tildes (`) represent that the null hypothesis could not be rejected at the same confidence level.

As observed from table 4-12 above, the binary variable POLITICAL plays a big role in making the two primary partitions. Clusters 1, 2 and 3 consist of DMUs that have local municipalities (LM) that are governed by the party that forms the central government. Within this subset of three clusters, cluster 2 differs significantly from 1 and 3 in terms of the EXTREV variable at the 10% significance level. This is particularly interesting, as even though the political party in charge of the LM is the same, Cluster 2 has very low income from Extra-ordinary governmental grants.

Clusters 5 and 7 mostly consist of municipalities that have same political party as the central government. Cluster 5 differs significantly with all clusters in terms of the EXTREV variable. Cluster 5 has some LMs with very high values of this variable. This cluster seems to consist of some fairly powerful LMs that can exert their influence over the government for extra-ordinary grants. Cluster 7 differs only with 5, 4, and 2 in terms of the EXTREV variable. Cluster 4 is a unique cluster as it consists of only those LMs that are governed by parties that differ from that of the central government; this is also evident from the least mean value of the extra-ordinary grants from the government for this cluster. This cluster median is significantly different (not same) from median EXTREV values in cluster 1, 3, 5 and 7 at 10 percent level and it is significantly different from cluster 6 at the 15 percent significance level.

It is interesting to note here that we have identified two clusters that behave significantly differently from the others in terms of the EXTREV variable; cluster 2 and cluster 4 and both have different parties ruling them. Both the clusters have a very low mean value for the extraordinary grants received from the governments. Consider, now, the investment in infrastructure across the clusters. Cluster 1 significantly differs from clusters 2, 4 and 5. Cluster 2 differs significantly from all others except cluster 4. Cluster 5 differs significantly from all other clusters with regards to investment in infrastructure. Cluster 2 and 4 again display the behavior that they are similar with respect to this variable; however differ in the parties governing them.

In terms of the Service Expenditure (SEREXP) Cluster 1 differs significantly from clusters 2 and 5. In addition to cluster 1, cluster 2 differs significantly from clusters 5, 6 and 7. Cluster 3 differs significantly from clusters 5, 6 and 7. Clusters 6 and 7 differ from all other clusters except between themselves. It can be seen that clusters 6 and 7 are very similar to each other in all other aspects except for the political party governing the local municipality. Cluster 7 mostly consists of LMs that have the same ruling party as the center, whereas cluster 6 mostly consists of LMs having the opposition party. All clusters are different significantly for the fees and charges index variable except the following pairs, 1 and 4, 2 and 5, and 6 and 7.

In summary, we observe that cluster 5 is has very high mean extra ordinary income from government and also very high investment in infrastructure with reasonably low value of service expenditure. Cluster 2 on the other had has a very low value of extraordinary income from the government low service expenditure and low value of investment in infrastructure. Cluster 4 behaves similar to cluster two in terms of having low values across all variables in addition to having a low value for the fees and charges index. In this it differs from cluster 2. Cluster 6 exhibits the highest average value of fees and charges index along with high value of service expenditure and low value of extraordinary income from the government. The clustering results are summarized in Table 4-13 in terms of high medium and low values for environmental variables below

| Cluster | Political | EXTREV | SEREXP | INVEST | INDEX |
|---|---|---|---|---|---|
| 1 | 1 | Medium/low | Medium | Medium | Low |
| 2 | 1 | Low | Low | Low | Medium |
| 3 | 1 | Medium | Low | Medium/low | Low |
| 4 | 0 | Low | Low | Low | Low |
| 5 | 1 | High | High | High | Medium/low |
| 6 | 0 | Low | Medium/low | Medium | High |
| 7 | 1 | Low | Medium | Medium | High |

**Table 4-13: Summary of Clustering Results**

The reader should note that this clustering scheme is not the only one that is possible within the context of partitioning data using the environmental variables. However the clustering solution chosen does give us clusters that are significantly different along the several environmental variables as shown by the Kruskal-Wallis test. The strength of the fuzzy clustering approach is in the fact that even though we have clustered the data points several DMUs belong to more than one group, thus exerting their influence in the relative efficiency analysis.

### 4.8. The DEA Results

The following sections describe the results obtained by using a non-radial model for Data Envelopment Analysis. The non-radial model appears to be more intuitive with regards to the improvements suggested. The changes suggested by the non-radial model for improvement are in different proportions for different variables as opposed to suggestions in a radial model where each variable is presumed to change in the same proportion. Thus the non-radial model reflects real world situations more closely.

The data used for DEA is shown in the Appendix A-4.8 along with the results obtained.

For the global analysis the non-radial DEA was performed considering all the DMUs (172) without considering their environmental variables. Non-radial DEA was also performed for each cluster using only the DMUs assigned to each cluster, this is referred to as the local analysis.

For the following part of this section we shall use the term **'the paper'** in reference to Athanassopoulos and Triantis (1998).

We present a comparison of the DEA results obtained in this research to those presented in **the paper.**

For the global relative efficiency analysis using a variable returns to scale non-radial model, 31 units were deemed efficient compared to 24 in **the paper**. Of these 23 units are common in both the approaches. One DMU that was deemed efficient in the paper is inefficient in the new approach is observation 125, which has a relative efficiency of 0. 847. It should also be noted that this DMU does belong to the frontier of cluster 4. The approach shown in this research classifies 8 DMUs on the global frontier that **the paper** does not. These municipalities do not seem to belong to any specific cluster, and hence it is not possible to make a statement about any specific characteristics of these municipalities.

Cluster 1 has 24 units deemed efficient in the local analysis; these units form the local frontier. Of these 24 units, 7 belong to the global frontier. Cluster 2 has 19 units that are deemed efficient within the cluster, of which 6 are a part of the global frontier. Cluster 3 has 13 relatively efficient DMUs with 7 also belonging to the global frontier. The other 6 DMUs that are a part of the local frontier, but not are not on the global frontier are relatively efficient in other clusters that they belong to. For example, observation 2 is also on the frontier of cluster 1 and observation 130 is also efficient in cluster 5. Cluster 4 has

18 DMUs that are relatively efficient of which 11 belong to the global frontier. For Cluster 5, the smallest cluster, 12 out of its 18 DMUs are deemed locally efficient and 6 of these are also a part of the global frontier. It should be observed that Cluster 5 has 6 globally efficient DMUs from its total of 18, which is a very high percentage compared to all other clusters and a close second in this metric is cluster 4 which has 11 DMUs that are efficient globally out of its total of 48. Table 4-14 presents the count of observations that are relatively efficient within each cluster and also the number of globally efficient units belonging to them.

| Cluster | Locally efficient units | Globally Efficient Units present |
|---|---|---|
| Cluster1 | 24 | 7 |
| Cluster2 | 19 | 6 |
| Cluster3 | 13 | 8 |
| Cluster4 | 18 | 11 |
| Cluster5 | 12 | 6 |
| Cluster6 | 18 | 5 |
| Cluster7 | 19 | 5 |

**Table 4-14: Number of Local and Global efficient units in each cluster**

All clusters contain at least 5 of the globally efficient units within them with cluster 4 containing 11 such units. It should be noted here that cluster 3 contains an observation that is deemed efficient in the global analysis, however its local efficiency is below one. This is possible due to the reduction of the production possibility set which causes the problem to be less constrained. This may allow another DMU, which was not previously efficient (in the global analysis) to be efficient, there by superseding the DMU relatively in the local analysis. This is shown by the fact that one of the DMUs in the reference set of this DMU was not efficient in the global analysis (DMU130). This DMU has a relative efficiency of 0.88 in the global analysis. The summary of DEA results in categorical terms (high, medium and low) are presented in table 4-15 below

| Cluster | Political | EXTREV | SEREXP | INVEST | INDEX | Efficiency |
|---|---|---|---|---|---|---|
| 1 | 1 | Medium/low | Medium | Medium | Low | High |
| 2 | 1 | Low | Low | Low | Medium | Low |
| 3 | 1 | Medium | Low | Medium/low | Low | Low |
| 4 | 0 | Low | Low | Low | Low | Medium |
| 5 | 1 | High | High | High | Medium/low | High |
| 6 | 0 | Low | Medium/low | Medium | High | High |
| 7 | 1 | Low | Medium | Medium | High | Medium |

**Table 4-15: Summary Cluster Results**

The efficiency column in table 4-15 is based on the mean efficiency of the clusters excluding the units on the frontier. This was done in order to avoid the clusters having a large proportion of their units in the frontier being seen as very efficient and clouding the ranking into high medium and low

### 4.8.1. Representative Object

The relative efficiencies of the decision-making units represent the distance from the efficient frontier. In order to represent the notion of efficiency for a cluster as a whole we attempt to use the nearest DMU to the mean of the environmental variable vector and the medoid. Results using two different choices for the representative object, the medoid of the cluster, and the observation closest to the mean of the environmental variables are presented in Table 4-16 below.

| | Cluster1 | Cluster2 | Cluster3 | Cluster4 | Cluster5 | Cluster6 | Cluster7 |
|---|---|---|---|---|---|---|---|
| **Relative VRS Local Efficiency of Closest to mean obs** | 0.95 | 0.32 | 0.24 | 0.67 | 0.98 | 0.75 | 1 |
| **Relative Local Efficiency of the Medoid** | 0.95 | 0.29 | 0.57 | 0.59 | 1 | 0.64 | 1 |
| **Mean VRS Efficiency of the Cluster** | 0.83 | 0.74 | 0.77 | 0.77 | 0.88 | 0.85 | 0.79 |
| **Median VRS Efficiency of the cluster** | 0.98 | 0.74 | 0.78 | 0.83 | 1 | 1 | 0.91 |
| **Global VRS Efficiency of closest to mean** | 0.45 | 0.3 | 0.22 | 0.43 | 0.43 | 0.71 | 0.57 |
| **Global VRS Efficiency of medoid** | 0.45 | 0.28 | 0.51 | 0.55 | 0.18 | 0.43 | 0.57 |

**Table 4-16: Results of the Representative Observations (observation closest to mean and the medoid)**

The above table presents the relative efficiency of the representative object (medoid and the observation closest to the mean). The mean and median relative efficiencies of the clusters are also presented for comparison. The global efficiencies of the representative observations are also presented. Clusters 2 and 3 are the ones in which the mean or the median of the cluster differs greatly from the relative efficiency of the representative DMU. Both, the medoid and the observation closest to the mean, track the mean efficiency of the clusters except for clusters 2 and 3.

It is not conclusive which choice of representative object faithfully captures the efficiency structure of the cluster. It should be pointed out that this might not be the only way to choose a representative object from a cluster. The representative object of the cluster may allow the policy maker to use a single DMU as an abstraction of the whole cluster and base the decisions that would be applicable to the whole cluster on such an abstraction. It may also be difficult to associate efficiency with the mean environmental behavior. The lack of knowledge about the functional dependence of the relative efficiency on the environmental behavior increases the challenge to find a representative object that captures, both the environmental behavior and also the efficiency behavior of the cluster.

It should be noted that the average efficiency in cluster 5 is the highest; this may tie back to the fact pointed out in Section 4.6 regarding this cluster having influencing power over the policy makers. Cluster 2 on the other hand produces the least mean relative efficiency; this can also be noted from Section 4. 6 where in the summary we note that despite having the central ruling party as the local government, the LMs in this cluster are not well taken care of by the decision makers. A detailed analysis may be undertaken to exactly find the reasons for such behavior.

In the overall (global) analysis the average relative efficiency of the LMs is about 60%. It should also be noted that as expected the efficiency of the observations during the local DEA evaluation is higher compared to the relative efficiencies computed in the global analysis. A simple paired t-test carried out and presented in Appendix A-4.9 shows this result.

### 4.8.2. Peers

In the global VRS analysis DMU 81 figured in the reference set of 80 other DMUs this is almost half of all the DMUs considered in the analysis. It should be noted that the above mentioned DMU, DMU 81 which is a part of clusters 2 and 7 also features as the DMU that appears most often in the reference set of other DMUs within the two clusters (cluster 2 and 7). Thus DMU 81 exerts its influence on most DMUs, when it is considered in the analysis, either locally or globally.

DMU 131 appears in the reference set of 72 other DMUs in the VRS global analysis. This DMU is a part of clusters 4 and 5. Within clusters 4 and 5 this DMU is the one that is featured the most in reference sets of other DMUs. This DMU is a peer to 25 DMUs in clusters 4 and 6 DMUs in cluster 5.

The behavior of DMU 103 is interesting as it is inefficient in the global analysis; however, it appears most often in the reference sets of other DMUs in cluster 1. This DMU appears as a peer of 23 other DMUs within cluster 1. Along with DMU 131, DMU 26 also features as the DMU that is most featured as a peer in cluster 4. This DMU is featured 66 times as a peer of other DMUs in the global analysis.

Cluster 1 has DMU 103 featuring in the reference set of most other DMUs within the cluster. However, it is inefficient in the global analysis, where as those DMUs that are relatively efficient in the global analysis and also feature in cluster 1 feature in reference sets of fewer DMUs. For example consider observation 51 which features 21 times as a peer in the global analysis, and only 11 times in cluster 1. Such a behavior is possible as the problem in a clustered environment is less constrained (fewer DMUs). This allows relatively lesser efficient DMUs to move to the frontier and exhibit their influence within the cluster. In the global analysis DMU 103 has as its peers DMUs 26, 81 and 131, which are very strong DMUs as can be seen from Table in Appendix A-4.10. These DMUs act as constraints in the global analysis for DMU 103.

Another such cluster is cluster 6. The DMU that appears most frequently in the reference set of other DMUs within this cluster is DMU 109, which is a peer only for 8 other DMUs in the global analysis. This can again be explained as the linear programming problem within the clusters is significantly less constrained thus allowing weaker DMUs to exhibit their influence.

The analysis considered here attempts to provide the decision maker a two-stage approach that would allow individual DMUs to have multi stage improvement plans. An example of such a two-stage improvement strategy is described below

Consider DMU 1 in cluster 1; its peers are {10, 99, 103, and 113}. The local relative efficiency of this observation is 42%. The global relative efficiency for this observation is 26%. Consider again for the sake of simplicity that this DMU changes its processes such that it can emulate DMU 10 exactly (this of course may not be possible), then DMU 1 will be efficient locally. However it will still require implementation of additional changes to be efficient irrespective of the environment, i. e., in the global analysis. This means that DMU 1, which is inefficient locally should look up to the local peers first for improvements in order to reach the local frontier, i.e., to be efficient relative to the DMUs that operate in a similar environment as itself. After this improvement has been implemented (DMU 1 emulates the processes of DMU 10 completely), if the decision maker deems that additional changes are necessary for the DMU to further improve its processes, the global peers at that stage (after the DMU moves to the local frontier, DEA would have to be re-performed) may give the necessary information. In this example the peers of DMU 10 {26, 81, 89, 121, 153} in the global analysis would give information for DMU 1 (since the processes for DMU 1 were changed such that it would emulate DMU 10).

### 4.8.3. Environmental Dependency Index

While using the two-stage approach to carry out the relative efficiency evaluation for a set of decision-making units, it may be important to look at the effect of classification (clustering) on the evaluation. The units may have different local efficiencies depending on the clusters that they are assigned to in the first stage.

The environmental dependency index is presented to allow an analyst to quantify such an effect. Environmental Dependency Index (EDI) is defined as the ratio of the local efficiency to the global efficiency. It is intended that the EDI convey the extent of dependency of the relative efficiency of the unit on its environment. High value of EDI shows the unit has higher relative efficiency locally compared to the global analysis, this may indicate that its environment of operation suppresses operation of such a unit. If however the relative efficiency analysis is carried out among units that operate in a similar environment then the unit has a fairly efficient operation.

The units with low value of EDI are the ones that have the same (or almost) similar evaluation globally or locally. However the units with higher values of EDI are dependant on being classified in homogeneous groups for evaluation. Thus the EDI shows the extent to which such units can be portrayed under a better light in a relative efficiency analysis once they are grouped into a cluster of homogeneous units. The tables consisting of the EDI for the LMs is presented in Appendix A-4.11.

Consider DMU 172, its EDI based on the cluster 3 results is 0.93. This implies that its efficiency in the global analysis was higher than that in the local analysis, however the point to be noted is that it is close to one and hence the DMU exhibits the same kind of efficiency performance globally or locally. On the other hand consider DMU 37, which has a high value of EDI based on cluster 1 and lower values based on cluster 2 and cluster 7 efficiencies. This DMU is presented in its best light when compared to other units operating in an environment described by cluster 1, however the same unit when compared with units in different clusters has a much lower relative efficiency. It should also be noted that this unit has its primary degree of belonging to cluster 1 and has low degrees of belongings to cluster 2 and 7. There may be a relation between how strongly a unit belongs to a cluster and how its environmental dependency index behaves, however that is an area of further research.

Based on this research and the method described, the following can be evaluated for a local municipality. The analysis will describe how dependent the relative efficiency is on the operational environment. The method will suggest a two-stage improvement approach to the decision maker. The first stage of the improvement process is based on the local relative efficiency and the second stage on the global relative efficiency. The decision maker must set targets such that DMUs within each cluster strive to achieve the local frontier. The decision maker may choose to alter the production processes of the DMUs based on the local analysis. This provides for a short to medium term strategy to enable all DMUs within a similar environment to overcome their local inefficiencies and be relatively efficient. The decision maker may then choose to perform strategic improvement over a longer period of time based on the suggestions made by the global analysis to attain more globally efficient units.

# 5. Alternate Clustering Solution

Successful evaluation of relative efficiencies using the two-stage framework proposed in this thesis depends on the validity of the clustering results obtained in stage one. If the clusters obtained in the first stage do not partition the data correctly based on their environments, the subsequent local efficiency analysis would be invalid. Utmost care must be taken during the first stage (clustering) to obtain clusters of units operating in similar environments, which are, are statistically rigorous.

The output from principal component analysis in most commercial software is scaled to have a mean of zero and standard deviation of one, i.e., standardized. If the principal component factors are used without any transformation, as they are in chapter 4, each factor exerts the same amount of influence in the clustering stage. The methodology followed in this chapter adjusts for such a scaling by multiplying each factor by the square root of its Eigen value; these scaled factors now exert a varying amount of influence in the clustering stage based on the variance in the original variable space.

In this chapter, we present the fuzzy clustering results obtained by using a statistically more rigorous series of steps as compared to chapter 4. In order to explain the differences between the two methods, the sequence of steps followed in both cases are tabulated below in table 5-1.

| **Steps Followed In Chapter 4** | **Steps Followed in Chapter 5** |
|---|---|
| 1. Robust Principal Component Analysis performed using the complete dataset | |
| 2. Data Split into two: Training and Holdout sample | 1. Data Split into two: Training and Holdout sample |
| | 2. Robust Principal Component Analysis performed using the training sample |
| | 3. Standardization of the factors obtained from the robust principal component analysis |
| | 4. Scaling of the standardized factors (multiplying by square-root of the eigen value of each factor) |

| Steps Followed In Chapter 4 | Steps Followed in Chapter 5 |
|---|---|
| 3. Fuzzy clustering performed on the factors for the training sample | 5. Fuzzy clustering performed on the **scaled** factors for the training sample |
| | 6. Robust Principal Component Analysis performed using the holdout sample |
| | 7. Standardization of the factors obtained from the robust principal component analysis |
| | 8. Scaling of the standardized factors (multiplying by square-root of the eigen value of each factor) |
| 4. Fuzzy clustering performed on the factors for the holdout sample to validate the clustering solution obtained from the training dataset | 9. Fuzzy clustering performed on the **scaled** factors for the holdout sample to validate the clustering solution obtained from the training dataset |
| | 10. Robust Principal Component Analysis performed using the holdout sample |
| | 11. Standardization of the factors obtained from the robust principal component analysis |
| | 12. Scaling of the standardized factors (multiplying by square-root of the eigen value of each factor) |
| 5. Fuzzy clustering performed on the factors for the complete dataset using the parameters obtained from training samples (validated by holdout) | 13. Fuzzy clustering performed on the **scaled** factors for the complete dataset using the parameters obtained from training samples (validated by holdout) |
| 6. Applying the cut-off to the data | 14. Applying the cut-off to the data |
| 7. Perform the KW Test to validate the clusters in terms of the original variables | 15. Perform the KW Test to validate the clusters in terms of the original variables |

**Table 5-1: Comparison of methods followed in chapter 4 and chapter 5**

As seen from table 5-1 above, in chapter 4 the robust Principal Component Analysis was performed once initially, and the training and the hold out samples were chosen after the principal component analysis was completed. The factor scores obtained from the robust PCA were used directly in the fuzzy clustering algorithm without adjustments. As mentioned earlier, this would lead to each factor exerting the same influence as the others in the clustering procedure.

In the methodology followed to arrive at the clustering results presented in this chapter, the training sample and the holdout sample were created prior to performing the principal component analysis. Robust Principal Component Analysis was performed for each of these samples separately. The factors obtained from the robust principal component analysis were adjusted for the variance present in the original variable space.

The robust principal component analysis output from NCSS™ does not yield standardized factors. This is due to the robust estimators for the mean and the variance by the NCSS™ software. The factors obtained from the robust principal component analysis from the NCSS™ software were standardized in standard spreadsheet software. These standardized factors were multiplied by the square root of the Eigen values for each factor to adjust for the variance present in the original variables space. This is done to ensure that each adjusted factor exerts a varying amount of influence in the clustering procedure. The influence exerted by each adjusted factor is dependant on the variance in the original variable space. The principal component analysis results are presented in Appendix A5-1. The top three factors selected, explain about 85 % of the variance structure in the data. The cut off for the factors was based on the Eigen values and was chosen as 0. 7. The cut off chosen in this case is acceptable in the literature and is proposed by Joliffe (1972). The data used for clustering is presented in Appendix A5-2.

## 5.1. Summary of the Clustering Results

The solution chosen consisted of 5 clusters with a fuzzifier value of 1.5. As mentioned in Section 3.3, selection of a good fuzzy clustering solution is an inexact science and some degree of subjectivity will be present in any choice that is made. As pointed in Section 4.6, this research primarily focused on using the indices (Dunn’s and Kaufman), silhouette and the fuzz plots to obtain reasonable solutions. The steps followed to choose the final clustering solution are the same as in chapter 4. As 5 clusters are formed in this case, the cut-off is calculated to be 0.2 (1/5). The clusters formed after assigning the observations whose degree of belonging to that cluster was greater than the average degree of belonging (1/5), are mostly of similar size, except for cluster 5, which is the smallest cluster with only 39 observations assigned to it. The number of observations that are assigned to each cluster are shown in Table 5-2

| Cluster | Number of observations |
|---|---|
| 1 | 49 |
| 2 | 57 |
| 3 | 48 |
| 4 | 55 |
| 5 | 39 |

**Table 5-2: Number of Observations Assigned to Each Cluster**

In order to analyze the composition of the clusters and to understand the classification generated using the approach mentioned thus far, one-way analysis-of-variance is performed using NCSS™ software's Analysis of Variance tool. Kruskal-Wallis testing procedure was chosen, as it is a non-parametric approach with no requirement on the distribution of the variables within each cluster. Analysis of variance was limited to the 4 continuous variables as noted in Section 4.2. As this is a multiple comparison test, the alpha for the test was set to 10% and 15%. Similar to the section 4.6 the null hypothesis is that the medians of the two populations are equal. Full results of the tests are presented in the Appendix A5-3. The summary results given below. The 'X' denotes that the null hypothesis was rejected at the 10 % level (medians are not the same) and the tildes represent that the null hypothesis could not be rejected at the same confidence level. For example, consider the variable SEREXP; there is 'X' in the first column of the fourth row. This denotes that the medians of the SEREXP variable for clusters 1 and 4 are statistically not the same at the 10% level.

| SEREXP | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| 1 | | ~ | ~ | X | X |
| 2 | ~ | | ~ | X | X |
| 3 | ~ | ~ | | X | X |
| 4 | X | X | X | | ~ |
| 5 | X | X | X | ~ | |

| INVEST | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| 1 | | X | X | X | X |
| 2 | X | | ~ | X | X |
| 3 | X | ~ | | X | X |
| 4 | X | X | X | | ~ |
| 5 | X | X | X | ~ | |

| EXTREV | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| 1 | | X | X | X | X |
| 2 | X | | X | X | X |
| 3 | X | X | | X | X |
| 4 | X | X | X | | ~ |
| 5 | X | X | X | ~ | |

| INDEXX | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| 1 | | X | X | X | X |
| 2 | X | | X | ~ | X |
| 3 | X | X | | X | X |
| 4 | X | ~ | X | | ~ |
| 5 | X | X | X | ~ | |

**Table 5-3: Visual representation of the Kruskal-Wallis Test (10%level)**

The variable POLITICAL makes the primary division in the data. Clusters 1, 2, 4 consist of Local Municipalities (LM) which have the same party governing them as the central government (i.e, the variable POLITICAL has a value of 1). It is interesting to note from table 5-3 above that clusters 4 and 5 do not differ significantly in all the four continuous variables, yet are identified as different clusters during the clustering phase. This is due to the difference in the variable POLITCAL. Cluster 4 comprises of only those LMs for which the governing party is the same as the central government. Cluster 5 on the other hand contains mostly of the LMs that are governed by parties different from the central government. Clusters 4 and 5 have high values for all variables as seen in table 5-4. Cluster 2 on the other hand has a low average value for all variables. Cluster 1, 2 and 3 do not differ significantly in terms of the Service expenditure (Variable: SEREXP). Clusters 1,2 and 3 differ significantly at the ten percent level in terms of Extra-ordinary governmental grants (Variable: EXTREV). Cluster 3 gets the least Extra-ordinary governmental grants, which may be explained in part by it being governed by a party that is different from the party at the central level. Clusters 4 and 5 have some LMs with very high values EXTREV. These clusters seem to consist of some fairly powerful LMs that can exert their influence over the ruling government for extra-ordinary grants.

| Cluster | SEREXP | EXTREV | INVEST | INDEX |
|---|---|---|---|---|
| 1 | Medium | Medium/low | Medium | Low |
| 2 | Low | Low/medium | Low | High/medium |
| 3 | Low | Low | Low | Medium |
| 4 | High | High | High | High/medium |
| 5 | High | High | High | High |

**Table 5-4: The averages of the variables in Qualitative terms**

In summary, we observe that cluster 5 has a high value for all the variables. It can be associated with a cluster of municipalities that operate on a large budget and are relatively important to receive the extra governmental grants. Cluster 3 on the other hand has low values across the board and seems to contain LMs that have fewer resources and smaller budgets.

The reader should note that this clustering scheme is not the only one possible within the context of portioning data using the environmental variables. However, the clustering solution that has been chosen does give us clusters that are different along the several environmental variables as shown by the Kruskal-Wallis test. The strength of the fuzzy clustering approach is that even though we have clustered the data points several DMUs belong to more than one group, thus exerting their influence in the relative efficiency analysis.

The migrations of the observation between the two clustering solutions are presented in Table 5-5. It is important to note that the two clustering solutions are quite different as observations have migrated more or less uniformly across the clusters obtained in this chapter. The migrations were calculated using only the primary degree of belonging and give a good idea about the main movement of the observations between clusters. The prefix OLD refers to the clustering solution obtained in chapter 4 while the prefix NEW refers to the clustering solution presented in this chapter. The number denotes the cluster numbers. For example, 4 observations that had their primary degree of belonging to OLD cluster 1 (as calculated in chapter 4) now have a primary degree of belonging to NEW cluster 2 (as obtained as results in this chapter)

| | TO | | | | | |
|---|---|---|---|---|---|---|
| **FROM** | **NEW 1** | **NEW 2** | **NEW 3** | **NEW 4** | **NEW 5** | **Total** |
| **OLD 1** | **7** | **4** | **7** | **6** | **1** | **25** |
| **OLD 2** | **5** | **7** | **8** | **4** | **4** | **28** |
| **OLD 3** | **4** | **1** | **8** | **6** | **4** | **23** |
| **OLD 4** | **5** | **9** | **10** | **9** | **5** | **38** |
| **OLD 5** | **3** | **1** | **2** | **2** | **5** | **13** |
| **OLD 6** | **6** | **8** | **4** | **1** | **3** | **22** |
| **OLD 7** | **3** | **6** | **5** | **5** | **4** | **23** |
| **Total** | **33** | **36** | **44** | **33** | **26** | |

**Table 5-5: The migration pattern between the two clustering solutions**

This chapter is presented to show that more rigorous methods may be used to cluster the DMUs into groups having more homogeneity in terms of their operating environment. The chapter underscores the importance of assumptions made during the analysis, which can lead to different results and thus affect the subsequent relative efficiency analysis. Once appropriately clustered these LMs can then be evaluated using the DEA method.

# 6. Conclusions

The presence of non-discretionary variables or environmental variables can introduce difficulties while performing relative efficiency analysis using DEA. The research presents a two-stage approach for performing relative efficiency analysis at the same time accounting for the environmental variables. The approach presented in this research does not impose a convexity constraint on the environmental variables by forcing them at a constant level in the linear program as in the approach proposed by Banker and Morey (1986). The framework also does seek to define the harshness of the environment of operation as long as the decision-making units are compared with the other decision-making units in a similar environment. The approach presented in this research is particularly useful when there are several environmental variables present. The method presented avoids having to complete a stage based on regression techniques. Regression base techniques make assumptions about, or ignore, the distribution or the data generating process that gives rise to the environmental variables, a concern expressed by Simar and Wilson (2003). The methodology presented in this research does not make any assumptions about, nor does it ignore, the underlying data generation process. The ability of this approach to deal with such issues lies in its simplicity and the use of non-parametric techniques during the first stage to account for the environmental variables. The fuzzy clustering approach used allows the decision-making unit to be a part of more than one cluster during the second stage of relative efficiency analysis.

The environmental dependency index (EDI) presented for the first time in this research is a useful measure for assessing a particular DMU's true performance. The EDI can identify the extent to which the performance perception is due to the environment of operation for each DMU. Another use of EDI is that it gives the decision maker additional information about units that serve as a benchmark to under performing units within the cluster. Decision maker may choose DMUs that are not only locally efficient (on the frontier) but also have a high efficiency score in the global analysis to provide target or benchmarks to the under performing units within a cluster. In other words the DMUs with a EDI closer to unity may be able to serve as appropriate benchmarks or set better targets for the under performing units within a cluster.

The two-stage framework presented in this thesis also prescribed a two-stage improvement plans for the DMUs. The decision-maker can use the suggestions provided by the local frontier in order to change the DMUs such that they are at least as good as other DMUs operating in a similar environment. The global frontier helps the decision-maker assess the strategic changes needed for DMUs to improve without regards to the environment.

The two-stage framework is particularly sensitive to the quality of clustering solution. As seen from Chapters 4 and 5, the clustering solution may be completely different depending on what assumptions are made and whether statistically correct procedures are followed. The clustering results described in Chapter 5 differ from those that were used to carry out the efficiency evaluations as different approaches were used in both cases to arrive at a clustering solution. The results in chapter 5 should be considered to give statistically stronger results.

A comparison with Athanassopoulos and Triantis (1998) showed that both researches answer two fundamentally different questions. "How can one be fair in comparing diverse DMUs?" was answered in this research. Whereas, the above-mentioned research tries to answer the question of how the policy decisions impact the operation of the DMUs.

Relative efficiency analysis was carried out using both the variable returns to scales and constant returns to scale models. The results of the VRS are presented in Chapter 4 and the results obtained using the CRS model are presented in the Appendix A4-12

## 6.1. Some Issues for further Study:

The issue of selecting a good clustering solution is a non-trivial one. The quality or the 'correctness' of the second stage of relative efficiency analysis depends on the first stage classification. The first stage must be performed such that it is valid and statistically rigorous. There is some subjectivity involved when selecting a good clustering solution. This research presents guidelines about choosing a clustering solution; however, it still requires computation and analysis of multiple indices along with the fuzz plots. Thus, there may be disagreement among different analysts about the clustering solution for the same problem. An improvement of the method to obtain a clustering solution would help the two-stage approach presented here.

An additional step may be included to detect outliers or extreme observations. Fuzzy clustering may be used to determine such observations (Seaver and Triantis, 1999). Such observations can then be grouped and compared to one another either using DEA, or if the group is small, using a dominance-based approach.

The robust principal component analysis should converge before the results can be used in a subsequent stage. The software should be allowed enough iterations such that the percentage difference in the variance-covariance matrix are small. Once the value of the trace of covariance matrix stabilizes the program is said to have converged. In this research there may be a concern that the robust principal component analysis did not fully converge before the results were used for the subsequent stage of clustering.

In this research, the validation of the clustering solution was performed using the Kruskal-Wallis test of medians. This non-parametric test was carried out on the original environmental variables. A more rigorous procedure such as a non-parametric discriminant analysis can be used instead. The discriminating variables for such an analysis should be the original variables (as opposed to the factor scores from the principal component analysis). The error in the classification can be examined and a judgment can be made if the classification provides good separation in the data.

The cut-off for an observation to be a member of a particular cluster was chosen arbitrarily to be the average degree of belonging. If one had $n_c$ clusters, the average degree of belonging is $\frac{1}{n_c}$. In the context of this research if we use the clustering solution in chapter 5, where the clustering solution with 5 clusters was considered good enough the average degree of belonging is 0.2. The choice of cut-off as the average degree of belonging ensures that all observations or DMUs are accounted in at least one cluster. Other methods may be used to come up with a suitable cut-off based on the degree of belonging of the observation to a cluster. One strategy could be to have a cut-off set to higher than average degree of belonging (based on the number of clusters obtained, say $n_c$). This means that a few observations that have a degree of belonging less than the cut-off for all clusters possibly would not be assigned to any cluster at this stage. The analyst could then go on and form a separate group consisting only of these observations. A case can be made that these observation deserve their own group as they do not show a strong affinity to belong to any group. Note that by doing this the analyst is introducing an extra cluster in the analysis and will end with $n_c + 1$ clusters. Another method called the gap analysis could also be used to come up with the cut-off. This method would be data driven and thus be the most objective of all strategies to choose a cut-off. Such a method could potentially give rise to a situation in which a different cut-off is chosen for each cluster. Another avenue that can be explored is the possibility of including the degree of belongings directly as weights in the linear programming stage of the efficiency analysis for the cluster (local analysis). Such a scheme sidesteps the issue of choosing the appropriate cut-off altogether.

The representative object should be able to convey all the characteristics that make that cluster unique and how the relative efficiency is dependent on those characteristics. Another application of having a good representative object that was discussed during this research was to use it to calculate distances between the various local frontiers that have been defined by the clusters. The two representative objects presented in this thesis can be improved upon. None of the objects discussed in Chapter 4; the medoid or the observation closest to the mean vector capture both the environmental behavior and efficiency behavior of the clusters.

In conclusion, this research provides a new methodology to account for environmental variables in DEA evaluations. The subjective issue of how to suitably cluster the data and impose cut-offs during the grouping is an open issue. Further analysis must be conducted to allow the degree of belonging to be a part of the DEA evaluations. This may eliminate the need of imposing any cutoff. The method proposed in this work also allows a decision maker to suggest a continuous improvement path for an under performing unit. The frontiers of each cluster allow creation of benchmarks and targets that are realizable by DMUs operating in a similar environment. The environmental dependency index provides a new way to realize the dependence of the performance of a DMU on its operating environment.

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# Appendix A4.1

| | | | | OUTPUT | | | | | INPUT | | | ENVIRONMENTAL | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sr Number | Municipality Name | ACTHOUS | AVGHOUSE | STRAR | HEAVY | AVGINDU | DUMMY1 | WAGES | REPMAIN | SEREXP | EXTREV | INVEST | Political | INDEX | crs | vrs | half-normal | exponential | lambda |
| 1 | ag_anargir | 10907 | 66.8 | 3105 | 74378 | 70.2 | 0 | 131422 | 135096 | 1057 | 151678 | 185402 | 1 | 64.1 | 28.92 | 28.99 | 72.24 | 79.36 | 0.926 |
| 2 | ag_dimitrioy | 19221.2 | 70.6 | 4820 | 250296 | 91.3 | 0 | 179748 | 144551 | 4138 | 120210 | 246339 | 1 | 68.8 | 45.82 | 55.65 | 81.66 | 87.35 | 1.427 |
| 3 | ag_irendi | 5427.8 | 61.1 | 3524 | 498763 | 354.5 | 0 | 167614 | 19725 | 16344 | 79260 | 113479 | 1 | 90.5 | 48.19 | 50.41 | 75.00 | 82.09 | 1.552 |
| 4 | ag_nikolaou | 3438.5 | 63.1 | 1058 | 10886 | 67.9 | 1 | 49604 | 52348 | 6298 | 38038 | 46557 | 1 | 69.2 | 33.58 | 36.73 | 74.71 | 81.49 | 1.082 |
| 5 | ag_paraskeui | 16185.2 | 89.1 | 5227 | 33543 | 64.6 | 0 | 162562 | 23774 | 19112 | 91056 | 141045 | 1 | 92.5 | 48.26 | 69.65 | 83.21 | 88.44 | 1.298 |
| 6 | ag_varbaras | 9614 | 64.4 | 1800 | 37446 | 49.7 | 0 | 93032 | 196785 | 2768 | 45520 | 44573 | 0 | 66.1 | 22.69 | 22.79 | 63.43 | 68.67 | 0.886 |
| 7 | agriniou | 14086.2 | 61.3 | 8500 | 68020 | 59.8 | 0 | 145540 | 33406 | 11359 | 91960 | 73122 | 1 | 55.1 | 51.01 | 61.04 | 85.49 | 89.97 | 1.843 |
| 8 | aiginas | 3578.8 | 50.6 | 5850 | 2998 | 44.6 | 1 | 47035 | 31894 | 3406 | 49960 | 42133 | 1 | 75 | 42.96 | 46.49 | 79.76 | 85.84 | 1.091 |
| 9 | aitolikou | 1655 | 54.3 | 2800 | 5189 | 43.6 | 0 | 22998 | 5321 | 521 | 38633 | 27790 | 1 | 53.3 | 45.76 | 55.63 | 77.68 | 84.40 | 0.709 |
| 10 | alexandrias | 4091.5 | 82.4 | 7600 | 21261 | 58.6 | 0 | 27672 | 18985 | 7766 | 20207 | 47093 | 1 | 59.5 | 67.95 | 81.01 | 86.14 | 90.41 | 1.348 |
| 11 | alexandroupolis | 13220.7 | 82.5 | 11000 | 39263 | 48 | 0 | 134508 | 18576 | 11303 | 258319 | 255764 | 1 | 60.6 | 52.09 | 81.52 | 83.49 | 88.64 | 2.277 |
| 12 | alimou | 11785 | 81.6 | 5789 | 53013 | 95.2 | 0 | 158098 | 14262 | 9043 | 79608 | 72486 | 1 | 76.7 | 45.66 | 57.25 | 84.59 | 89.39 | 1.644 |
| 13 | almirou | 2427.8 | 79.8 | 12900 | 11599 | 34.4 | 0 | 32113 | 19786 | 5791 | 50907 | 16350 | 1 | 42.8 | 100 | 100 | 73.78 | 80.93 | 1 |
| 14 | amaliadas | 5501.2 | 59.3 | 5800 | 17864 | 28.8 | 0 | 68338 | 17381 | 14534 | 151628 | 50033 | 1 | 53.1 | 39.24 | 40.2 | 77.97 | 84.58 | 1.169 |
| 15 | amarousiou | 21346.8 | 84.2 | 7793 | 86370 | 96 | 0 | 259088 | 68947 | 15282 | 111207 | 159073 | 1 | 76 | 42.28 | 65.7 | 81.82 | 87.47 | 1.872 |
| 16 | ambelokipon | 15208.2 | 64.9 | 1803 | 84866 | 63.5 | 0 | 123466 | 93005 | 9051 | 70917 | 99699 | 0 | 84.9 | 44.81 | 46 | 82.23 | 87.75 | 1.039 |
| 17 | amfiloxias | 1590.3 | 71.9 | 1000 | 5251 | 50.7 | 0 | 19433 | 5657 | 2407 | 30687 | 20557 | 1 | 80.1 | 73.16 | 77.28 | 83.09 | 88.40 | 0.892 |
| 18 | amfissas | 2463.7 | 93.2 | 2282 | 8308 | 55.6 | 0 | 37858 | 7401 | 128 | 149877 | 137913 | 1 | 59.7 | 59.09 | 71.09 | 79.68 | 85.92 | 1.062 |
| 19 | an_liosia | 5508 | 77.1 | 9000 | 100809 | 121.6 | 0 | 111698 | 112094 | 1474 | 82421 | 75630 | 0 | 78.3 | 26.94 | 32.69 | 64.39 | 70.12 | 1.683 |
| 20 | argiroupoleos | 10692.2 | 73.8 | 3000 | 102901 | 91.6 | 0 | 129673 | 46787 | 2785 | 169876 | 130269 | 1 | 92.6 | 41.77 | 42.26 | 81.95 | 87.57 | 1.036 |
| 21 | argos_orestiko | 2285.5 | 76.6 | 1000 | 26877 | 150.7 | 0 | 16743 | 17917 | 220 | 12710 | 14721 | 0 | 60.6 | 100 | 100 | 87.90 | 91.52 | 1 |
| 22 | argostoliou | 2840.7 | 73.2 | 4500 | 10897 | 69.3 | 1 | 60273 | 40951 | 10737 | 156518 | 117529 | 1 | 89.4 | 29.56 | 30.89 | 69.32 | 75.92 | 1.043 |
| 23 | argous | 7491.7 | 66.4 | 3900 | 52233 | 41.6 | 0 | 75851 | 32277 | 21415 | 22862 | 20842 | 0 | 83.8 | 39.69 | 39.85 | 79.16 | 85.49 | 0.915 |
| 24 | arideas | 1673 | 70.6 | 1633 | 12664 | 43.6 | 0 | 15371 | 18986 | 4185 | 35900 | 20017 | 1 | 54.8 | 52.22 | 55.99 | 76.33 | 83.23 | 0.827 |
| 25 | artas | 7667 | 64.6 | 8830 | 32603 | 63.1 | 0 | 109059 | 22121 | 4893 | 212063 | 149822 | 1 | 98.7 | 41.37 | 46.42 | 81.94 | 87.59 | 1.758 |

| | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 26 | aspropirgou | 4211.2 | 61.4 | 5660 | 913084 | 527.2 | 0 | 115716 | 16706 | 310 | 50836 | 101538 | 0 | 69 | 100 | 100 | 83.13 | 88.45 | 1 |
| 27 | athens | 377929.5 | 63.3 | 38300 | 2194356 | 97.2 | 0 | 3416945 | 908939 | 134642 | 1441722 | 1471497 | 1 | 73 | 59.38 | 100 | 81.81 | 87.41 | 4.572 |
| 28 | axarnon | 14262.2 | 64.1 | 26369 | 350003 | 127.7 | 0 | 222298 | 185679 | 25349 | 156053 | 202670 | 1 | 93.1 | 41.08 | 99.14 | 72.54 | 79.71 | 4.572 |
| 29 | beroias | 13984.2 | 69 | 8500 | 77627 | 59.5 | 0 | 148774 | 57114 | 20057 | 235080 | 124697 | 1 | 71.4 | 41.37 | 49.45 | 80.56 | 86.56 | 1.839 |
| 30 | bolou | 30003.3 | 59.1 | 8059 | 135316 | 58.2 | 1 | 274345 | 73590 | 22171 | 540107 | 724765 | 1 | 112.5 | 54.81 | 100 | 87.21 | 90.96 | 2.863 |
| 31 | boulas | 7060 | 96.2 | 9003 | 3675 | 51.2 | 1 | 103832 | 11723 | 1473 | 59771 | 62012 | 0 | 69.5 | 51.45 | 100 | 82.92 | 88.12 | 1.604 |
| 32 | byrona | 23866 | 63.4 | 5024 | 66742 | 49.5 | 0 | 296472 | 39006 | 4291 | 100496 | 115856 | 0 | 79.3 | 43.12 | 56.54 | 80.05 | 86.16 | 1.577 |
| 33 | dafnis | 9916.2 | 63.3 | 1375 | 45278 | 45.8 | 0 | 95861 | 39141 | 10157 | 49239 | 38655 | 1 | 84.1 | 45.94 | 46.16 | 82.61 | 88.02 | 0.872 |
| 34 | didimotixou | 2655.7 | 73.2 | 2200 | 11352 | 47.9 | 0 | 32289 | 16726 | 6978 | 77330 | 83329 | 1 | 80.3 | 41.21 | 41.95 | 75.89 | 82.84 | 0.883 |
| 35 | distomou | 1935.3 | 46 | 3500 | 9564 | 47.4 | 0 | 13861 | 17918 | 1885 | 11586 | 17085 | 0 | 38.2 | 63.72 | 70.01 | 85.98 | 90.33 | 0.756 |
| 36 | dramas | 14678.8 | 67.9 | 7240 | 50006 | 41 | 0 | 124628 | 37100 | 43172 | 182243 | 270096 | 1 | 69.8 | 46.55 | 53.64 | 81.79 | 87.45 | 1.629 |
| 37 | drapetsonas | 4625.2 | 63.8 | 1725 | 33489 | 80.1 | 0 | 117110 | 38867 | 4989 | 159279 | 164235 | 1 | 83.8 | 20.35 | 21.13 | 61.98 | 66.66 | 1.18 |
| 38 | edessas | 6242.5 | 73.5 | 2400 | 17506 | 43.9 | 0 | 69603 | 13867 | 8478 | 71422 | 154526 | 1 | 89.2 | 46.52 | 46.76 | 82.88 | 88.22 | 1.006 |
| 39 | egaleo | 28084.5 | 62 | 5607 | 310597 | 85.8 | 0 | 372104 | 290765 | 21782 | 179678 | 132755 | 1 | 86.8 | 30.96 | 41.89 | 70.67 | 77.68 | 2.041 |
| 40 | eginiou | 1389 | 87.2 | 4300 | 7150 | 40.3 | 0 | 22422 | 3786 | 156 | 20828 | 13146 | 1 | 60.9 | 85.56 | 100 | 79.18 | 85.56 | 1.217 |
| 41 | egiou | 7416 | 68.1 | 5200 | 28904 | 56.6 | 0 | 94066 | 31467 | 18828 | 138630 | 81388 | 1 | 63.4 | 27.68 | 28.08 | 71.63 | 78.77 | 1.102 |
| 42 | elassonos | 2384.2 | 66.5 | 3300 | 17943 | 46.9 | 0 | 32209 | 5014 | 4714 | 38805 | 47601 | 1 | 64.4 | 47.32 | 51.83 | 80.65 | 86.66 | 0.84 |
| 43 | elefsinas | 6691.8 | 69.6 | 5900 | 133084 | 154.2 | 0 | 213516 | 50654 | 25925 | 102365 | 110012 | 0 | 98.4 | 20.65 | 23.51 | 61.64 | 66.19 | 1.654 |
| 44 | eleftheroupolis | 1740.7 | 70 | 1420 | 7135 | 32.1 | 0 | 20206 | 8937 | 8074 | 110483 | 104873 | 1 | 39.9 | 53.6 | 56.39 | 75.51 | 82.50 | 0.79 |
| 45 | ermoupolis | 5114.7 | 60.7 | 3200 | 17171 | 52.2 | 1 | 119529 | 59542 | 11286 | 156174 | 107797 | 1 | 108.9 | 23.87 | 27.87 | 65.57 | 71.20 | 1.193 |
| 46 | farssalon | 2524.7 | 76.2 | 2200 | 9177 | 50.5 | 0 | 39907 | 14576 | 1132 | 68557 | 73878 | 1 | 90.2 | 41.2 | 41.8 | 74.48 | 81.58 | 0.903 |
| 47 | filliatron | 2011 | 77.5 | 5400 | 4680 | 24.2 | 0 | 27362 | 46870 | 584 | 128103 | 61875 | 1 | 53.1 | 37.49 | 40.81 | 57.34 | 59.42 | 1.184 |
| 48 | florinas | 5106 | 62.8 | 4200 | 16600 | 87.7 | 0 | 45500 | 21345 | 5970 | 14924 | 24143 | 0 | 139.3 | 50 | 53.21 | 86.27 | 90.50 | 1.302 |
| 49 | galatsiou | 21379.3 | 65.7 | 4000 | 66416 | 68.2 | 0 | 184696 | 32492 | 12565 | 152372 | 134463 | 1 | 73.2 | 59.33 | 75.53 | 87.41 | 91.18 | 1.417 |
| 50 | gargalianon | 2205.8 | 52.3 | 6250 | 5524 | 28.1 | 1 | 16943 | 7872 | 100 | 8439 | 12379 | 0 | 46.9 | 100 | 100 | 89.88 | 92.68 | 1 |
| 51 | gastounis | 1332.8 | 71.6 | 3700 | 5809 | 32.9 | 0 | 11303 | 3887 | 2770 | 20701 | 15300 | 1 | 39.7 | 100 | 100 | 85.57 | 90.05 | 1 |
| 52 | gianitson | 7925.2 | 75.8 | 6000 | 32729 | 43 | 0 | 71014 | 25476 | 7335 | 104651 | 181149 | 1 | 84.8 | 48.07 | 53.53 | 83.35 | 88.55 | 1.258 |
| 53 | glifadas | 22920.8 | 84.3 | 23750 | 52959 | 77.4 | 1 | 285695 | 51512 | 4599 | 124518 | 172645 | 0 | 75.6 | 51.09 | 100 | 85.55 | 89.89 | 4.616 |
| 54 | grebenon | 3713.7 | 55.3 | 2460 | 10671 | 32.4 | 0 | 26747 | 11381 | 20 | 52092 | 52624 | 1 | 85.1 | 55.94 | 62.2 | 86.85 | 90.86 | 0.757 |
| 55 | ierapetras | 4397.7 | 64.8 | 2600 | 20654 | 46.5 | 1 | 37407 | 27229 | 9517 | 28231 | 29288 | 1 | 72.7 | 53.73 | 61.3 | 85.35 | 89.76 | 1.146 |
| 56 | igoumenitsas | 2669.8 | 73.6 | 2100 | 7361 | 58.2 | 0 | 32802 | 3317 | 3709 | 24415 | 28670 | 1 | 31.3 | 61.2 | 63.4 | 85.49 | 90.00 | 0.888 |

| | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 57 | ilioypoleos | 27376.5 | 70.3 | 7000 | 103925 | 63.1 | 0 | 269818 | 40419 | 23066 | 139115 | 205796 | 0 | 71.9 | 52.64 | 74.89 | 84.48 | 89.29 | 1.858 |
| 58 | imitou | 4650 | 66.9 | 975 | 13949 | 49.4 | 0 | 77272 | 8363 | 832 | 52567 | 59687 | 1 | 85.4 | 37.49 | 38 | 78.89 | 85.30 | 0.916 |
| 59 | ioannninon | 23243 | 60.9 | 6856 | 56894 | 52.1 | 0 | 252517 | 87420 | 27387 | 311219 | 243364 | 1 | 73 | 38.54 | 52.86 | 77.93 | 84.52 | 1.746 |
| 60 | iracliou | 14716.5 | 70.7 | 4482 | 105646 | 85 | 0 | 191188 | 38970 | 13412 | 164581 | 103037 | 1 | 94.7 | 41.93 | 43.96 | 81.96 | 87.57 | 1.123 |
| 61 | irakliou | 39220.7 | 68.2 | 11200 | 134922 | 49.8 | 1 | 513419 | 116097 | 18835 | 631984 | 330572 | 1 | 66.3 | 37.32 | 100 | 78.00 | 84.30 | 3.451 |
| 62 | istieas | 1947.8 | 82.8 | 1800 | 13684 | 51.6 | 0 | 26644 | 22680 | 8426 | 38746 | 21797 | 1 | 59.3 | 44.17 | 44.33 | 70.57 | 77.65 | 0.976 |
| 63 | kabalas | 23060.7 | 79.4 | 8000 | 119856 | 78.9 | 0 | 307931 | 164123 | 35014 | 351919 | 521460 | 1 | 90.1 | 31.38 | 46.03 | 72.38 | 79.48 | 1.942 |
| 64 | kaissarianis | 11605.2 | 60.6 | 1200 | 31746 | 55.6 | 0 | 156478 | 17215 | 9526 | 60897 | 46656 | 0 | 69.3 | 41.1 | 41.36 | 81.04 | 86.91 | 1.053 |
| 65 | kalamarias | 26033.7 | 74.9 | 4159 | 94527 | 65.9 | 0 | 245231 | 60314 | 18609 | 82938 | 188832 | 1 | 84.1 | 50.82 | 69.57 | 83.64 | 88.72 | 1.738 |
| 66 | kalamatas | 16523.3 | 46.3 | 8906 | 67097 | 45.6 | 0 | 184250 | 271238 | 14721 | 964398 | 349469 | 1 | 99.8 | 24.5 | 31.45 | 66.09 | 72.33 | 1.97 |
| 67 | kalambakas | 2216.8 | 77.8 | 3200 | 7298 | 54.7 | 0 | 21451 | 3792 | 1029 | 4211 | 13073 | 0 | 51.7 | 86.67 | 87.56 | 88.50 | 91.89 | 0.929 |
| 68 | kalimnou | 5378.8 | 73 | 4800 | 21790 | 63.3 | 1 | 123840 | 103567 | 8524 | 134725 | 125331 | 1 | 66.9 | 20.75 | 24.49 | 61.54 | 65.47 | 1.21 |
| 69 | kallitheas | 49376.3 | 63.3 | 4665 | 241894 | 90.1 | 0 | 726651 | 125872 | 30659 | 40706 | 210495 | 0 | 108 | 38.75 | 59.72 | 77.34 | 84.00 | 3.345 |
| 70 | kamaterou | 5214.5 | 66 | 5000 | 68186 | 98.7 | 0 | 51720 | 23367 | 671 | 57689 | 65742 | 0 | 47.7 | 57.24 | 60.56 | 88.07 | 91.63 | 1.265 |
| 71 | karditsas | 10739.7 | 80.1 | 10555 | 50442 | 51.4 | 0 | 138607 | 37795 | 7999 | 109900 | 71639 | 0 | 56 | 41.68 | 60.57 | 79.53 | 85.79 | 2.143 |
| 72 | karlovasi | 2187 | 88.7 | 3050 | 26000 | 94.6 | 1 | 17178 | 4025 | 3081 | 63925 | 67063 | 1 | 36.3 | 100 | 100 | 91.89 | 93.97 | 1 |
| 73 | karpenisiou | 2139.2 | 53.5 | 5000 | 5573 | 46.6 | 0 | 17689 | 87351 | 2297 | 25568 | 44297 | 1 | 79.9 | 25.42 | 25.67 | 55.67 | 56.78 | 0.952 |
| 74 | kastorias | 6090 | 66.8 | 5000 | 127051 | 55.1 | 0 | 106122 | 25853 | 9413 | 52484 | 61737 | 0 | 181.8 | 37.12 | 37.27 | 74.70 | 81.73 | 1.025 |
| 75 | katerinis | 14777.8 | 81.2 | 10000 | 78686 | 51.4 | 0 | 166916 | 75689 | 3823 | 151551 | 151402 | 1 | 79.8 | 41.24 | 61.44 | 78.62 | 85.06 | 2.128 |
| 76 | kerateas | 4791.7 | 65 | 6000 | 14377 | 37.3 | 0 | 31058 | 15043 | 6635 | 19887 | 55892 | 0 | 55.3 | 68.26 | 69.23 | 88.40 | 91.82 | 1.163 |
| 77 | keratsiniou | 25558.3 | 65.6 | 4900 | 126660 | 74.6 | 0 | 239886 | 72348 | 23604 | 216677 | 286992 | 0 | 83 | 44.33 | 58.83 | 81.83 | 87.47 | 1.732 |
| 78 | kerkiras | 15628 | 57.7 | 13100 | 33166 | 44.2 | 1 | 285507 | 25991 | 27089 | 198964 | 255439 | 1 | 149.6 | 34.36 | 51.17 | 76.71 | 83.27 | 2.531 |
| 79 | kiatou | 3924 | 74.9 | 1700 | 18450 | 55 | 1 | 35803 | 8252 | 13533 | 54765 | 51538 | 1 | 83 | 56.35 | 63.08 | 85.72 | 90.01 | 1.114 |
| 80 | kifisias | 14152.3 | 111.6 | 10937 | 69959 | 84.7 | 0 | 213045 | 30337 | 10210 | 89567 | 295270 | 1 | 82.4 | 37.78 | 82.81 | 77.67 | 84.29 | 2.285 |
| 81 | kilkis | 4396.3 | 73.1 | 5000 | 27588 | 59.8 | 0 | 16913 | 2458 | 2612 | 199408 | 12285 | 1 | 90 | 100 | 100 | 93.02 | 94.81 | 1 |
| 82 | kiparissias | 1920 | 54 | 4984 | 4839 | 29 | 0 | 16799 | 3310 | 5283 | 27955 | 17303 | 0 | 75.6 | 84.11 | 86.89 | 85.76 | 90.19 | 0.915 |
| 83 | ko | 4882.8 | 59.6 | 20500 | 14691 | 67.8 | 1 | 125939 | 41137 | 9740 | 83456 | 97255 | 1 | 82.4 | 51.06 | 100 | 69.34 | 76.00 | 9.204 |
| 84 | komotinis | 12894.3 | 58.8 | 6850 | 30463 | 34.9 | 0 | 204849 | 49598 | 30915 | 159600 | 178449 | 1 | 100.2 | 30.12 | 31.37 | 69.79 | 76.74 | 1.52 |
| 85 | koridalou | 21864.8 | 66.2 | 3524 | 59845 | 53.1 | 0 | 190999 | 29242 | 15467 | 74292 | 52049 | 0 | 63.5 | 56.84 | 71.39 | 85.81 | 90.17 | 1.444 |
| 86 | korinthou | 9938.5 | 79.2 | 7080 | 40347 | 65.3 | 1 | 126104 | 50215 | 26218 | 49233 | 83055 | 1 | 87 | 38.27 | 60.52 | 80.69 | 86.48 | 1.657 |
| 87 | koufalion | 2095.8 | 65.4 | 2457 | 12772 | 34.7 | 0 | 22969 | 15412 | 632 | 18857 | 40617 | 1 | 46.5 | 45.98 | 50.65 | 76.80 | 83.62 | 0.77 |

| | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 88 | kozanis | 12120.5 | 85.7 | 4500 | 54348 | 94.8 | 0 | 186942 | 293205 | 24989 | 426332 | 186291 | 0 | 79.3 | 16.8 | 20.64 | 55.61 | 56.48 | 1.627 |
| 89 | kropias | 6756.2 | 67 | 27540 | 159329 | 102.2 | 0 | 83159 | 67956 | 3031 | 28675 | 193175 | 0 | 111.4 | 93.16 | 100 | 80.88 | 86.84 | 2.772 |
| 90 | lagada | 1920.5 | 67.2 | 3150 | 10494 | 30.8 | 0 | 28729 | 3292 | 3283 | 33444 | 39997 | 0 | 65.2 | 57.04 | 60.8 | 79.70 | 85.94 | 0.855 |
| 91 | lamias | 16860.8 | 55.9 | 5500 | 56728 | 53.3 | 0 | 160315 | 76669 | 11467 | 285486 | 296843 | 1 | 64.8 | 43.05 | 49.68 | 82.05 | 87.64 | 1.361 |
| 92 | larissas | 38964.3 | 83 | 34500 | 139364 | 60.5 | 0 | 555930 | 101957 | 44504 | 410579 | 296602 | 0 | 87.2 | 40.5 | 100 | 75.38 | 82.32 | 7.088 |
| 93 | lavreotiki | 4493.5 | 54.6 | 2800 | 10265 | 55.2 | 0 | 67587 | 25371 | 4137 | 37370 | 41184 | 1 | 50 | 31.44 | 31.8 | 76.67 | 83.54 | 0.93 |
| 94 | lerou | 2482.5 | 69.3 | 1260 | 6336 | 36.6 | 1 | 44373 | 16783 | 6010 | 23441 | 50609 | 0 | 90.4 | 42.54 | 43.68 | 74.39 | 81.17 | 1.019 |
| 95 | levadias | 6588.8 | 53.8 | 7900 | 25437 | 49.3 | 0 | 74361 | 15948 | 558 | 34005 | 76775 | 1 | 76.4 | 51.27 | 53.68 | 85.66 | 90.10 | 1.553 |
| 96 | litoxorou | 2567.2 | 49.1 | 4500 | 2254 | 42.3 | 1 | 17786 | 22978 | 774 | 44579 | 40364 | 1 | 69.3 | 61.61 | 63.29 | 85.47 | 89.89 | 1.024 |
| 97 | loutraki | 8473.2 | 49.8 | 10000 | 10286 | 63.9 | 1 | 105341 | 30668 | 29429 | 23852 | 71437 | 1 | 83.3 | 42.81 | 56.16 | 83.88 | 88.81 | 1.815 |
| 98 | mandras | 3659.3 | 67.1 | 2500 | 184302 | 312.8 | 0 | 71992 | 42985 | 8365 | 90675 | 27380 | 1 | 84 | 64.13 | 67.36 | 77.75 | 84.45 | 1.698 |
| 99 | markopoulou | 8992.3 | 64.1 | 11750 | 28127 | 46 | 0 | 53781 | 20690 | 704 | 121345 | 153455 | 1 | 69.5 | 94.68 | 100 | 91.23 | 93.59 | 2.248 |
| 100 | megalopolis | 1952.2 | 70.5 | 3000 | 3597 | 59.3 | 0 | 24148 | 9866 | 8027 | 60511 | 46770 | 1 | 40.3 | 46.07 | 49.98 | 76.52 | 83.44 | 0.859 |
| 101 | megaron | 8842.7 | 97.7 | 12000 | 78278 | 49.6 | 0 | 105946 | 35273 | 23233 | 87546 | 64501 | 0 | 57.5 | 45.04 | 83.21 | 77.27 | 83.96 | 2.268 |
| 102 | menemenis | 3936 | 65.6 | 5800 | 95700 | 163.3 | 0 | 78584 | 16691 | 4959 | 47577 | 80102 | 0 | 102.2 | 49.98 | 56.7 | 81.23 | 87.10 | 1.593 |
| 103 | metamorfosis | 6485.7 | 65.4 | 3700 | 255946 | 188.7 | 0 | 97340 | 32345 | 10020 | 54687 | 123482 | 1 | 79.2 | 51.98 | 53.46 | 84.14 | 89.10 | 1.225 |
| 104 | mikonos | 2631.2 | 48.8 | 1900 | 4734 | 56.8 | 1 | 33002 | 42487 | 317 | 7253 | 23567 | 0 | 64.1 | 35.44 | 36.83 | 74.89 | 81.71 | 1.029 |
| 105 | mitilinis | 10995.3 | 58.6 | 3600 | 37212 | 43.4 | 1 | 126140 | 45786 | 29580 | 184002 | 134731 | 0 | 114.9 | 41.53 | 61.73 | 81.84 | 87.31 | 1.58 |
| 106 | mosxatou | 8225.2 | 66.7 | 2300 | 291499 | 172.2 | 0 | 124273 | 22580 | 575 | 50617 | 64561 | 1 | 141.3 | 55.51 | 55.57 | 85.04 | 89.68 | 0.962 |
| 107 | n_erithrea | 4179.3 | 105.1 | 3380 | 6814 | 53.8 | 0 | 62221 | 10554 | 13307 | 43567 | 74809 | 1 | 58.5 | 40.16 | 65.78 | 72.72 | 79.86 | 1.292 |
| 108 | n_filadelfias | 9568 | 67.5 | 2376 | 64032 | 93.2 | 0 | 166399 | 29717 | 9789 | 62346 | 63439 | 0 | 99.2 | 32.12 | 33.97 | 76.89 | 83.68 | 1.427 |
| 109 | n_ionias | 22490.3 | 62.3 | 4382 | 188849 | 73.7 | 0 | 192092 | 26553 | 14393 | 108568 | 194193 | 0 | 78.1 | 66.26 | 83.42 | 88.27 | 91.72 | 2.782 |
| 110 | n_ionias2 | 9210.7 | 69 | 5500 | 29409 | 48.2 | 0 | 81791 | 31995 | 7073 | 112321 | 137766 | 0 | 72.8 | 49.1 | 49.98 | 84.47 | 89.31 | 1.1 |
| 111 | n_liosion | 23256.3 | 72.8 | 7816 | 158131 | 67 | 0 | 204270 | 170419 | 3539 | 270536 | 249671 | 1 | 74 | 43.02 | 59.49 | 79.98 | 86.11 | 1.908 |
| 112 | n_psixikou | 4576.7 | 89.6 | 1000 | 13024 | 81.4 | 0 | 54531 | 33750 | 620 | 22294 | 7596 | 1 | 90.5 | 38.37 | 46.85 | 77.82 | 84.44 | 1.189 |
| 113 | n_smirnis | 29573.2 | 74.2 | 3500 | 39328 | 65 | 0 | 245751 | 40848 | 8675 | 40874 | 104380 | 1 | 70.5 | 61.19 | 88.33 | 86.36 | 90.51 | 1.947 |
| 114 | n_xalkidona | 4082.7 | 71 | 770 | 35688 | 123.3 | 0 | 55655 | 12546 | 2105 | 43639 | 23563 | 1 | 93.5 | 53.68 | 57.73 | 84.33 | 89.23 | 1.454 |
| 115 | nafpactou | 4241 | 70.7 | 5000 | 13828 | 43 | 0 | 38929 | 7655 | 18839 | 59060 | 47458 | 1 | 56.3 | 45.74 | 45.9 | 82.92 | 88.27 | 0.988 |
| 116 | nafpliou | 4145.7 | 69.8 | 3770 | 13724 | 66.9 | 0 | 64010 | 9299 | 13039 | 34458 | 51732 | 1 | 64.6 | 35.89 | 36.02 | 78.78 | 85.25 | 1.024 |
| 117 | naousas | 6556.8 | 77.6 | 5100 | 26041 | 38.7 | 0 | 88301 | 47654 | 8062 | 52961 | 94618 | 1 | 67 | 30.91 | 34.37 | 71.68 | 78.78 | 1.066 |
| 118 | neapolis | 11691.8 | 66.3 | 918 | 46736 | 36.1 | 0 | 94408 | 19143 | 8264 | 37180 | 88840 | 0 | 75.8 | 57.5 | 57.65 | 85.15 | 89.72 | 0.915 |

| | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 119 | nigritas | 2116.8 | 57.4 | 2500 | 7985 | 38.9 | 0 | 24494 | 13246 | 264 | 23669 | 29019 | 0 | 90.3 | 49.83 | 58.99 | 81.95 | 87.61 | 0.694 |
| 120 | nikaias | 32526.8 | 63.4 | 4578 | 143730 | 62.7 | 0 | 308447 | 46452 | 21985 | 114358 | 157663 | 0 | 87.4 | 54.29 | 76.43 | 84.60 | 89.37 | 2.191 |
| 121 | orestiadas | 5074.7 | 77.8 | 9000 | 25260 | 51.3 | 0 | 34629 | 11465 | 9804 | 45694 | 91308 | 0 | 65.4 | 78.34 | 90.28 | 88.15 | 91.67 | 1.585 |
| 122 | orxomenou | 1664 | 81.5 | 2300 | 8463 | 55.7 | 0 | 20435 | 6223 | 78 | 8845 | 31621 | 0 | 55.1 | 84.78 | 85.62 | 84.92 | 89.62 | 1.057 |
| 123 | p_falirou | 24954.5 | 79.7 | 4246 | 48275 | 69.4 | 0 | 318221 | 47291 | 22534 | 81164 | 102157 | 1 | 70.3 | 41.9 | 59.72 | 79.61 | 85.83 | 1.643 |
| 124 | p_psixiko | 4362.8 | 140.8 | 2546 | 363 | 205.2 | 0 | 93527 | 11449 | 4652 | 39190 | 33032 | 1 | 121.3 | 50.61 | 100 | 73.11 | 80.37 | 1.981 |
| 125 | paianias | 2736.8 | 81.6 | 5000 | 61107 | 97.7 | 0 | 27457 | 6969 | 396 | 17476 | 19009 | 0 | 50.7 | 98.54 | 100 | 89.69 | 92.64 | 1.136 |
| 126 | palama | 1586 | 90.3 | 4793 | 7644 | 41.3 | 0 | 18838 | 28502 | 4401 | 49837 | 40808 | 1 | 83.8 | 48.32 | 60.71 | 63.69 | 69.16 | 1.27 |
| 127 | papagou | 5042.8 | 117 | 2600 | 1389 | 52.2 | 0 | 64983 | 5827 | 1439 | 12551 | 44650 | 0 | 80.3 | 53.44 | 100 | 78.84 | 85.27 | 1.465 |
| 128 | patras | 53984.7 | 69.5 | 26000 | 264504 | 82.9 | 0 | 1227553 | 210520 | 43020 | 136717 | 239704 | 0 | 100.7 | 25.06 | 45.77 | 63.27 | 68.43 | 5.868 |
| 129 | peramatos | 7395.3 | 67.5 | 3000 | 88999 | 104.1 | 0 | 112463 | 14285 | 792 | 60123 | 178938 | 1 | 105.3 | 40.22 | 42.25 | 82.14 | 87.72 | 1.319 |
| 130 | peristeriou | 48534.8 | 66.3 | 10071 | 566183 | 81.6 | 0 | 570801 | 110101 | 12254 | 236456 | 461035 | 1 | 61.2 | 52.29 | 79.66 | 82.09 | 87.63 | 3.551 |
| 131 | petroupolis | 15192.7 | 72.6 | 3700 | 38013 | 48.4 | 0 | 81799 | 11976 | 880 | 60332 | 367584 | 0 | 57.9 | 100 | 100 | 92.14 | 94.18 | 1 |
| 132 | peykis | 5644.5 | 88 | 2076 | 19335 | 75.6 | 0 | 45348 | 33101 | 3307 | 29710 | 16587 | 1 | 61 | 50.21 | 61.36 | 85.32 | 89.86 | 1.265 |
| 133 | pileas | 5527.2 | 81.2 | 7300 | 64301 | 89.7 | 0 | 43003 | 9786 | 8111 | 10732 | 37623 | 0 | 68.2 | 73.68 | 94.1 | 89.92 | 92.77 | 1.39 |
| 134 | pirea | 72947.3 | 65.2 | 10865 | 635191 | 103.1 | 0 | 1611765 | 113865 | 44565 | 361435 | 885017 | 1 | 108.8 | 29.55 | 46.45 | 67.21 | 73.62 | 5.164 |
| 135 | pirgou | 8154.7 | 56.2 | 12000 | 37387 | 50.4 | 0 | 82763 | 21343 | 10307 | 85568 | 69581 | 1 | 76.4 | 57.8 | 62.74 | 85.40 | 89.93 | 2.217 |
| 136 | poligirou | 3464.5 | 64.6 | 3800 | 4804 | 38.6 | 0 | 25335 | 9961 | 22012 | 9103 | 13353 | 0 | 44.7 | 42.69 | 45.8 | 80.49 | 86.55 | 0.856 |
| 137 | polixnis | 8163.5 | 73.3 | 2520 | 54436 | 64.2 | 0 | 79697 | 16983 | 12840 | 123303 | 107309 | 1 | 68.3 | 50.14 | 50.43 | 85.25 | 89.81 | 1.01 |
| 138 | prevezas | 5558.7 | 59.6 | 3615 | 15598 | 28.9 | 0 | 71484 | 28404 | 267 | 98217 | 89136 | 0 | 60.5 | 34.7 | 35.59 | 75.45 | 82.42 | 0.816 |
| 139 | psaxnon | 1653.3 | 60.5 | 900 | 3959 | 16.6 | 0 | 13930 | 25746 | 4530 | 21279 | 8078 | 1 | 66.4 | 42.12 | 49.04 | 65.68 | 71.78 | 0.693 |
| 140 | ptolemaidas | 8889.5 | 80.1 | 4200 | 21422 | 53.9 | 0 | 94709 | 32506 | 7826 | 94314 | 69268 | 1 | 80.3 | 41.53 | 45.36 | 80.75 | 86.70 | 1.098 |
| 141 | rethimnou | 8560 | 67.4 | 1500 | 34587 | 56.9 | 1 | 110916 | 71440 | 8142 | 300494 | 233788 | 1 | 65.2 | 35.99 | 51.75 | 78.58 | 84.81 | 1.419 |
| 142 | rodou | 16838.7 | 70.6 | 4400 | 52399 | 52.6 | 1 | 579020 | 429867 | 47697 | 286484 | 335683 | 1 | 71.7 | 11.68 | 20.17 | 44.89 | 38.31 | 1.964 |
| 143 | salaminas | 11456.7 | 63.9 | 13423 | 10644 | 38.5 | 1 | 79196 | 27651 | 1365 | 160591 | 168319 | 1 | 49 | 83.77 | 100 | 90.52 | 93.08 | 2.499 |
| 144 | samou | 2325.7 | 69 | 800 | 5566 | 71.9 | 1 | 27077 | 18653 | 10930 | 107957 | 97338 | 0 | 135.3 | 44.9 | 45.49 | 79.20 | 85.36 | 1.009 |
| 145 | sappon | 1272.3 | 40.9 | 2500 | 2354 | 25.2 | 0 | 17303 | 2000 | 5348 | 90433 | 93153 | 1 | 99.5 | 54.57 | 78.76 | 80.64 | 86.69 | 0.58 |
| 146 | seron | 18421.2 | 66.4 | 8200 | 47855 | 37.5 | 0 | 184061 | 62576 | 25373 | 263631 | 193963 | 1 | 68.1 | 42.42 | 55.38 | 78.47 | 84.93 | 1.884 |
| 147 | siatista | 1820.8 | 73.1 | 2500 | 28208 | 43.3 | 0 | 17274 | 5328 | 17244 | 20328 | 31369 | 1 | 73.7 | 54.12 | 58.83 | 77.62 | 84.30 | 0.827 |
| 148 | sikeon | 12471.3 | 69.1 | 3283 | 54758 | 47.9 | 0 | 112044 | 18877 | 11056 | 42826 | 61834 | 0 | 69.6 | 57.73 | 57.81 | 86.49 | 90.60 | 0.954 |
| 149 | siteias | 3091.8 | 76.3 | 602 | 13625 | 64.2 | 1 | 26776 | 31153 | 8896 | 81920 | 40319 | 1 | 79 | 43.52 | 46.67 | 79.36 | 85.44 | 1.06 |

| | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 150 | sofadon | 1382.2 | 70.8 | 2500 | 11429 | 39.9 | 0 | 16105 | 10141 | 18 | 10990 | 34519 | 1 | 75.9 | 71.29 | 74.44 | 80.39 | 86.47 | 0.916 |
| 151 | soufli | 1724 | 69.8 | 3300 | 10666 | 55.6 | 0 | 24787 | 9457 | 7126 | 37324 | 33737 | 1 | 72.3 | 47.33 | 49.72 | 75.10 | 82.17 | 0.897 |
| 152 | spartis | 5734 | 85.9 | 3000 | 31709 | 61.3 | 0 | 39910 | 13493 | 689 | 18921 | 35889 | 0 | 60.1 | 67.83 | 80.47 | 89.37 | 92.41 | 1.175 |
| 153 | spaton | 2139.2 | 96.1 | 5500 | 20840 | 65.4 | 0 | 24364 | 7115 | 5031 | 11396 | 40833 | 0 | 60.1 | 81.58 | 100 | 83.12 | 88.42 | 1.346 |
| 154 | stavroupolis | 12419 | 68.4 | 3425 | 79810 | 61.4 | 0 | 95816 | 30367 | 16550 | 41568 | 108425 | 0 | 70.4 | 55.4 | 55.49 | 86.39 | 90.54 | 0.95 |
| 155 | stilidos | 1799.8 | 62.6 | 900 | 11684 | 56.5 | 0 | 21942 | 5058 | 3296 | 37942 | 99978 | 0 | 54 | 64.8 | 76.79 | 85.45 | 89.97 | 0.723 |
| 156 | tavrou | 5563.2 | 60.6 | 2080 | 272412 | 211 | 0 | 142087 | 62269 | 8040 | 96785 | 63405 | 0 | 95 | 33.7 | 35.18 | 71.23 | 78.38 | 1.358 |
| 157 | thessalonikis | 163641.2 | 77.2 | 17632 | 980706 | 63.3 | 0 | 1142742 | 782832 | 97088 | 660668 | 666449 | 1 | 112.2 | 56.54 | 94.08 | 79.72 | 85.84 | 1.358 |
| 158 | thivas | 5873 | 76 | 2200 | 34292 | 56.3 | 0 | 96801 | 31239 | 8679 | 140123 | 153570 | 1 | 61.4 | 30.26 | 31.35 | 73.17 | 80.28 | 1.041 |
| 159 | tirnavou | 3155 | 66.8 | 5350 | 9333 | 23.3 | 0 | 35804 | 9628 | 5775 | 19968 | 25582 | 0 | 73.2 | 50.15 | 50.49 | 77.60 | 84.27 | 1.023 |
| 160 | triandria | 4306.5 | 71.4 | 1475 | 14916 | 34.4 | 0 | 34167 | 12347 | 3540 | 14554 | 32614 | 0 | 80.9 | 57.9 | 58.54 | 85.95 | 90.27 | 0.977 |
| 161 | trikeon | 16901.7 | 72.3 | 14300 | 82446 | 56.2 | 0 | 211174 | 51758 | 11265 | 206037 | 225461 | 1 | 39.1 | 43.59 | 68.68 | 80.68 | 86.64 | 2.955 |
| 162 | tripolis | 9215.8 | 70.6 | 8000 | 25602 | 43.9 | 0 | 106057 | 42826 | 10148 | 98842 | 176986 | 1 | 71.4 | 37.34 | 40.58 | 76.91 | 83.69 | 1.648 |
| 163 | xaidariou | 14189.5 | 67.8 | 11023 | 72762 | 69.2 | 0 | 203354 | 67814 | 15677 | 118669 | 208152 | 1 | 94.6 | 33.89 | 45.75 | 76.42 | 83.28 | 2.302 |
| 164 | xalandriou | 23707 | 82.8 | 9355 | 60956 | 70.8 | 0 | 224886 | 30703 | 3037 | 107685 | 133707 | 1 | 71.1 | 63.39 | 100 | 87.62 | 91.32 | 2.208 |
| 165 | xalkidas | 16961 | 74.5 | 8500 | 56441 | 55.3 | 0 | 269664 | 104341 | 43255 | 188687 | 94393 | 0 | 91.1 | 26.92 | 36.17 | 67.15 | 73.62 | 1.907 |
| 166 | xanion | 18732.2 | 68.3 | 11100 | 69198 | 51.1 | 1 | 259741 | 55686 | 15547 | 184747 | 175590 | 0 | 85.2 | 39.61 | 69.53 | 80.73 | 86.49 | 2.557 |
| 167 | xanthis | 12702.3 | 73.1 | 3700 | 35702 | 33.8 | 0 | 120952 | 56485 | 14794 | 77860 | 25769 | 0 | 69.7 | 42.62 | 42.72 | 78.82 | 85.20 | 1.005 |
| 168 | xiou | 9754.2 | 64.6 | 7200 | 30283 | 39.5 | 1 | 81325 | 31265 | 9421 | 171326 | 132714 | 1 | 100.4 | 55.32 | 77.06 | 86.38 | 90.44 | 1.5 |
| 169 | xolargou | 13026.7 | 84.4 | 2496 | 13290 | 72.4 | 0 | 111563 | 12376 | 11631 | 79865 | 126424 | 1 | 95.2 | 52.05 | 59.19 | 84.90 | 89.58 | 1.337 |
| 170 | xrisoupolis | 2379.7 | 90.3 | 4500 | 9335 | 54.7 | 0 | 23119 | 17015 | 3920 | 30008 | 21200 | 0 | 52.2 | 61.17 | 72.58 | 80.69 | 86.69 | 1.196 |
| 171 | zakinthou | 3705 | 66.4 | 4267 | 11594 | 53.3 | 1 | 58078 | 17285 | 14537 | 88939 | 55634 | 1 | 88.6 | 36.49 | 39.99 | 76.41 | 83.04 | 1.1 |
| 172 | zografou | 36664.8 | 63 | 4187 | 57359 | 56.8 | 0 | 381884 | 104092 | 20075 | 132465 | 119056 | 1 | 69.1 | 45.54 | 67.93 | 80.24 | 86.29 | 2.413 |

# Appendix A4.2

| Obs | Factor1 | Factor2 | Factor3 | Which Set? |
|---|---|---|---|---|
| 1 | 0.5812 | -1.1463 | -0.6866 | Training |
| 2 | 0.8918 | -0.89 | -0.5665 | Training |
| 3 | 0.6878 | -0.0077 | 0.9998 | Training |
| 4 | -0.4988 | -0.7141 | 0.3664 | Training |
| 5 | 1.023 | 0.0994 | 0.9334 | HoldOut |
| 6 | -0.882 | 0.9945 | -0.6271 | Training |
| 7 | -0.0199 | -0.982 | -0.7548 | Training |
| 8 | -0.5068 | -0.6832 | 0.6975 | HoldOut |
| 9 | -0.9853 | -1.2416 | -0.3466 | HoldOut |
| 10 | -0.6399 | -0.8641 | -0.1203 | Training |
| 11 | 1.8883 | -1.1105 | -1.6443 | Training |
| 12 | 0.0488 | -0.533 | 0.4977 | Training |
| 13 | -0.8839 | -1.3572 | -1.0036 | Training |
| 14 | 0.2903 | -1.0444 | -1.0494 | Training |
| 15 | 0.9023 | -0.4147 | -0.0321 | Training |
| 16 | -0.0155 | 1.5641 | 0.024 | HoldOut |
| 17 | -0.708 | -0.5655 | 1.1284 | HoldOut |
| 18 | 0.2441 | -1.2773 | -0.7492 | HoldOut |
| 19 | -0.4404 | 1.1792 | -0.1787 | Training |
| 20 | 0.7672 | -0.4881 | 0.9463 | Training |
| 21 | -1.3729 | 0.8489 | -0.6714 | Training |
| 22 | 0.9029 | -0.3193 | 0.7388 | Training |
| 23 | -0.2167 | 1.9516 | 0.2014 | HoldOut |
| 24 | -0.8821 | -1.1021 | -0.287 | HoldOut |
| 25 | 1.2457 | -0.3587 | 1.0302 | HoldOut |
| 26 | -0.6243 | 0.9926 | -0.6367 | Training |
| 27 | 19.5504 | 0.7953 | -11.0649 | Training |
| 28 | 1.9449 | 0.1864 | 0.4367 | HoldOut |
| 29 | 1.5409 | -0.6027 | -0.6841 | Training |
| 30 | 6.8201 | -0.0255 | -1.5344 | HoldOut |
| 31 | -0.7283 | 1.0147 | -0.5304 | Training |
| 32 | -0.0144 | 1.2563 | -0.3638 | Training |
| 33 | -0.1699 | -0.2872 | 1.1 | HoldOut |
| 34 | 0.0502 | -0.5027 | 0.6975 | Training |
| 35 | -1.5403 | 0.3866 | -1.9148 | Training |
| 36 | 2.8794 | 0.1175 | -1.4155 | Training |
| 37 | 0.8759 | -0.604 | 0.3621 | Training |
| 38 | 0.537 | -0.2362 | 0.9452 | Training |
| 39 | 1.5092 | -0.1081 | 0.2947 | Training |
| 40 | -1.0916 | -1.0506 | 0.1821 | Training |
| 41 | 0.6565 | -0.6628 | -0.6138 | Training |
| 42 | -0.6017 | -0.8688 | 0.1247 | Training |
| 43 | 1.0082 | 2.2898 | 0.3485 | Training |
| 44 | -0.044 | -1.4463 | -1.6972 | HoldOut |
| 45 | 1.0795 | 0.1397 | 1.82 | HoldOut |

| | | | | |
|---|---|---|---|---|
| 46 | -0.1681 | -0.4262 | 1.3866 | Training |
| 47 | -0.319 | -1.3907 | -0.7882 | Training |
| 48 | -0.2527 | 2.8017 | 3.4657 | HoldOut |
| 49 | 0.8661 | -0.6281 | -0.2079 | Training |
| 50 | -1.5586 | 0.54 | -1.3891 | HoldOut |
| 51 | -1.2051 | -1.4608 | -1.0138 | HoldOut |
| 52 | 0.7651 | -0.4204 | 0.5192 | Training |
| 53 | 0.3822 | 1.1491 | -0.84 | HoldOut |
| 54 | -0.4651 | -0.549 | 1.2555 | Training |
| 55 | -0.4793 | -0.5309 | 0.5975 | Training |
| 56 | -1.1688 | -1.6304 | -1.5405 | Training |
| 57 | 1.3101 | 1.5592 | -1.4868 | HoldOut |
| 58 | -0.3915 | -0.5192 | 1.2344 | Training |
| 59 | 2.8704 | -0.472 | -1.3694 | HoldOut |
| 60 | 1.0327 | -0.14 | 1.0032 | Training |
| 61 | 4.6747 | -1.3929 | -3.0266 | Training |
| 62 | -0.645 | -0.886 | -0.1247 | HoldOut |
| 63 | 5.0024 | 0.1069 | -1.6136 | Training |
| 64 | -0.4908 | 1.2297 | -0.6199 | Training |
| 65 | 1.1156 | -0.0845 | 0.3588 | Training |
| 66 | 6.7907 | -1.3044 | -2.3926 | HoldOut |
| 67 | -1.4911 | 0.6826 | -1.1306 | Training |
| 68 | 0.4986 | -0.8558 | -0.3941 | Training |
| 69 | 1.4731 | 2.7616 | 0.6869 | HoldOut |
| 70 | -0.9833 | 0.4993 | -1.7042 | HoldOut |
| 71 | -0.2941 | 0.8048 | -1.573 | Training |
| 72 | -0.7258 | -1.5946 | -1.5258 | Training |
| 73 | -0.6203 | -0.5606 | 1.06 | Training |
| 74 | 0.732 | 3.8093 | 5.4591 | Training |
| 75 | 0.6797 | -0.7166 | 0.2328 | Training |
| 76 | -0.929 | 0.9011 | -1.218 | HoldOut |
| 77 | 2.292 | 1.709 | -1.4347 | Training |
| 78 | 3.1197 | 1.4594 | 3.1465 | HoldOut |
| 79 | 0.046 | -0.2256 | 0.9264 | HoldOut |
| 80 | 1.3558 | -0.3508 | 0.0258 | Training |
| 81 | 0.2876 | -0.6218 | 1.0881 | HoldOut |
| 82 | -0.9201 | 1.3065 | 0.0003 | Training |
| 83 | 0.285 | -0.386 | 0.7012 | Training |
| 84 | 2.1311 | 0.4933 | 0.8016 | Training |
| 85 | -0.2207 | 1.2409 | -1.0916 | Training |
| 86 | 0.7126 | 0.2331 | 0.8634 | Training |
| 87 | -1.0956 | -1.3579 | -0.6883 | Training |
| 88 | 2.9376 | 1.2908 | -2.0744 | HoldOut |
| 89 | 0.2821 | 2.088 | 1.3986 | Training |
| 90 | -0.9614 | 1.008 | -0.6259 | Training |
| 91 | 2.2997 | -1.0495 | -1.6501 | Training |
| 92 | 4.2601 | 2.0588 | -2.2526 | Training |
| 93 | -0.818 | -1.2119 | -0.6207 | Training |

| | | | | |
|---|---|---|---|---|
| 94 | -0.5879 | 1.6774 | 0.6984 | HoldOut |
| 95 | -0.5116 | -0.6978 | 0.7612 | Training |
| 96 | -0.7081 | -0.8776 | 0.4543 | HoldOut |
| 97 | 0.5989 | 0.2793 | 0.7414 | Training |
| 98 | -0.0714 | -0.4115 | 1.0116 | Training |
| 99 | 0.2942 | -0.9867 | -0.1762 | Training |
| 100 | -0.6146 | -1.3633 | -1.3072 | HoldOut |
| 101 | 0.1536 | 1.2997 | -1.6249 | Training |
| 102 | -0.2192 | 1.8812 | 1.172 | Training |
| 103 | 0.2391 | -0.3981 | 0.5403 | Training |
| 104 | -1.3163 | 0.9422 | -0.4927 | Training |
| 105 | 1.9002 | 2.6333 | 0.8148 | Training |
| 106 | 0.2071 | 0.7528 | 4.2587 | HoldOut |
| 107 | -0.1648 | -0.7679 | -0.4339 | Training |
| 108 | -0.0685 | 1.9193 | 0.9364 | HoldOut |
| 109 | 0.8123 | 1.5092 | -0.8698 | HoldOut |
| 110 | 0.2021 | 1.169 | -0.8727 | Training |
| 111 | 1.7651 | -1.0426 | -0.8215 | HoldOut |
| 112 | -0.7795 | -0.3659 | 1.7919 | HoldOut |
| 113 | -0.0796 | -0.6136 | 0.2012 | Training |
| 114 | -0.4909 | -0.2898 | 1.8033 | Training |
| 115 | -0.0294 | -0.6949 | -0.6047 | Training |
| 116 | -0.2791 | -0.6245 | 0.0085 | HoldOut |
| 117 | -0.1246 | -0.7326 | 0.0098 | Training |
| 118 | -0.3836 | 1.3901 | -0.3014 | Training |
| 119 | -0.9218 | 1.5113 | 0.8517 | HoldOut |
| 120 | 1.0494 | 1.9167 | -0.3848 | Training |
| 121 | -0.375 | 1.1817 | -0.9272 | Training |
| 122 | -1.371 | 0.7289 | -1.0087 | Training |
| 123 | 0.6655 | -0.3013 | -0.1605 | HoldOut |
| 124 | -0.0722 | 0.4242 | 3.2553 | Training |
| 125 | -1.423 | 0.6206 | -1.2416 | Training |
| 126 | -0.3821 | -0.4548 | 1.1638 | Training |
| 127 | -0.963 | 1.3374 | 0.2801 | Training |
| 128 | 2.5518 | 2.7809 | -0.3373 | Training |
| 129 | 0.4736 | -0.0596 | 1.8972 | Training |
| 130 | 2.8681 | -0.9995 | -2.2188 | Training |
| 131 | 0.7011 | 0.7829 | -2.1494 | Training |
| 132 | -0.9019 | -0.9751 | 0.0959 | Training |
| 133 | -0.8789 | 1.2489 | -0.4495 | Training |
| 134 | 7.4949 | 0.8428 | -1.9689 | Training |
| 135 | 0.1124 | -0.5152 | 0.4501 | Training |
| 136 | -0.7231 | 1.0985 | -1.8534 | Training |
| 137 | 0.5256 | -0.6873 | -0.2856 | HoldOut |
| 138 | -0.5203 | 0.715 | -1.2249 | Training |
| 139 | -0.8871 | -0.805 | 0.4273 | Training |
| 140 | 0.1039 | -0.5102 | 0.6698 | Training |
| 141 | 1.9327 | -1.1687 | -1.4245 | Training |

| | | | | |
|---|---|---|---|---|
| 142 | 3.9842 | 0.1206 | -1.9678 | Training |
| 143 | 0.3936 | -1.5001 | -1.4856 | Training |
| 144 | 0.784 | 2.7026 | 2.602 | Training |
| 145 | 0.3134 | -0.1307 | 1.6845 | HoldOut |
| 146 | 2.2251 | -0.5671 | -1.273 | Training |
| 147 | -0.2015 | -0.2793 | 0.5533 | Training |
| 148 | -0.4492 | 1.3123 | -0.6126 | Training |
| 149 | -0.0853 | -0.4938 | 0.7214 | Training |
| 150 | -0.8815 | -0.6921 | 0.9624 | Training |
| 151 | -0.5036 | -0.6212 | 0.566 | Training |
| 152 | -1.217 | 0.8435 | -0.797 | Training |
| 153 | -1.0643 | 0.9779 | -0.8536 | Training |
| 154 | 0.0054 | 1.4932 | -0.802 | Training |
| 155 | -0.7465 | 0.7552 | -1.4449 | Training |
| 156 | 0.0077 | 1.7164 | 0.6134 | Training |
| 157 | 10.0848 | 1.8379 | -2.9501 | HoldOut |
| 158 | 0.6211 | -0.9814 | -0.8059 | Training |
| 159 | -0.9277 | 1.2803 | -0.136 | Training |
| 160 | -0.9261 | 1.4041 | 0.3123 | HoldOut |
| 161 | 1.2158 | -1.5182 | -2.5238 | Training |
| 162 | 0.6786 | -0.6386 | -0.2163 | HoldOut |
| 163 | 1.4088 | 0.0159 | 0.783 | Training |
| 164 | 0.2252 | -0.8654 | -0.0126 | Training |
| 165 | 1.996 | 2.4564 | -0.5719 | Training |
| 166 | 1.2544 | 1.5709 | -0.7134 | HoldOut |
| 167 | -0.2966 | 1.3532 | -0.6721 | HoldOut |
| 168 | 1.1281 | -0.1277 | 1.253 | Training |
| 169 | 0.6248 | -0.0306 | 1.2831 | HoldOut |
| 170 | -1.1904 | 0.732 | -1.2667 | HoldOut |
| 171 | 0.3529 | -0.1273 | 1.0792 | Training |
| 172 | 0.9255 | -0.4814 | -0.4253 | Training |

# Appendix A4.3

*Fuzzy Cluster Report – Training*

**Cluster Medoids Section**

| **Variable** | **Cluster1** | **Cluster2** |
|---|---|---|
| Factor1 | 0.1124 | -0.4908 |
| Factor2 | -0.5152 | 1.2297 |
| Factor3 | 0.4501 | -0.6199 |
| Row | 95 135 | 43 64 |

**Membership Summary Section for Clusters = 2**

<table>
<tr><th>Row</th><th>Cluster</th><th>Cluster Membership</th><th>Sum of Squared Memberships</th><th>Bar of Squared Memberships</th><th>Silhouette Amount</th><th>Silhouette Bar</th></tr>
<tr><td>95 135</td><td>1</td><td>0.9658</td><td>0.9340</td><td>|IIIIIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.6556</td><td>|IIIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>9 12</td><td>1</td><td>0.9654</td><td>0.9333</td><td>|IIIIIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.6568</td><td>|IIIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>76 113</td><td>1</td><td>0.9650</td><td>0.9324</td><td>|IIIIIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.6562</td><td>|IIIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>51 75</td><td>1</td><td>0.9633</td><td>0.9293</td><td>|IIIIIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.6612</td><td>|IIIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>119 164</td><td>1</td><td>0.9628</td><td>0.9284</td><td>|IIIIIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.6656</td><td>|IIIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>79 117</td><td>1</td><td>0.9610</td><td>0.9251</td><td>|IIIIIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.6556</td><td>|IIIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>99 140</td><td>1</td><td>0.9600</td><td>0.9233</td><td>|IIIIIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.6511</td><td>|IIIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>22 34</td><td>1</td><td>0.9578</td><td>0.9192</td><td>|IIIIIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.6481</td><td>|IIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>71 103</td><td>1</td><td>0.9558</td><td>0.9155</td><td>|IIIIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.6371</td><td>|IIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>25 37</td><td>1</td><td>0.9552</td><td>0.9144</td><td>|IIIIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.6459</td><td>|IIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>107 149</td><td>1</td><td>0.9532</td><td>0.9107</td><td>|IIIIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.6419</td><td>|IIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>4 4</td><td>1</td><td>0.9523</td><td>0.9091</td><td>|IIIIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.6469</td><td>|IIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>68 99</td><td>1</td><td>0.9521</td><td>0.9088</td><td>|IIIIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.6556</td><td>|IIIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>55 83</td><td>1</td><td>0.9488</td><td>0.9029</td><td>|IIIIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.6310</td><td>|IIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>109 151</td><td>1</td><td>0.9473</td><td>0.9002</td><td>|IIIIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.6386</td><td>|IIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>35 52</td><td>1</td><td>0.9473</td><td>0.9002</td><td>|IIIIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.6286</td><td>|IIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>30 42</td><td>1</td><td>0.9434</td><td>0.8933</td><td>|IIIIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.6410</td><td>|IIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>46 68</td><td>1</td><td>0.9430</td><td>0.8925</td><td>|IIIIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.6363</td><td>|IIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>37 55</td><td>1</td><td>0.9430</td><td>0.8925</td><td>|IIIIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.6292</td><td>|IIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>34 49</td><td>1</td><td>0.9411</td><td>0.8891</td><td>|IIIIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.6232</td><td>|IIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>65 95</td><td>1</td><td>0.9399</td><td>0.8871</td><td>|IIIIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.6355</td><td>|IIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>7 10</td><td>1</td><td>0.9321</td><td>0.8733</td><td>|IIIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.6255</td><td>|IIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>74 107</td><td>1</td><td>0.9310</td><td>0.8715</td><td>|IIIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.6173</td><td>|IIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>12 15</td><td>1</td><td>0.9295</td><td>0.8689</td><td>|IIIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.6001</td><td>|IIIIIIIIIIIIIIIIII</td></tr>
<tr><td>14 20</td><td>1</td><td>0.9289</td><td>0.8678</td><td>|IIIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.6168</td><td>|IIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>98 139</td><td>1</td><td>0.9259</td><td>0.8628</td><td>|IIIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.6203</td><td>|IIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>67 98</td><td>1</td><td>0.9241</td><td>0.8597</td><td>|IIIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.6092</td><td>|IIIIIIIIIIIIIIIIII</td></tr>
<tr><td>105 147</td><td>1</td><td>0.9234</td><td>0.8586</td><td>|IIIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.5943</td><td>|IIIIIIIIIIIIIIIIII</td></tr>
<tr><td>92 132</td><td>1</td><td>0.9202</td><td>0.8532</td><td>|IIIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.6182</td><td>|IIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>16 22</td><td>1</td><td>0.9201</td><td>0.8530</td><td>|IIIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.5976</td><td>|IIIIIIIIIIIIIIIIII</td></tr>
<tr><td>2 2</td><td>1</td><td>0.9176</td><td>0.8488</td><td>|IIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.6081</td><td>|IIIIIIIIIIIIIIIIII</td></tr>
<tr><td>78 115</td><td>1</td><td>0.9106</td><td>0.8372</td><td>|IIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.5912</td><td>|IIIIIIIIIIIIIIIIII</td></tr>
<tr><td>29 41</td><td>1</td><td>0.9100</td><td>0.8362</td><td>|IIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.5889</td><td>|IIIIIIIIIIIIIIIIII</td></tr>
<tr><td>49 73</td><td>1</td><td>0.9069</td><td>0.8311</td><td>|IIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.5970</td><td>|IIIIIIIIIIIIIIIIII</td></tr>
<tr><td>1 1</td><td>1</td><td>0.9067</td><td>0.8308</td><td>|IIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.6061</td><td>|IIIIIIIIIIIIIIIIII</td></tr>
</table>

**Membership Summary Section for Clusters = 2**

<table>
<tr><th>Row</th><th>Cluster</th><th>Cluster Membership</th><th>Sum of Squared Memberships</th><th>Bar of Squared Memberships</th><th>Silhouette Amount</th><th>Silhouette Bar</th></tr>
<tr><td>26 38</td><td>1</td><td>0.9049</td><td>0.8279</td><td>|IIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.5821</td><td>|IIIIIIIIIIIIIIIII</td></tr>
<tr><td>28 40</td><td>1</td><td>0.9040</td><td>0.8265</td><td>|IIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.6034</td><td>|IIIIIIIIIIIIIIIIII</td></tr>
<tr><td>6 7</td><td>1</td><td>0.9028</td><td>0.8245</td><td>|IIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.5962</td><td>|IIIIIIIIIIIIIIIIII</td></tr>
<tr><td>108 150</td><td>1</td><td>0.9016</td><td>0.8226</td><td>|IIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.5947</td><td>|IIIIIIIIIIIIIIIIII</td></tr>
<tr><td>123 172</td><td>1</td><td>0.9016</td><td>0.8226</td><td>|IIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.5723</td><td>|IIIIIIIIIIIIIIIII</td></tr>
<tr><td>86 126</td><td>1</td><td>0.9016</td><td>0.8225</td><td>|IIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.5892</td><td>|IIIIIIIIIIIIIIIIII</td></tr>
<tr><td>39 58</td><td>1</td><td>0.8993</td><td>0.8189</td><td>|IIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.5897</td><td>|IIIIIIIIIIIIIIIIII</td></tr>
<tr><td>115 158</td><td>1</td><td>0.8988</td><td>0.8180</td><td>|IIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.5914</td><td>|IIIIIIIIIIIIIIIIII</td></tr>
<tr><td>36 54</td><td>1</td><td>0.8954</td><td>0.8126</td><td>|IIIIIIIIIIIIIIIIIIIIIIII</td><td>0.5866</td><td>|IIIIIIIIIIIIIIIIII</td></tr>
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<tr><td>32 46</td><td>1</td><td>0.8793</td><td>0.7877</td><td>|IIIIIIIIIIIIIIIIIIIIIIII</td><td>0.5683</td><td>|IIIIIIIIIIIIIIIII</td></tr>
<tr><td>64 93</td><td>1</td><td>0.8758</td><td>0.7825</td><td>|IIIIIIIIIIIIIIIIIIIIIII</td><td>0.5769</td><td>|IIIIIIIIIIIIIIIII</td></tr>
<tr><td>33 47</td><td>1</td><td>0.8731</td><td>0.7785</td><td>|IIIIIIIIIIIIIIIIIIIIIII</td><td>0.5779</td><td>|IIIIIIIIIIIIIIIII</td></tr>
<tr><td>11 14</td><td>1</td><td>0.8672</td><td>0.7696</td><td>|IIIIIIIIIIIIIIIIIIIIIII</td><td>0.5619</td><td>|IIIIIIIIIIIIIIIII</td></tr>
<tr><td>122 171</td><td>1</td><td>0.8669</td><td>0.7692</td><td>|IIIIIIIIIIIIIIIIIIIIIII</td><td>0.5450</td><td>|IIIIIIIIIIIIIIII</td></tr>
<tr><td>40 60</td><td>1</td><td>0.8574</td><td>0.7555</td><td>|IIIIIIIIIIIIIIIIIIIIIII</td><td>0.5357</td><td>|IIIIIIIIIIIIIIII</td></tr>
<tr><td>44 65</td><td>1</td><td>0.8510</td><td>0.7463</td><td>|IIIIIIIIIIIIIIIIIIIIII</td><td>0.5200</td><td>|IIIIIIIIIIIIIIII</td></tr>
<tr><td>59 87</td><td>1</td><td>0.8467</td><td>0.7403</td><td>|IIIIIIIIIIIIIIIIIIIIII</td><td>0.5505</td><td>|IIIIIIIIIIIIIIIII</td></tr>
<tr><td>19 29</td><td>1</td><td>0.8462</td><td>0.7398</td><td>|IIIIIIIIIIIIIIIIIIIIII</td><td>0.5253</td><td>|IIIIIIIIIIIIIIII</td></tr>
<tr><td>3 3</td><td>1</td><td>0.8303</td><td>0.7182</td><td>|IIIIIIIIIIIIIIIIIIIIII</td><td>0.5096</td><td>|IIIIIIIIIIIIIII</td></tr>
<tr><td>10 13</td><td>1</td><td>0.8298</td><td>0.7175</td><td>|IIIIIIIIIIIIIIIIIIIIII</td><td>0.5335</td><td>|IIIIIIIIIIIIIIII</td></tr>
<tr><td>121 168</td><td>1</td><td>0.8252</td><td>0.7115</td><td>|IIIIIIIIIIIIIIIIIIIII</td><td>0.5084</td><td>|IIIIIIIIIIIIIII</td></tr>
<tr><td>27 39</td><td>1</td><td>0.8246</td><td>0.7107</td><td>|IIIIIIIIIIIIIIIIIIIII</td><td>0.4976</td><td>|IIIIIIIIIIIIIII</td></tr>
<tr><td>102 143</td><td>1</td><td>0.8011</td><td>0.6813</td><td>|IIIIIIIIIIIIIIIIIIII</td><td>0.5044</td><td>|IIIIIIIIIIIIIII</td></tr>
<tr><td>118 163</td><td>1</td><td>0.7926</td><td>0.6712</td><td>|IIIIIIIIIIIIIIIIIIII</td><td>0.4737</td><td>|IIIIIIIIIIIIII</td></tr>
<tr><td>77 114</td><td>1</td><td>0.7910</td><td>0.6694</td><td>|IIIIIIIIIIIIIIIIIIII</td><td>0.4845</td><td>|IIIIIIIIIIIIIII</td></tr>
<tr><td>48 72</td><td>1</td><td>0.7739</td><td>0.6500</td><td>|IIIIIIIIIIIIIIIIIIII</td><td>0.4787</td><td>|IIIIIIIIIIIIII</td></tr>
<tr><td>100 141</td><td>1</td><td>0.7719</td><td>0.6478</td><td>|IIIIIIIIIIIIIIIIIII</td><td>0.4665</td><td>|IIIIIIIIIIIIII</td></tr>
<tr><td>38 56</td><td>1</td><td>0.7548</td><td>0.6298</td><td>|IIIIIIIIIIIIIIIIIII</td><td>0.4590</td><td>|IIIIIIIIIIIIII</td></tr>
<tr><td>89 129</td><td>1</td><td>0.7519</td><td>0.6269</td><td>|IIIIIIIIIIIIIIIIIII</td><td>0.4439</td><td>|IIIIIIIIIIIII</td></tr>
<tr><td>8 11</td><td>1</td><td>0.7451</td><td>0.6201</td><td>|IIIIIIIIIIIIIIIIIII</td><td>0.4391</td><td>|IIIIIIIIIIIII</td></tr>
<tr><td>62 91</td><td>1</td><td>0.7226</td><td>0.5991</td><td>|IIIIIIIIIIIIIIIIII</td><td>0.4124</td><td>|IIIIIIIIIIII</td></tr>
<tr><td>58 86</td><td>1</td><td>0.7180</td><td>0.5950</td><td>|IIIIIIIIIIIIIIIIII</td><td>0.4172</td><td>|IIIIIIIIIIIII</td></tr>
<tr><td>104 146</td><td>1</td><td>0.7106</td><td>0.5887</td><td>|IIIIIIIIIIIIIIIIII</td><td>0.3958</td><td>|IIIIIIIIIIII</td></tr>
<tr><td>66 97</td><td>1</td><td>0.6851</td><td>0.5685</td><td>|IIIIIIIIIIIIIIIII</td><td>0.3937</td><td>|IIIIIIIIIIII</td></tr>
<tr><td>117 161</td><td>1</td><td>0.6787</td><td>0.5639</td><td>|IIIIIIIIIIIIIIIII</td><td>0.3678</td><td>|IIIIIIIIIII</td></tr>
<tr><td>90 130</td><td>1</td><td>0.6405</td><td>0.5395</td><td>|IIIIIIIIIIIIIIII</td><td>0.3136</td><td>|IIIIIIIII</td></tr>
<tr><td>41 61</td><td>1</td><td>0.5818</td><td>0.5134</td><td>|IIIIIIIIIIIIIII</td><td>0.2110</td><td>|IIIIII</td></tr>
<tr><td>84 124</td><td>1</td><td>0.5728</td><td>0.5106</td><td>|IIIIIIIIIIIIIII</td><td>0.2350</td><td>|IIIIIII</td></tr>
<tr><td>56 84</td><td>1</td><td>0.5518</td><td>0.5054</td><td>|IIIIIIIIIIIIIII</td><td>0.2481</td><td>|IIIIIII</td></tr>
<tr><td>43 64</td><td>2</td><td>0.9691</td><td>0.9401</td><td>|IIIIIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.3617</td><td>|IIIIIIIIIII</td></tr>
<tr><td>106 148</td><td>2</td><td>0.9680</td><td>0.9380</td><td>|IIIIIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.3761</td><td>|IIIIIIIIIII</td></tr>
</table>

**Membership Summary Section for Clusters = 2**

<table>
<tr><th>Row</th><th>Cluster</th><th>Cluster Membership</th><th>Sum of Squared Memberships</th><th>Bar of Squared Memberships</th><th>Silhouette Amount</th><th>Silhouette Bar</th></tr>
<tr><td>82 121</td><td>2</td><td>0.9649</td><td>0.9322</td><td>|||||||||||||||||||||||||||||</td><td>0.3600</td><td>||||||||||||</td></tr>
<tr><td>17 26</td><td>2</td><td>0.9596</td><td>0.9224</td><td>|||||||||||||||||||||||||||||</td><td>0.2926</td><td>||||||||||</td></tr>
<tr><td>93 133</td><td>2</td><td>0.9585</td><td>0.9204</td><td>|||||||||||||||||||||||||||||</td><td>0.3440</td><td>|||||||||||</td></tr>
<tr><td>20 31</td><td>2</td><td>0.9577</td><td>0.9189</td><td>|||||||||||||||||||||||||||||</td><td>0.2904</td><td>||||||||||</td></tr>
<tr><td>57 85</td><td>2</td><td>0.9576</td><td>0.9188</td><td>|||||||||||||||||||||||||||||</td><td>0.3676</td><td>||||||||||||</td></tr>
<tr><td>80 118</td><td>2</td><td>0.9570</td><td>0.9178</td><td>|||||||||||||||||||||||||||||</td><td>0.3593</td><td>||||||||||||</td></tr>
<tr><td>112 154</td><td>2</td><td>0.9557</td><td>0.9153</td><td>||||||||||||||||||||||||||||</td><td>0.3949</td><td>|||||||||||||</td></tr>
<tr><td>21 32</td><td>2</td><td>0.9552</td><td>0.9144</td><td>||||||||||||||||||||||||||||</td><td>0.3278</td><td>|||||||||||</td></tr>
<tr><td>5 6</td><td>2</td><td>0.9551</td><td>0.9142</td><td>||||||||||||||||||||||||||||</td><td>0.2913</td><td>||||||||||</td></tr>
<tr><td>61 90</td><td>2</td><td>0.9533</td><td>0.9109</td><td>||||||||||||||||||||||||||||</td><td>0.2936</td><td>||||||||||</td></tr>
<tr><td>75 110</td><td>2</td><td>0.9521</td><td>0.9088</td><td>||||||||||||||||||||||||||||</td><td>0.3308</td><td>|||||||||||</td></tr>
<tr><td>13 19</td><td>2</td><td>0.9482</td><td>0.9017</td><td>||||||||||||||||||||||||||||</td><td>0.2936</td><td>||||||||||</td></tr>
<tr><td>111 153</td><td>2</td><td>0.9454</td><td>0.8968</td><td>||||||||||||||||||||||||||||</td><td>0.2923</td><td>||||||||||</td></tr>
<tr><td>116 159</td><td>2</td><td>0.9388</td><td>0.8852</td><td>||||||||||||||||||||||||||||</td><td>0.3093</td><td>||||||||||</td></tr>
<tr><td>54 82</td><td>2</td><td>0.9269</td><td>0.8645</td><td>|||||||||||||||||||||||||||</td><td>0.2941</td><td>||||||||||</td></tr>
<tr><td>110 152</td><td>2</td><td>0.9211</td><td>0.8546</td><td>|||||||||||||||||||||||||||</td><td>0.2303</td><td>||||||||</td></tr>
<tr><td>72 104</td><td>2</td><td>0.9199</td><td>0.8526</td><td>|||||||||||||||||||||||||||</td><td>0.2347</td><td>||||||||</td></tr>
<tr><td>69 101</td><td>2</td><td>0.9142</td><td>0.8431</td><td>||||||||||||||||||||||||||</td><td>0.3432</td><td>|||||||||||</td></tr>
<tr><td>15 21</td><td>2</td><td>0.9087</td><td>0.8341</td><td>||||||||||||||||||||||||||</td><td>0.2130</td><td>|||||||</td></tr>
<tr><td>97 138</td><td>2</td><td>0.8993</td><td>0.8188</td><td>||||||||||||||||||||||||||</td><td>0.1926</td><td>|||||||</td></tr>
<tr><td>81 120</td><td>2</td><td>0.8933</td><td>0.8094</td><td>|||||||||||||||||||||||||</td><td>0.3655</td><td>||||||||||||</td></tr>
<tr><td>87 127</td><td>2</td><td>0.8921</td><td>0.8074</td><td>|||||||||||||||||||||||||</td><td>0.2515</td><td>|||||||||</td></tr>
<tr><td>113 155</td><td>2</td><td>0.8901</td><td>0.8044</td><td>|||||||||||||||||||||||||</td><td>0.2150</td><td>|||||||</td></tr>
<tr><td>96 136</td><td>2</td><td>0.8887</td><td>0.8022</td><td>|||||||||||||||||||||||||</td><td>0.2964</td><td>||||||||||</td></tr>
<tr><td>47 71</td><td>2</td><td>0.8877</td><td>0.8006</td><td>|||||||||||||||||||||||||</td><td>0.2268</td><td>||||||||</td></tr>
<tr><td>83 122</td><td>2</td><td>0.8844</td><td>0.7955</td><td>|||||||||||||||||||||||||</td><td>0.1835</td><td>|||||||</td></tr>
<tr><td>114 156</td><td>2</td><td>0.8627</td><td>0.7632</td><td>||||||||||||||||||||||||</td><td>0.2785</td><td>|||||||||</td></tr>
<tr><td>45 67</td><td>2</td><td>0.8604</td><td>0.7598</td><td>||||||||||||||||||||||||</td><td>0.1618</td><td>||||||</td></tr>
<tr><td>85 125</td><td>2</td><td>0.8436</td><td>0.7361</td><td>|||||||||||||||||||||||</td><td>0.1387</td><td>|||||</td></tr>
<tr><td>31 43</td><td>2</td><td>0.8430</td><td>0.7353</td><td>|||||||||||||||||||||||</td><td>0.3355</td><td>|||||||||||</td></tr>
<tr><td>120 165</td><td>2</td><td>0.8266</td><td>0.7133</td><td>||||||||||||||||||||||</td><td>0.3484</td><td>|||||||||||</td></tr>
<tr><td>52 77</td><td>2</td><td>0.8171</td><td>0.7011</td><td>||||||||||||||||||||||</td><td>0.2973</td><td>||||||||||</td></tr>
<tr><td>70 102</td><td>2</td><td>0.7983</td><td>0.6779</td><td>|||||||||||||||||||||</td><td>0.2294</td><td>||||||||</td></tr>
<tr><td>91 131</td><td>2</td><td>0.7915</td><td>0.6700</td><td>|||||||||||||||||||||</td><td>0.1683</td><td>||||||</td></tr>
<tr><td>88 128</td><td>2</td><td>0.7854</td><td>0.6629</td><td>|||||||||||||||||||||</td><td>0.3213</td><td>|||||||||||</td></tr>
<tr><td>73 105</td><td>2</td><td>0.7731</td><td>0.6492</td><td>||||||||||||||||||||</td><td>0.2859</td><td>||||||||||</td></tr>
<tr><td>60 89</td><td>2</td><td>0.7728</td><td>0.6488</td><td>||||||||||||||||||||</td><td>0.2277</td><td>||||||||</td></tr>
<tr><td>23 35</td><td>2</td><td>0.7280</td><td>0.6039</td><td>|||||||||||||||||||</td><td>0.0414</td><td>||</td></tr>
<tr><td>63 92</td><td>2</td><td>0.7042</td><td>0.5834</td><td>|||||||||||||||||||</td><td>0.2287</td><td>||||||||</td></tr>
<tr><td>103 144</td><td>2</td><td>0.6775</td><td>0.5630</td><td>||||||||||||||||||</td><td>0.1685</td><td>||||||</td></tr>
<tr><td>50 74</td><td>2</td><td>0.5864</td><td>0.5149</td><td>||||||||||||||||</td><td>0.0865</td><td>||||</td></tr>
<tr><td>94 134</td><td>2</td><td>0.5542</td><td>0.5059</td><td>||||||||||||||||</td><td>0.0266</td><td>||</td></tr>
</table>

**Membership Summary Section for Clusters = 2**

| Row | Cluster | Cluster Membership | Sum of Squared Memberships | Bar of Squared Memberships | Silhouette Amount | Silhouette Bar |
|---|---|---|---|---|---|---|
| 101 142 | 2 | 0.5228 | 0.5010 | \|IIIIIIIIIIIIIII | -0.1031 | \| |
| 18 27 | 2 | 0.5203 | 0.5008 | \|IIIIIIIIIIIIIII | 0.0244 | \|I |
| 42 63 | 2 | 0.5056 | 0.5001 | \|IIIIIIIIIIIIIII | -0.1057 | \| |
| 24 36 | 2 | 0.5018 | 0.5000 | \|IIIIIIIIIIIIIII | -0.1777 | \| |

**Membership Matrix Section**

| Row | Cluster | Prob in 1 | Prob in 2 |
|---|---|---|---|
| 1 1 | 1 | 0.9067 | 0.0933 |
| 2 2 | 1 | 0.9176 | 0.0824 |
| 3 3 | 1 | 0.8303 | 0.1697 |
| 4 4 | 1 | 0.9523 | 0.0477 |
| 5 6 | 2 | 0.0449 | 0.9551 |
| 6 7 | 1 | 0.9028 | 0.0972 |
| 7 10 | 1 | 0.9321 | 0.0679 |
| 8 11 | 1 | 0.7451 | 0.2549 |
| 9 12 | 1 | 0.9654 | 0.0346 |
| 10 13 | 1 | 0.8298 | 0.1702 |
| 11 14 | 1 | 0.8672 | 0.1328 |
| 12 15 | 1 | 0.9295 | 0.0705 |
| 13 19 | 2 | 0.0518 | 0.9482 |
| 14 20 | 1 | 0.9289 | 0.0711 |
| 15 21 | 2 | 0.0913 | 0.9087 |
| 16 22 | 1 | 0.9201 | 0.0799 |
| 17 26 | 2 | 0.0404 | 0.9596 |
| 18 27 | 2 | 0.4797 | 0.5203 |
| 19 29 | 1 | 0.8462 | 0.1538 |
| 20 31 | 2 | 0.0423 | 0.9577 |
| 21 32 | 2 | 0.0448 | 0.9552 |
| 22 34 | 1 | 0.9578 | 0.0422 |
| 23 35 | 2 | 0.2720 | 0.7280 |
| 24 36 | 2 | 0.4982 | 0.5018 |
| 25 37 | 1 | 0.9552 | 0.0448 |
| 26 38 | 1 | 0.9049 | 0.0951 |
| 27 39 | 1 | 0.8246 | 0.1754 |
| 28 40 | 1 | 0.9040 | 0.0960 |
| 29 41 | 1 | 0.9100 | 0.0900 |
| 30 42 | 1 | 0.9434 | 0.0566 |
| 31 43 | 2 | 0.1570 | 0.8430 |
| 32 46 | 1 | 0.8793 | 0.1207 |
| 33 47 | 1 | 0.8731 | 0.1269 |
| 34 49 | 1 | 0.9411 | 0.0589 |
| 35 52 | 1 | 0.9473 | 0.0527 |

**Membership Matrix Section**

| Row | Cluster | Prob in 1 | Prob in 2 |
|---|---|---|---|
| 36 54 | 1 | 0.8954 | 0.1046 |
| 37 55 | 1 | 0.9430 | 0.0570 |
| 38 56 | 1 | 0.7548 | 0.2452 |
| 39 58 | 1 | 0.8993 | 0.1007 |
| 40 60 | 1 | 0.8574 | 0.1426 |
| 41 61 | 1 | 0.5818 | 0.4182 |
| 42 63 | 2 | 0.4944 | 0.5056 |
| 43 64 | 2 | 0.0309 | 0.9691 |
| 44 65 | 1 | 0.8510 | 0.1490 |
| 45 67 | 2 | 0.1396 | 0.8604 |
| 46 68 | 1 | 0.9430 | 0.0570 |
| 47 71 | 2 | 0.1123 | 0.8877 |
| 48 72 | 1 | 0.7739 | 0.2261 |
| 49 73 | 1 | 0.9069 | 0.0931 |
| 50 74 | 2 | 0.4136 | 0.5864 |
| 51 75 | 1 | 0.9633 | 0.0367 |
| 52 77 | 2 | 0.1829 | 0.8171 |
| 53 80 | 1 | 0.8909 | 0.1091 |
| 54 82 | 2 | 0.0731 | 0.9269 |
| 55 83 | 1 | 0.9488 | 0.0512 |
| 56 84 | 1 | 0.5518 | 0.4482 |
| 57 85 | 2 | 0.0424 | 0.9576 |
| 58 86 | 1 | 0.7180 | 0.2820 |
| 59 87 | 1 | 0.8467 | 0.1533 |
| 60 89 | 2 | 0.2272 | 0.7728 |
| 61 90 | 2 | 0.0467 | 0.9533 |
| 62 91 | 1 | 0.7226 | 0.2774 |
| 63 92 | 2 | 0.2958 | 0.7042 |
| 64 93 | 1 | 0.8758 | 0.1242 |
| 65 95 | 1 | 0.9399 | 0.0601 |
| 66 97 | 1 | 0.6851 | 0.3149 |
| 67 98 | 1 | 0.9241 | 0.0759 |
| 68 99 | 1 | 0.9521 | 0.0479 |
| 69 101 | 2 | 0.0858 | 0.9142 |
| 70 102 | 2 | 0.2017 | 0.7983 |
| 71 103 | 1 | 0.9558 | 0.0442 |
| 72 104 | 2 | 0.0801 | 0.9199 |
| 73 105 | 2 | 0.2269 | 0.7731 |
| 74 107 | 1 | 0.9310 | 0.0690 |
| 75 110 | 2 | 0.0479 | 0.9521 |
| 76 113 | 1 | 0.9650 | 0.0350 |
| 77 114 | 1 | 0.7910 | 0.2090 |
| 78 115 | 1 | 0.9106 | 0.0894 |
| 79 117 | 1 | 0.9610 | 0.0390 |

**Membership Matrix Section**

| Row | Cluster | Prob in 1 | Prob in 2 |
|---|---|---|---|
| 80 118 | 2 | 0.0430 | 0.9570 |
| 81 120 | 2 | 0.1067 | 0.8933 |
| 82 121 | 2 | 0.0351 | 0.9649 |
| 83 122 | 2 | 0.1156 | 0.8844 |
| 84 124 | 1 | 0.5728 | 0.4272 |
| 85 125 | 2 | 0.1564 | 0.8436 |
| 86 126 | 1 | 0.9016 | 0.0984 |
| 87 127 | 2 | 0.1079 | 0.8921 |
| 88 128 | 2 | 0.2146 | 0.7854 |
| 89 129 | 1 | 0.7519 | 0.2481 |
| 90 130 | 1 | 0.6405 | 0.3595 |
| 91 131 | 2 | 0.2085 | 0.7915 |
| 92 132 | 1 | 0.9202 | 0.0798 |
| 93 133 | 2 | 0.0415 | 0.9585 |
| 94 134 | 2 | 0.4458 | 0.5542 |
| 95 135 | 1 | 0.9658 | 0.0342 |
| 96 136 | 2 | 0.1113 | 0.8887 |
| 97 138 | 2 | 0.1007 | 0.8993 |
| 98 139 | 1 | 0.9259 | 0.0741 |
| 99 140 | 1 | 0.9600 | 0.0400 |
| 100 141 | 1 | 0.7719 | 0.2281 |
| 101 142 | 2 | 0.4772 | 0.5228 |
| 102 143 | 1 | 0.8011 | 0.1989 |
| 103 144 | 2 | 0.3225 | 0.6775 |
| 104 146 | 1 | 0.7106 | 0.2894 |
| 105 147 | 1 | 0.9234 | 0.0766 |
| 106 148 | 2 | 0.0320 | 0.9680 |
| 107 149 | 1 | 0.9532 | 0.0468 |
| 108 150 | 1 | 0.9016 | 0.0984 |
| 109 151 | 1 | 0.9473 | 0.0527 |
| 110 152 | 2 | 0.0789 | 0.9211 |
| 111 153 | 2 | 0.0546 | 0.9454 |
| 112 154 | 2 | 0.0443 | 0.9557 |
| 113 155 | 2 | 0.1099 | 0.8901 |
| 114 156 | 2 | 0.1373 | 0.8627 |
| 115 158 | 1 | 0.8988 | 0.1012 |
| 116 159 | 2 | 0.0612 | 0.9388 |
| 117 161 | 1 | 0.6787 | 0.3213 |
| 118 163 | 1 | 0.7926 | 0.2074 |
| 119 164 | 1 | 0.9628 | 0.0372 |
| 120 165 | 2 | 0.1734 | 0.8266 |
| 121 168 | 1 | 0.8252 | 0.1748 |
| 122 171 | 1 | 0.8669 | 0.1331 |
| 123 172 | 1 | 0.9016 | 0.0984 |

**Cluster Medoids Section**

| Variable | Cluster1 | Cluster2 | Cluster3 |
|---|---|---|---|
| Factor1 | 0.285 | -0.4908 | 0.6211 |
| Factor2 | -0.386 | 1.2297 | -0.9814 |
| Factor3 | 0.7012 | -0.6199 | -0.8059 |
| Row | 55 83 | 43 64 | 115 158 |

**Membership Summary Section for Clusters = 3**

| Row | Cluster | Cluster Membership | Sum of Squared Memberships | Bar of Squared Memberships | Silhouette Amount | Silhouette Bar |
|---|---|---|---|---|---|---|
| 55 83 | 1 | 0.9478 | 0.9001 | \|IIIIIIIIIIIIIIIIIIIIIIIIIII | 0.7205 | \|IIIIIIIIIIIIIIIIIIIIII |
| 22 34 | 1 | 0.9465 | 0.8979 | \|IIIIIIIIIIIIIIIIIIIIIIIIIII | 0.7190 | \|IIIIIIIIIIIIIIIIIIIIII |
| 99 140 | 1 | 0.9442 | 0.8936 | \|IIIIIIIIIIIIIIIIIIIIIIIIIII | 0.7153 | \|IIIIIIIIIIIIIIIIIIIII |
| 107 149 | 1 | 0.9437 | 0.8927 | \|IIIIIIIIIIIIIIIIIIIIIIIIIII | 0.7195 | \|IIIIIIIIIIIIIIIIIIIIII |
| 67 98 | 1 | 0.9393 | 0.8844 | \|IIIIIIIIIIIIIIIIIIIIIIIIIII | 0.7274 | \|IIIIIIIIIIIIIIIIIIIIII |
| 71 103 | 1 | 0.9320 | 0.8717 | \|IIIIIIIIIIIIIIIIIIIIIIIIII | 0.7018 | \|IIIIIIIIIIIIIIIIIIIII |
| 26 38 | 1 | 0.9253 | 0.8594 | \|IIIIIIIIIIIIIIIIIIIIIIIIII | 0.7136 | \|IIIIIIIIIIIIIIIIIIIII |
| 9 12 | 1 | 0.9144 | 0.8414 | \|IIIIIIIIIIIIIIIIIIIIIIIII | 0.6877 | \|IIIIIIIIIIIIIIIIIIIII |
| 122 171 | 1 | 0.9064 | 0.8262 | \|IIIIIIIIIIIIIIIIIIIIIIIII | 0.6927 | \|IIIIIIIIIIIIIIIIIIIII |
| 86 126 | 1 | 0.9061 | 0.8261 | \|IIIIIIIIIIIIIIIIIIIIIIIII | 0.7074 | \|IIIIIIIIIIIIIIIIIIIII |
| 105 147 | 1 | 0.9059 | 0.8259 | \|IIIIIIIIIIIIIIIIIIIIIIIII | 0.6925 | \|IIIIIIIIIIIIIIIIIIIII |
| 95 135 | 1 | 0.9047 | 0.8250 | \|IIIIIIIIIIIIIIIIIIIIIIIII | 0.6793 | \|IIIIIIIIIIIIIIIIIIII |
| 14 20 | 1 | 0.8992 | 0.8151 | \|IIIIIIIIIIIIIIIIIIIIIIII | 0.6854 | \|IIIIIIIIIIIIIIIIIIIII |
| 39 58 | 1 | 0.8936 | 0.8050 | \|IIIIIIIIIIIIIIIIIIIIIIII | 0.6983 | \|IIIIIIIIIIIIIIIIIIIII |
| 37 55 | 1 | 0.8875 | 0.7959 | \|IIIIIIIIIIIIIIIIIIIIIIII | 0.6803 | \|IIIIIIIIIIIIIIIIIIII |
| 32 46 | 1 | 0.8870 | 0.7938 | \|IIIIIIIIIIIIIIIIIIIIIIII | 0.6970 | \|IIIIIIIIIIIIIIIIIIIII |
| 16 22 | 1 | 0.8867 | 0.7942 | \|IIIIIIIIIIIIIIIIIIIIIIII | 0.6743 | \|IIIIIIIIIIIIIIIIIIII |
| 36 54 | 1 | 0.8809 | 0.7842 | \|IIIIIIIIIIIIIIIIIIIIIIII | 0.6896 | \|IIIIIIIIIIIIIIIIIIIII |
| 49 73 | 1 | 0.8798 | 0.7827 | \|IIIIIIIIIIIIIIIIIIIIIII | 0.6863 | \|IIIIIIIIIIIIIIIIIIIII |
| 35 52 | 1 | 0.8712 | 0.7706 | \|IIIIIIIIIIIIIIIIIIIIIII | 0.6569 | \|IIIIIIIIIIIIIIIIIIII |
| 65 95 | 1 | 0.8651 | 0.7606 | \|IIIIIIIIIIIIIIIIIIIIIII | 0.6677 | \|IIIIIIIIIIIIIIIIIIII |
| 3 3 | 1 | 0.8640 | 0.7562 | \|IIIIIIIIIIIIIIIIIIIIIII | 0.6517 | \|IIIIIIIIIIIIIIIIIIII |
| 109 151 | 1 | 0.8611 | 0.7547 | \|IIIIIIIIIIIIIIIIIIIIIII | 0.6626 | \|IIIIIIIIIIIIIIIIIIII |
| 40 60 | 1 | 0.8549 | 0.7424 | \|IIIIIIIIIIIIIIIIIIIIII | 0.6651 | \|IIIIIIIIIIIIIIIIIIII |
| 121 168 | 1 | 0.8210 | 0.6913 | \|IIIIIIIIIIIIIIIIIIIII | 0.6405 | \|IIIIIIIIIIIIIIIIIII |
| 108 150 | 1 | 0.8172 | 0.6884 | \|IIIIIIIIIIIIIIIIIIIII | 0.6428 | \|IIIIIIIIIIIIIIIIIII |
| 77 114 | 1 | 0.7849 | 0.6400 | \|IIIIIIIIIIIIIIIIIII | 0.6126 | \|IIIIIIIIIIIIIIIIII |
| 4 4 | 1 | 0.7640 | 0.6253 | \|IIIIIIIIIIIIIIIIIII | 0.6054 | \|IIIIIIIIIIIIIIIIII |
| 89 129 | 1 | 0.7612 | 0.6083 | \|IIIIIIIIIIIIIIIIII | 0.5809 | \|IIIIIIIIIIIIIIIII |
| 58 86 | 1 | 0.7589 | 0.6050 | \|IIIIIIIIIIIIIIIIII | 0.5450 | \|IIIIIIIIIIIIIIII |
| 118 163 | 1 | 0.7449 | 0.5897 | \|IIIIIIIIIIIIIIIIII | 0.5810 | \|IIIIIIIIIIIIIIIII |
| 76 113 | 1 | 0.7443 | 0.6058 | \|IIIIIIIIIIIIIIIIII | 0.5924 | \|IIIIIIIIIIIIIIIIII |
| 25 37 | 1 | 0.7397 | 0.6004 | \|IIIIIIIIIIIIIIIIII | 0.5787 | \|IIIIIIIIIIIIIIIII |
| 44 65 | 1 | 0.7311 | 0.5771 | \|IIIIIIIIIIIIIIIII | 0.5799 | \|IIIIIIIIIIIIIIIII |
| 66 97 | 1 | 0.7254 | 0.5640 | \|IIIIIIIIIIIIIIIII | 0.5111 | \|IIIIIIIIIIIIIII |

**Membership Summary Section for Clusters = 3**

<table>
<tr><th>Row</th><th>Cluster</th><th>Cluster Membership</th><th>Sum of Squared Memberships</th><th>Bar of Squared Memberships</th><th>Silhouette Amount</th><th>Silhouette Bar</th></tr>
<tr><td>98 139</td><td>1</td><td>0.6949</td><td>0.5496</td><td>|||||||||||||||||</td><td>0.5661</td><td>||||||||||||||||||</td></tr>
<tr><td>51 75</td><td>1</td><td>0.6384</td><td>0.5175</td><td>|||||||||||||||||</td><td>0.5318</td><td>|||||||||||||||||</td></tr>
<tr><td>27 39</td><td>1</td><td>0.6347</td><td>0.4838</td><td>||||||||||||||||</td><td>0.5122</td><td>||||||||||||||||</td></tr>
<tr><td>30 42</td><td>1</td><td>0.5486</td><td>0.4664</td><td>|||||||||||||||</td><td>0.4878</td><td>||||||||||||||||</td></tr>
<tr><td>84 124</td><td>1</td><td>0.5368</td><td>0.3962</td><td>|||||||||||||</td><td>0.3280</td><td>|||||||||||</td></tr>
<tr><td>12 15</td><td>1</td><td>0.5318</td><td>0.4580</td><td>|||||||||||||||</td><td>0.4711</td><td>|||||||||||||||</td></tr>
<tr><td>79 117</td><td>1</td><td>0.5249</td><td>0.4686</td><td>|||||||||||||||</td><td>0.4880</td><td>||||||||||||||||</td></tr>
<tr><td>53 80</td><td>1</td><td>0.5220</td><td>0.4436</td><td>||||||||||||||</td><td>0.4435</td><td>||||||||||||||</td></tr>
<tr><td>56 84</td><td>1</td><td>0.5074</td><td>0.3791</td><td>||||||||||||</td><td>0.3208</td><td>|||||||||||</td></tr>
<tr><td>28 40</td><td>1</td><td>0.4969</td><td>0.4405</td><td>||||||||||||||</td><td>0.4279</td><td>||||||||||||||</td></tr>
<tr><td>92 132</td><td>1</td><td>0.4875</td><td>0.4461</td><td>||||||||||||||</td><td>0.4351</td><td>||||||||||||||</td></tr>
<tr><td>43 64</td><td>2</td><td>0.9673</td><td>0.9362</td><td>|||||||||||||||||||||||||||||</td><td>0.5112</td><td>||||||||||||||||</td></tr>
<tr><td>106 148</td><td>2</td><td>0.9647</td><td>0.9312</td><td>|||||||||||||||||||||||||||||</td><td>0.5210</td><td>|||||||||||||||||</td></tr>
<tr><td>82 121</td><td>2</td><td>0.9577</td><td>0.9181</td><td>|||||||||||||||||||||||||||||</td><td>0.5119</td><td>||||||||||||||||</td></tr>
<tr><td>17 26</td><td>2</td><td>0.9546</td><td>0.9123</td><td>||||||||||||||||||||||||||||</td><td>0.4523</td><td>|||||||||||||||</td></tr>
<tr><td>93 133</td><td>2</td><td>0.9544</td><td>0.9119</td><td>||||||||||||||||||||||||||||</td><td>0.4912</td><td>||||||||||||||||</td></tr>
<tr><td>20 31</td><td>2</td><td>0.9532</td><td>0.9097</td><td>||||||||||||||||||||||||||||</td><td>0.4473</td><td>||||||||||||||</td></tr>
<tr><td>5 6</td><td>2</td><td>0.9505</td><td>0.9046</td><td>||||||||||||||||||||||||||||</td><td>0.4526</td><td>|||||||||||||||</td></tr>
<tr><td>61 90</td><td>2</td><td>0.9483</td><td>0.9006</td><td>||||||||||||||||||||||||||||</td><td>0.4544</td><td>|||||||||||||||</td></tr>
<tr><td>80 118</td><td>2</td><td>0.9458</td><td>0.8960</td><td>||||||||||||||||||||||||||||</td><td>0.4916</td><td>||||||||||||||||</td></tr>
<tr><td>57 85</td><td>2</td><td>0.9418</td><td>0.8888</td><td>||||||||||||||||||||||||||||</td><td>0.5132</td><td>||||||||||||||||</td></tr>
<tr><td>21 32</td><td>2</td><td>0.9383</td><td>0.8823</td><td>|||||||||||||||||||||||||||</td><td>0.4582</td><td>|||||||||||||||</td></tr>
<tr><td>112 154</td><td>2</td><td>0.9368</td><td>0.8795</td><td>|||||||||||||||||||||||||||</td><td>0.5238</td><td>|||||||||||||||||</td></tr>
<tr><td>111 153</td><td>2</td><td>0.9347</td><td>0.8757</td><td>|||||||||||||||||||||||||||</td><td>0.4574</td><td>|||||||||||||||</td></tr>
<tr><td>13 19</td><td>2</td><td>0.9331</td><td>0.8730</td><td>|||||||||||||||||||||||||||</td><td>0.4262</td><td>||||||||||||||</td></tr>
<tr><td>75 110</td><td>2</td><td>0.9271</td><td>0.8623</td><td>|||||||||||||||||||||||||||</td><td>0.4692</td><td>|||||||||||||||</td></tr>
<tr><td>116 159</td><td>2</td><td>0.9224</td><td>0.8539</td><td>|||||||||||||||||||||||||||</td><td>0.4421</td><td>||||||||||||||</td></tr>
<tr><td>54 82</td><td>2</td><td>0.9013</td><td>0.8175</td><td>||||||||||||||||||||||||||</td><td>0.4183</td><td>||||||||||||||</td></tr>
<tr><td>72 104</td><td>2</td><td>0.8990</td><td>0.8134</td><td>|||||||||||||||||||||||||</td><td>0.3894</td><td>|||||||||||||</td></tr>
<tr><td>110 152</td><td>2</td><td>0.8978</td><td>0.8113</td><td>|||||||||||||||||||||||||</td><td>0.3983</td><td>|||||||||||||</td></tr>
<tr><td>15 21</td><td>2</td><td>0.8809</td><td>0.7831</td><td>||||||||||||||||||||||||</td><td>0.3757</td><td>||||||||||||</td></tr>
<tr><td>69 101</td><td>2</td><td>0.8505</td><td>0.7346</td><td>|||||||||||||||||||||||</td><td>0.4725</td><td>|||||||||||||||</td></tr>
<tr><td>87 127</td><td>2</td><td>0.8402</td><td>0.7195</td><td>|||||||||||||||||||||||</td><td>0.3554</td><td>||||||||||||</td></tr>
<tr><td>97 138</td><td>2</td><td>0.8398</td><td>0.7182</td><td>|||||||||||||||||||||||</td><td>0.3679</td><td>||||||||||||</td></tr>
<tr><td>83 122</td><td>2</td><td>0.8355</td><td>0.7116</td><td>||||||||||||||||||||||</td><td>0.3572</td><td>||||||||||||</td></tr>
<tr><td>113 155</td><td>2</td><td>0.8231</td><td>0.6934</td><td>||||||||||||||||||||||</td><td>0.3882</td><td>|||||||||||||</td></tr>
<tr><td>96 136</td><td>2</td><td>0.8146</td><td>0.6811</td><td>|||||||||||||||||||||</td><td>0.4432</td><td>||||||||||||||</td></tr>
<tr><td>81 120</td><td>2</td><td>0.8084</td><td>0.6720</td><td>|||||||||||||||||||||</td><td>0.4472</td><td>||||||||||||||</td></tr>
<tr><td>47 71</td><td>2</td><td>0.8059</td><td>0.6689</td><td>|||||||||||||||||||||</td><td>0.3911</td><td>|||||||||||||</td></tr>
<tr><td>45 67</td><td>2</td><td>0.7947</td><td>0.6528</td><td>|||||||||||||||||||||</td><td>0.3370</td><td>|||||||||||</td></tr>
<tr><td>114 156</td><td>2</td><td>0.7691</td><td>0.6199</td><td>||||||||||||||||||||</td><td>0.3491</td><td>|||||||||||</td></tr>
<tr><td>85 125</td><td>2</td><td>0.7634</td><td>0.6111</td><td>|||||||||||||||||||</td><td>0.3182</td><td>|||||||||||</td></tr>
</table>

**Membership Summary Section for Clusters = 3**

<table>
<tr><th>Row</th><th>Cluster</th><th>Cluster Membership</th><th>Sum of Squared Memberships</th><th>Bar of Squared Memberships</th><th>Silhouette Amount</th><th>Silhouette Bar</th></tr>
<tr><td>31 43</td><td>2</td><td>0.7254</td><td>0.5647</td><td>|IIIIIIIIIIIIIIIII</td><td>0.3939</td><td>|IIIIIIIIIIII</td></tr>
<tr><td>120 165</td><td>2</td><td>0.6898</td><td>0.5240</td><td>|IIIIIIIIIIIIIIII</td><td>0.4007</td><td>|IIIIIIIIIIII</td></tr>
<tr><td>70 102</td><td>2</td><td>0.6669</td><td>0.5044</td><td>|IIIIIIIIIIIIIII</td><td>0.2729</td><td>|IIIIIIII</td></tr>
<tr><td>52 77</td><td>2</td><td>0.6584</td><td>0.4923</td><td>|IIIIIIIIIIIIIII</td><td>0.3613</td><td>|IIIIIIIIIII</td></tr>
<tr><td>88 128</td><td>2</td><td>0.6281</td><td>0.4638</td><td>|IIIIIIIIIIIIII</td><td>0.3573</td><td>|IIIIIIIIIII</td></tr>
<tr><td>60 89</td><td>2</td><td>0.6243</td><td>0.4648</td><td>|IIIIIIIIIIIIII</td><td>0.2576</td><td>|IIIIIIII</td></tr>
<tr><td>73 105</td><td>2</td><td>0.6157</td><td>0.4544</td><td>|IIIIIIIIIIIIII</td><td>0.3147</td><td>|IIIIIIIII</td></tr>
<tr><td>91 131</td><td>2</td><td>0.6100</td><td>0.4545</td><td>|IIIIIIIIIIIIII</td><td>0.3009</td><td>|IIIIIIIII</td></tr>
<tr><td>23 35</td><td>2</td><td>0.5674</td><td>0.4211</td><td>|IIIIIIIIIIIII</td><td>0.2291</td><td>|IIIIIII</td></tr>
<tr><td>103 144</td><td>2</td><td>0.5014</td><td>0.3815</td><td>|IIIIIIIIIII</td><td>0.1650</td><td>|IIIII</td></tr>
<tr><td>63 92</td><td>2</td><td>0.4987</td><td>0.3765</td><td>|IIIIIIIIIII</td><td>0.2331</td><td>|IIIIIII</td></tr>
<tr><td>50 74</td><td>2</td><td>0.4084</td><td>0.3460</td><td>|IIIIIIIIII</td><td>0.0648</td><td>|II</td></tr>
<tr><td>115 158</td><td>3</td><td>0.9097</td><td>0.8329</td><td>|IIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.0282</td><td>|I</td></tr>
<tr><td>11 14</td><td>3</td><td>0.9010</td><td>0.8178</td><td>|IIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.1010</td><td>|III</td></tr>
<tr><td>1 1</td><td>3</td><td>0.8917</td><td>0.8032</td><td>|IIIIIIIIIIIIIIIIIIIIIIII</td><td>0.0063</td><td>|</td></tr>
<tr><td>6 7</td><td>3</td><td>0.8765</td><td>0.7785</td><td>|IIIIIIIIIIIIIIIIIIIIIII</td><td>-0.0573</td><td>|</td></tr>
<tr><td>2 2</td><td>3</td><td>0.8726</td><td>0.7730</td><td>|IIIIIIIIIIIIIIIIIIIIIII</td><td>-0.0975</td><td>|</td></tr>
<tr><td>29 41</td><td>3</td><td>0.8416</td><td>0.7257</td><td>|IIIIIIIIIIIIIIIIIIIIII</td><td>-0.1672</td><td>|</td></tr>
<tr><td>102 143</td><td>3</td><td>0.8345</td><td>0.7121</td><td>|IIIIIIIIIIIIIIIIIIIII</td><td>0.2155</td><td>|IIIIII</td></tr>
<tr><td>46 68</td><td>3</td><td>0.8284</td><td>0.7088</td><td>|IIIIIIIIIIIIIIIIIIIII</td><td>-0.2318</td><td>|</td></tr>
<tr><td>100 141</td><td>3</td><td>0.8239</td><td>0.6962</td><td>|IIIIIIIIIIIIIIIIIIIII</td><td>0.2409</td><td>|IIIIIII</td></tr>
<tr><td>33 47</td><td>3</td><td>0.8202</td><td>0.6937</td><td>|IIIIIIIIIIIIIIIIIIIII</td><td>0.0087</td><td>|</td></tr>
<tr><td>8 11</td><td>3</td><td>0.8170</td><td>0.6856</td><td>|IIIIIIIIIIIIIIIIIIIII</td><td>0.2650</td><td>|IIIIIIII</td></tr>
<tr><td>78 115</td><td>3</td><td>0.7990</td><td>0.6665</td><td>|IIIIIIIIIIIIIIIIIIII</td><td>-0.2208</td><td>|</td></tr>
<tr><td>62 91</td><td>3</td><td>0.7841</td><td>0.6397</td><td>|IIIIIIIIIIIIIIIIIII</td><td>0.2581</td><td>|IIIIIIII</td></tr>
<tr><td>19 29</td><td>3</td><td>0.7831</td><td>0.6431</td><td>|IIIIIIIIIIIIIIIIIII</td><td>-0.0839</td><td>|</td></tr>
<tr><td>10 13</td><td>3</td><td>0.7701</td><td>0.6250</td><td>|IIIIIIIIIIIIIIIIIII</td><td>0.0181</td><td>|I</td></tr>
<tr><td>48 72</td><td>3</td><td>0.7572</td><td>0.6062</td><td>|IIIIIIIIIIIIIIIIII</td><td>0.1449</td><td>|IIII</td></tr>
<tr><td>74 107</td><td>3</td><td>0.7494</td><td>0.6086</td><td>|IIIIIIIIIIIIIIIIII</td><td>-0.2925</td><td>|</td></tr>
<tr><td>64 93</td><td>3</td><td>0.7490</td><td>0.6029</td><td>|IIIIIIIIIIIIIIIIII</td><td>-0.1308</td><td>|</td></tr>
<tr><td>104 146</td><td>3</td><td>0.7484</td><td>0.5937</td><td>|IIIIIIIIIIIIIIIIII</td><td>0.1398</td><td>|IIII</td></tr>
<tr><td>68 99</td><td>3</td><td>0.7312</td><td>0.5934</td><td>|IIIIIIIIIIIIIIIIII</td><td>-0.3190</td><td>|</td></tr>
<tr><td>117 161</td><td>3</td><td>0.7294</td><td>0.5697</td><td>|IIIIIIIIIIIIIIIII</td><td>0.2837</td><td>|IIIIIIIII</td></tr>
<tr><td>59 87</td><td>3</td><td>0.7136</td><td>0.5614</td><td>|IIIIIIIIIIIIIIIII</td><td>-0.0990</td><td>|</td></tr>
<tr><td>38 56</td><td>3</td><td>0.7108</td><td>0.5513</td><td>|IIIIIIIIIIIIIIIII</td><td>0.1088</td><td>|III</td></tr>
<tr><td>123 172</td><td>3</td><td>0.6989</td><td>0.5537</td><td>|IIIIIIIIIIIIIIIII</td><td>-0.2965</td><td>|</td></tr>
<tr><td>90 130</td><td>3</td><td>0.6967</td><td>0.5322</td><td>|IIIIIIIIIIIIIIII</td><td>0.2759</td><td>|IIIIIIII</td></tr>
<tr><td>34 49</td><td>3</td><td>0.6522</td><td>0.5228</td><td>|IIIIIIIIIIIIIIII</td><td>-0.3712</td><td>|</td></tr>
<tr><td>119 164</td><td>3</td><td>0.5682</td><td>0.4839</td><td>|IIIIIIIIIIIIIII</td><td>-0.4436</td><td>|</td></tr>
<tr><td>41 61</td><td>3</td><td>0.5672</td><td>0.4160</td><td>|IIIIIIIIIIII</td><td>0.2455</td><td>|IIIIIII</td></tr>
<tr><td>7 10</td><td>3</td><td>0.5442</td><td>0.4621</td><td>|IIIIIIIIIIIIII</td><td>-0.4227</td><td>|</td></tr>
<tr><td>24 36</td><td>3</td><td>0.5233</td><td>0.3879</td><td>|IIIIIIIIIIII</td><td>0.0627</td><td>|II</td></tr>
</table>

**Membership Summary Section for Clusters = 3**

<table>
<tr><th>Row</th><th>Cluster</th><th>Cluster Membership</th><th>Sum of Squared Memberships</th><th>Bar of Squared Memberships</th><th>Silhouette Amount</th><th>Silhouette Bar</th></tr>
<tr><td>101 142</td><td>3</td><td>0.4995</td><td>0.3757</td><td>|IIIIIIIIIII</td><td>0.1497</td><td>|IIII</td></tr>
<tr><td>42 63</td><td>3</td><td>0.4712</td><td>0.3619</td><td>|IIIIIIIIIII</td><td>0.1157</td><td>|III</td></tr>
<tr><td>94 134</td><td>3</td><td>0.3886</td><td>0.3396</td><td>|IIIIIIIIII</td><td>0.0407</td><td>|I</td></tr>
<tr><td>18 27</td><td>3</td><td>0.3641</td><td>0.3352</td><td>|IIIIIIIIII</td><td>0.0564</td><td>|II</td></tr>
</table>

**Membership Matrix Section**

| Row | Cluster | Prob in 1 | Prob in 2 | Prob in 3 |
|---|---|---|---|---|
| 1 1 | 3 | 0.0873 | 0.0210 | 0.8917 |
| 2 2 | 3 | 0.1051 | 0.0223 | 0.8726 |
| 3 3 | 1 | 0.8640 | 0.0540 | 0.0820 |
| 4 4 | 1 | 0.7640 | 0.0348 | 0.2012 |
| 5 6 | 2 | 0.0268 | 0.9505 | 0.0227 |
| 6 7 | 3 | 0.0979 | 0.0255 | 0.8765 |
| 7 10 | 3 | 0.4041 | 0.0517 | 0.5442 |
| 8 11 | 3 | 0.1176 | 0.0654 | 0.8170 |
| 9 12 | 1 | 0.9144 | 0.0148 | 0.0708 |
| 10 13 | 3 | 0.1672 | 0.0627 | 0.7701 |
| 11 14 | 3 | 0.0735 | 0.0255 | 0.9010 |
| 12 15 | 1 | 0.5318 | 0.0531 | 0.4151 |
| 13 19 | 2 | 0.0397 | 0.9331 | 0.0272 |
| 14 20 | 1 | 0.8992 | 0.0234 | 0.0775 |
| 15 21 | 2 | 0.0637 | 0.8809 | 0.0555 |
| 16 22 | 1 | 0.8867 | 0.0280 | 0.0854 |
| 17 26 | 2 | 0.0245 | 0.9546 | 0.0209 |
| 18 27 | 3 | 0.3031 | 0.3327 | 0.3641 |
| 19 29 | 3 | 0.1647 | 0.0522 | 0.7831 |
| 20 31 | 2 | 0.0259 | 0.9532 | 0.0209 |
| 21 32 | 2 | 0.0350 | 0.9383 | 0.0267 |
| 22 34 | 1 | 0.9465 | 0.0113 | 0.0422 |
| 23 35 | 2 | 0.1635 | 0.5674 | 0.2692 |
| 24 36 | 3 | 0.2246 | 0.2521 | 0.5233 |
| 25 37 | 1 | 0.7397 | 0.0316 | 0.2288 |
| 26 38 | 1 | 0.9253 | 0.0232 | 0.0515 |
| 27 39 | 1 | 0.6347 | 0.0981 | 0.2672 |
| 28 40 | 1 | 0.4969 | 0.0684 | 0.4347 |
| 29 41 | 3 | 0.1287 | 0.0298 | 0.8416 |
| 30 42 | 1 | 0.5486 | 0.0474 | 0.4040 |
| 31 43 | 2 | 0.1573 | 0.7254 | 0.1173 |
| 32 46 | 1 | 0.8870 | 0.0373 | 0.0758 |
| 33 47 | 3 | 0.1392 | 0.0406 | 0.8202 |
| 34 49 | 3 | 0.3097 | 0.0381 | 0.6522 |
| 35 52 | 1 | 0.8712 | 0.0239 | 0.1048 |

**Membership Matrix Section**

| Row | Cluster | Prob in 1 | Prob in 2 | Prob in 3 |
|---|---|---|---|---|
| 36 54 | 1 | 0.8809 | 0.0356 | 0.0835 |
| 37 55 | 1 | 0.8875 | 0.0247 | 0.0878 |
| 38 56 | 3 | 0.1906 | 0.0986 | 0.7108 |
| 39 58 | 1 | 0.8936 | 0.0319 | 0.0745 |
| 40 60 | 1 | 0.8549 | 0.0489 | 0.0962 |
| 41 61 | 3 | 0.2341 | 0.1986 | 0.5672 |
| 42 63 | 3 | 0.2579 | 0.2709 | 0.4712 |
| 43 64 | 2 | 0.0177 | 0.9673 | 0.0150 |
| 44 65 | 1 | 0.7311 | 0.0776 | 0.1913 |
| 45 67 | 2 | 0.0966 | 0.7947 | 0.1086 |
| 46 68 | 3 | 0.1486 | 0.0230 | 0.8284 |
| 47 71 | 2 | 0.0798 | 0.8059 | 0.1143 |
| 48 72 | 3 | 0.1629 | 0.0800 | 0.7572 |
| 49 73 | 1 | 0.8798 | 0.0339 | 0.0863 |
| 50 74 | 2 | 0.3416 | 0.4084 | 0.2501 |
| 51 75 | 1 | 0.6384 | 0.0316 | 0.3300 |
| 52 77 | 2 | 0.1554 | 0.6584 | 0.1863 |
| 53 80 | 1 | 0.5220 | 0.0703 | 0.4077 |
| 54 82 | 2 | 0.0597 | 0.9013 | 0.0390 |
| 55 83 | 1 | 0.9478 | 0.0123 | 0.0399 |
| 56 84 | 1 | 0.5074 | 0.2593 | 0.2334 |
| 57 85 | 2 | 0.0284 | 0.9418 | 0.0297 |
| 58 86 | 1 | 0.7589 | 0.1199 | 0.1212 |
| 59 87 | 3 | 0.2178 | 0.0686 | 0.7136 |
| 60 89 | 2 | 0.2356 | 0.6243 | 0.1401 |
| 61 90 | 2 | 0.0280 | 0.9483 | 0.0237 |
| 62 91 | 3 | 0.1362 | 0.0797 | 0.7841 |
| 63 92 | 2 | 0.2176 | 0.4987 | 0.2837 |
| 64 93 | 3 | 0.1974 | 0.0536 | 0.7490 |
| 65 95 | 1 | 0.8651 | 0.0278 | 0.1071 |
| 66 97 | 1 | 0.7254 | 0.1447 | 0.1299 |
| 67 98 | 1 | 0.9393 | 0.0174 | 0.0434 |
| 68 99 | 3 | 0.2406 | 0.0281 | 0.7312 |
| 69 101 | 2 | 0.0661 | 0.8505 | 0.0834 |
| 70 102 | 2 | 0.2121 | 0.6669 | 0.1211 |
| 71 103 | 1 | 0.9320 | 0.0143 | 0.0537 |
| 72 104 | 2 | 0.0564 | 0.8990 | 0.0446 |
| 73 105 | 2 | 0.2187 | 0.6157 | 0.1656 |
| 74 107 | 3 | 0.2136 | 0.0371 | 0.7494 |
| 75 110 | 2 | 0.0367 | 0.9271 | 0.0362 |
| 76 113 | 1 | 0.7443 | 0.0302 | 0.2255 |
| 77 114 | 1 | 0.7849 | 0.0878 | 0.1273 |
| 78 115 | 3 | 0.1634 | 0.0376 | 0.7990 |
| 79 117 | 1 | 0.5249 | 0.0373 | 0.4378 |

**Membership Matrix Section**

| Row | Cluster | Prob in 1 | Prob in 2 | Prob in 3 |
|---|---|---|---|---|
| 80 118 | 2 | 0.0310 | 0.9458 | 0.0232 |
| 81 120 | 2 | 0.1035 | 0.8084 | 0.0881 |
| 82 121 | 2 | 0.0214 | 0.9577 | 0.0209 |
| 83 122 | 2 | 0.0800 | 0.8355 | 0.0845 |
| 84 124 | 1 | 0.5368 | 0.2517 | 0.2116 |
| 85 125 | 2 | 0.1070 | 0.7634 | 0.1296 |
| 86 126 | 1 | 0.9061 | 0.0289 | 0.0650 |
| 87 127 | 2 | 0.1002 | 0.8402 | 0.0597 |
| 88 128 | 2 | 0.1938 | 0.6281 | 0.1781 |
| 89 129 | 1 | 0.7612 | 0.1049 | 0.1340 |
| 90 130 | 3 | 0.1723 | 0.1310 | 0.6967 |
| 91 131 | 2 | 0.1385 | 0.6100 | 0.2514 |
| 92 132 | 1 | 0.4875 | 0.0599 | 0.4526 |
| 93 133 | 2 | 0.0256 | 0.9544 | 0.0200 |
| 94 134 | 3 | 0.2768 | 0.3346 | 0.3886 |
| 95 135 | 1 | 0.9047 | 0.0159 | 0.0794 |
| 96 136 | 2 | 0.0791 | 0.8146 | 0.1063 |
| 97 138 | 2 | 0.0709 | 0.8398 | 0.0893 |
| 98 139 | 1 | 0.6949 | 0.0522 | 0.2530 |
| 99 140 | 1 | 0.9442 | 0.0113 | 0.0445 |
| 100 141 | 3 | 0.1183 | 0.0578 | 0.8239 |
| 101 142 | 3 | 0.2289 | 0.2716 | 0.4995 |
| 102 143 | 3 | 0.1140 | 0.0514 | 0.8345 |
| 103 144 | 2 | 0.3030 | 0.5014 | 0.1956 |
| 104 146 | 3 | 0.1576 | 0.0941 | 0.7484 |
| 105 147 | 1 | 0.9059 | 0.0266 | 0.0675 |
| 106 148 | 2 | 0.0191 | 0.9647 | 0.0162 |
| 107 149 | 1 | 0.9437 | 0.0126 | 0.0437 |
| 108 150 | 1 | 0.8172 | 0.0471 | 0.1357 |
| 109 151 | 1 | 0.8611 | 0.0270 | 0.1119 |
| 110 152 | 2 | 0.0529 | 0.8978 | 0.0493 |
| 111 153 | 2 | 0.0336 | 0.9347 | 0.0318 |
| 112 154 | 2 | 0.0329 | 0.9368 | 0.0303 |
| 113 155 | 2 | 0.0758 | 0.8231 | 0.1012 |
| 114 156 | 2 | 0.1441 | 0.7691 | 0.0867 |
| 115 158 | 3 | 0.0710 | 0.0193 | 0.9097 |
| 116 159 | 2 | 0.0460 | 0.9224 | 0.0316 |
| 117 161 | 3 | 0.1589 | 0.1118 | 0.7294 |
| 118 163 | 1 | 0.7449 | 0.0938 | 0.1613 |
| 119 164 | 3 | 0.4000 | 0.0318 | 0.5682 |
| 120 165 | 2 | 0.1605 | 0.6898 | 0.1497 |
| 121 168 | 1 | 0.8210 | 0.0649 | 0.1141 |
| 122 171 | 1 | 0.9064 | 0.0347 | 0.0590 |
| 123 172 | 3 | 0.2502 | 0.0509 | 0.6989 |

**Cluster Medoids Section**

| Variable | Cluster1 | Cluster2 | Cluster3 | Cluster4 |
|---|---|---|---|---|
| Factor1 | 0.6211 | 0.0502 | -0.882 | 1.0082 |
| Factor2 | -0.9814 | -0.5027 | 0.9945 | 2.2898 |
| Factor3 | -0.8059 | 0.6975 | -0.6271 | 0.3485 |
| Row | 115 158 | 22 34 | 5 6 | 31 43 |

**Membership Summary Section for Clusters = 4**

<table>
<tr><th>Row</th><th>Cluster</th><th>Cluster Membership</th><th>Sum of Squared Memberships</th><th>Bar of Squared Memberships</th><th>Silhouette Amount</th><th>Silhouette Bar</th></tr>
<tr><td>115 158</td><td>1</td><td>0.9214</td><td>0.8522</td><td>|||||||||||||||||||||||||||</td><td>0.3886</td><td>|||||||||||||</td></tr>
<tr><td>11 14</td><td>1</td><td>0.9102</td><td>0.8321</td><td>||||||||||||||||||||||||||</td><td>0.4305</td><td>||||||||||||||</td></tr>
<tr><td>1 1</td><td>1</td><td>0.9095</td><td>0.8315</td><td>||||||||||||||||||||||||||</td><td>0.3757</td><td>||||||||||||</td></tr>
<tr><td>6 7</td><td>1</td><td>0.9042</td><td>0.8224</td><td>||||||||||||||||||||||||||</td><td>0.3530</td><td>||||||||||||</td></tr>
<tr><td>2 2</td><td>1</td><td>0.8824</td><td>0.7863</td><td>|||||||||||||||||||||||||</td><td>0.2856</td><td>||||||||||</td></tr>
<tr><td>46 68</td><td>1</td><td>0.8614</td><td>0.7543</td><td>||||||||||||||||||||||||</td><td>0.1899</td><td>|||||||</td></tr>
<tr><td>29 41</td><td>1</td><td>0.8483</td><td>0.7321</td><td>|||||||||||||||||||||||</td><td>0.2222</td><td>||||||||</td></tr>
<tr><td>33 47</td><td>1</td><td>0.8417</td><td>0.7209</td><td>|||||||||||||||||||||||</td><td>0.3681</td><td>||||||||||||</td></tr>
<tr><td>78 115</td><td>1</td><td>0.8263</td><td>0.6996</td><td>||||||||||||||||||||||</td><td>0.1998</td><td>|||||||</td></tr>
<tr><td>102 143</td><td>1</td><td>0.8189</td><td>0.6839</td><td>||||||||||||||||||||||</td><td>0.4504</td><td>|||||||||||||||</td></tr>
<tr><td>74 107</td><td>1</td><td>0.7927</td><td>0.6552</td><td>|||||||||||||||||||||</td><td>0.1331</td><td>|||||</td></tr>
<tr><td>10 13</td><td>1</td><td>0.7804</td><td>0.6305</td><td>||||||||||||||||||||</td><td>0.3524</td><td>||||||||||||</td></tr>
<tr><td>68 99</td><td>1</td><td>0.7799</td><td>0.6424</td><td>||||||||||||||||||||</td><td>0.0889</td><td>||||</td></tr>
<tr><td>64 93</td><td>1</td><td>0.7772</td><td>0.6297</td><td>||||||||||||||||||||</td><td>0.2731</td><td>|||||||||</td></tr>
<tr><td>100 141</td><td>1</td><td>0.7669</td><td>0.6088</td><td>|||||||||||||||||||</td><td>0.4207</td><td>||||||||||||||</td></tr>
<tr><td>8 11</td><td>1</td><td>0.7483</td><td>0.5829</td><td>||||||||||||||||||</td><td>0.4314</td><td>||||||||||||||</td></tr>
<tr><td>48 72</td><td>1</td><td>0.7408</td><td>0.5755</td><td>||||||||||||||||||</td><td>0.3939</td><td>|||||||||||||</td></tr>
<tr><td>19 29</td><td>1</td><td>0.7348</td><td>0.5720</td><td>||||||||||||||||||</td><td>0.2091</td><td>|||||||</td></tr>
<tr><td>59 87</td><td>1</td><td>0.7298</td><td>0.5679</td><td>||||||||||||||||||</td><td>0.2720</td><td>|||||||||</td></tr>
<tr><td>62 91</td><td>1</td><td>0.6988</td><td>0.5207</td><td>|||||||||||||||||</td><td>0.4036</td><td>|||||||||||||</td></tr>
<tr><td>38 56</td><td>1</td><td>0.6888</td><td>0.5124</td><td>||||||||||||||||</td><td>0.3564</td><td>||||||||||||</td></tr>
<tr><td>123 172</td><td>1</td><td>0.6812</td><td>0.5222</td><td>|||||||||||||||||</td><td>0.0149</td><td>|</td></tr>
<tr><td>34 49</td><td>1</td><td>0.6596</td><td>0.5144</td><td>||||||||||||||||</td><td>-0.0715</td><td>|</td></tr>
<tr><td>117 161</td><td>1</td><td>0.6548</td><td>0.4703</td><td>|||||||||||||||</td><td>0.4162</td><td>|||||||||||||</td></tr>
<tr><td>104 146</td><td>1</td><td>0.6488</td><td>0.4647</td><td>|||||||||||||||</td><td>0.3114</td><td>||||||||||</td></tr>
<tr><td>119 164</td><td>1</td><td>0.6143</td><td>0.4939</td><td>||||||||||||||||</td><td>-0.1190</td><td>|</td></tr>
<tr><td>7 10</td><td>1</td><td>0.5918</td><td>0.4658</td><td>|||||||||||||||</td><td>-0.0710</td><td>|</td></tr>
<tr><td>90 130</td><td>1</td><td>0.5785</td><td>0.3947</td><td>|||||||||||||</td><td>0.3691</td><td>||||||||||||</td></tr>
<tr><td>92 132</td><td>1</td><td>0.4812</td><td>0.4214</td><td>||||||||||||||</td><td>-0.1529</td><td>|</td></tr>
<tr><td>79 117</td><td>1</td><td>0.4774</td><td>0.4483</td><td>||||||||||||||</td><td>-0.2283</td><td>|</td></tr>
<tr><td>28 40</td><td>1</td><td>0.4575</td><td>0.4091</td><td>|||||||||||||</td><td>-0.1610</td><td>|</td></tr>
<tr><td>41 61</td><td>1</td><td>0.4333</td><td>0.2956</td><td>||||||||||</td><td>0.2774</td><td>|||||||||</td></tr>
<tr><td>24 36</td><td>1</td><td>0.3550</td><td>0.2695</td><td>|||||||||</td><td>0.1367</td><td>|||||</td></tr>
<tr><td>101 142</td><td>1</td><td>0.3242</td><td>0.2684</td><td>|||||||||</td><td>0.1478</td><td>|||||</td></tr>
<tr><td>22 34</td><td>2</td><td>0.9508</td><td>0.9053</td><td>||||||||||||||||||||||||||||</td><td>0.6258</td><td>||||||||||||||||||||</td></tr>
</table>

**Membership Summary Section for Clusters = 4**

<table>
<tr><th>Row</th><th>Cluster</th><th>Cluster Membership</th><th>Sum of Squared Memberships</th><th>Bar of Squared Memberships</th><th>Silhouette Amount</th><th>Silhouette Bar</th></tr>
<tr><td>55 83</td><td>2</td><td>0.9490</td><td>0.9019</td><td>|IIIIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.6401</td><td>|IIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>99 140</td><td>2</td><td>0.9487</td><td>0.9015</td><td>|IIIIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.6196</td><td>|IIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>107 149</td><td>2</td><td>0.9479</td><td>0.8998</td><td>|IIIIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.6259</td><td>|IIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>67 98</td><td>2</td><td>0.9386</td><td>0.8827</td><td>|IIIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.6552</td><td>|IIIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>71 103</td><td>2</td><td>0.9324</td><td>0.8718</td><td>|IIIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.6044</td><td>|IIIIIIIIIIIIIIIIII</td></tr>
<tr><td>9 12</td><td>2</td><td>0.9159</td><td>0.8431</td><td>|IIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.5665</td><td>|IIIIIIIIIIIIIIIII</td></tr>
<tr><td>26 38</td><td>2</td><td>0.9150</td><td>0.8401</td><td>|IIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.6525</td><td>|IIIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>95 135</td><td>2</td><td>0.9055</td><td>0.8253</td><td>|IIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.5542</td><td>|IIIIIIIIIIIIIIIII</td></tr>
<tr><td>86 126</td><td>2</td><td>0.8994</td><td>0.8131</td><td>|IIIIIIIIIIIIIIIIIIIIIIII</td><td>0.6291</td><td>|IIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>105 147</td><td>2</td><td>0.8993</td><td>0.8133</td><td>|IIIIIIIIIIIIIIIIIIIIIIII</td><td>0.5927</td><td>|IIIIIIIIIIIIIIIIII</td></tr>
<tr><td>14 20</td><td>2</td><td>0.8909</td><td>0.7994</td><td>|IIIIIIIIIIIIIIIIIIIIIIII</td><td>0.6082</td><td>|IIIIIIIIIIIIIIIIII</td></tr>
<tr><td>122 171</td><td>2</td><td>0.8869</td><td>0.7913</td><td>|IIIIIIIIIIIIIIIIIIIIIIII</td><td>0.6510</td><td>|IIIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>39 58</td><td>2</td><td>0.8850</td><td>0.7889</td><td>|IIIIIIIIIIIIIIIIIIIIIIII</td><td>0.6173</td><td>|IIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>37 55</td><td>2</td><td>0.8836</td><td>0.7880</td><td>|IIIIIIIIIIIIIIIIIIIIIIII</td><td>0.5552</td><td>|IIIIIIIIIIIIIIIII</td></tr>
<tr><td>32 46</td><td>2</td><td>0.8722</td><td>0.7672</td><td>|IIIIIIIIIIIIIIIIIIIIIII</td><td>0.6269</td><td>|IIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>16 22</td><td>2</td><td>0.8717</td><td>0.7674</td><td>|IIIIIIIIIIIIIIIIIIIIIII</td><td>0.5976</td><td>|IIIIIIIIIIIIIIIIII</td></tr>
<tr><td>49 73</td><td>2</td><td>0.8714</td><td>0.7667</td><td>|IIIIIIIIIIIIIIIIIIIIIII</td><td>0.5891</td><td>|IIIIIIIIIIIIIIIIII</td></tr>
<tr><td>36 54</td><td>2</td><td>0.8702</td><td>0.7644</td><td>|IIIIIIIIIIIIIIIIIIIIIII</td><td>0.6047</td><td>|IIIIIIIIIIIIIIIIII</td></tr>
<tr><td>35 52</td><td>2</td><td>0.8616</td><td>0.7528</td><td>|IIIIIIIIIIIIIIIIIIIIIII</td><td>0.5544</td><td>|IIIIIIIIIIIIIIIII</td></tr>
<tr><td>65 95</td><td>2</td><td>0.8596</td><td>0.7496</td><td>|IIIIIIIIIIIIIIIIIIIIII</td><td>0.5379</td><td>|IIIIIIIIIIIIIIII</td></tr>
<tr><td>109 151</td><td>2</td><td>0.8558</td><td>0.7442</td><td>|IIIIIIIIIIIIIIIIIIIIII</td><td>0.5204</td><td>|IIIIIIIIIIIIIIII</td></tr>
<tr><td>3 3</td><td>2</td><td>0.8260</td><td>0.6929</td><td>|IIIIIIIIIIIIIIIIIIIII</td><td>0.6227</td><td>|IIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>40 60</td><td>2</td><td>0.8191</td><td>0.6831</td><td>|IIIIIIIIIIIIIIIIIIII</td><td>0.6046</td><td>|IIIIIIIIIIIIIIIIII</td></tr>
<tr><td>108 150</td><td>2</td><td>0.8005</td><td>0.6598</td><td>|IIIIIIIIIIIIIIIIIIII</td><td>0.5169</td><td>|IIIIIIIIIIIIIIII</td></tr>
<tr><td>121 168</td><td>2</td><td>0.7714</td><td>0.6138</td><td>|IIIIIIIIIIIIIIIIII</td><td>0.5891</td><td>|IIIIIIIIIIIIIIIIII</td></tr>
<tr><td>4 4</td><td>2</td><td>0.7391</td><td>0.5912</td><td>|IIIIIIIIIIIIIIIIII</td><td>0.4101</td><td>|IIIIIIIIIIII</td></tr>
<tr><td>77 114</td><td>2</td><td>0.7364</td><td>0.5666</td><td>|IIIIIIIIIIIIIIIII</td><td>0.5666</td><td>|IIIIIIIIIIIIIIIII</td></tr>
<tr><td>25 37</td><td>2</td><td>0.7210</td><td>0.5719</td><td>|IIIIIIIIIIIIIIIII</td><td>0.4259</td><td>|IIIIIIIIIIIII</td></tr>
<tr><td>76 113</td><td>2</td><td>0.7196</td><td>0.5739</td><td>|IIIIIIIIIIIIIIIII</td><td>0.3886</td><td>|IIIIIIIIIIII</td></tr>
<tr><td>89 129</td><td>2</td><td>0.6887</td><td>0.5071</td><td>|IIIIIIIIIIIIIII</td><td>0.5663</td><td>|IIIIIIIIIIIIIIIII</td></tr>
<tr><td>44 65</td><td>2</td><td>0.6840</td><td>0.5088</td><td>|IIIIIIIIIIIIIII</td><td>0.4811</td><td>|IIIIIIIIIIIIII</td></tr>
<tr><td>58 86</td><td>2</td><td>0.6820</td><td>0.4989</td><td>|IIIIIIIIIIIIIII</td><td>0.5079</td><td>|IIIIIIIIIIIIIII</td></tr>
<tr><td>118 163</td><td>2</td><td>0.6765</td><td>0.4946</td><td>|IIIIIIIIIIIIIII</td><td>0.5250</td><td>|IIIIIIIIIIIIIIII</td></tr>
<tr><td>98 139</td><td>2</td><td>0.6623</td><td>0.5090</td><td>|IIIIIIIIIIIIIII</td><td>0.3546</td><td>|IIIIIIIIIII</td></tr>
<tr><td>66 97</td><td>2</td><td>0.6439</td><td>0.4569</td><td>|IIIIIIIIIIIIII</td><td>0.4590</td><td>|IIIIIIIIIIIIII</td></tr>
<tr><td>51 75</td><td>2</td><td>0.6095</td><td>0.4875</td><td>|IIIIIIIIIIIIIII</td><td>0.3260</td><td>|IIIIIIIIII</td></tr>
<tr><td>27 39</td><td>2</td><td>0.5803</td><td>0.4096</td><td>|IIIIIIIIIIII</td><td>0.4037</td><td>|IIIIIIIIIIII</td></tr>
<tr><td>12 15</td><td>2</td><td>0.5026</td><td>0.4217</td><td>|IIIIIIIIIIIII</td><td>0.2682</td><td>|IIIIIIII</td></tr>
<tr><td>53 80</td><td>2</td><td>0.4940</td><td>0.3951</td><td>|IIIIIIIIIIII</td><td>0.2720</td><td>|IIIIIIII</td></tr>
<tr><td>30 42</td><td>2</td><td>0.4913</td><td>0.4365</td><td>|IIIIIIIIIIIII</td><td>0.1910</td><td>|IIIIII</td></tr>
<tr><td>84 124</td><td>2</td><td>0.4078</td><td>0.2887</td><td>|IIIIIIIII</td><td>0.3381</td><td>|IIIIIIIIII</td></tr>
<tr><td>56 84</td><td>2</td><td>0.3587</td><td>0.2824</td><td>|IIIIIIII</td><td>0.3100</td><td>|IIIIIIIII</td></tr>
</table>

**Membership Summary Section for Clusters = 4**

<table>
<tr><th>Row</th><th>Cluster</th><th>Cluster Membership</th><th>Sum of Squared Memberships</th><th>Bar of Squared Memberships</th><th>Silhouette Amount</th><th>Silhouette Bar</th></tr>
<tr><td>5 6</td><td>3</td><td>0.9596</td><td>0.9215</td><td>|IIIIIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.7239</td><td>|IIIIIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>61 90</td><td>3</td><td>0.9572</td><td>0.9169</td><td>|IIIIIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.7237</td><td>|IIIIIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>17 26</td><td>3</td><td>0.9569</td><td>0.9163</td><td>|IIIIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.7186</td><td>|IIIIIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>20 31</td><td>3</td><td>0.9529</td><td>0.9088</td><td>|IIIIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.7108</td><td>|IIIIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>111 153</td><td>3</td><td>0.9497</td><td>0.9029</td><td>|IIIIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.7294</td><td>|IIIIIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>43 64</td><td>3</td><td>0.9365</td><td>0.8791</td><td>|IIIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.7266</td><td>|IIIIIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>82 121</td><td>3</td><td>0.9291</td><td>0.8655</td><td>|IIIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.7323</td><td>|IIIIIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>110 152</td><td>3</td><td>0.9238</td><td>0.8553</td><td>|IIIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.6910</td><td>|IIIIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>93 133</td><td>3</td><td>0.9190</td><td>0.8476</td><td>|IIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.7072</td><td>|IIIIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>106 148</td><td>3</td><td>0.9106</td><td>0.8332</td><td>|IIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.7175</td><td>|IIIIIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>72 104</td><td>3</td><td>0.9030</td><td>0.8189</td><td>|IIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.6635</td><td>|IIIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>15 21</td><td>3</td><td>0.9010</td><td>0.8152</td><td>|IIIIIIIIIIIIIIIIIIIIIIII</td><td>0.6655</td><td>|IIIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>57 85</td><td>3</td><td>0.8779</td><td>0.7780</td><td>|IIIIIIIIIIIIIIIIIIIIIII</td><td>0.7131</td><td>|IIIIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>83 122</td><td>3</td><td>0.8680</td><td>0.7593</td><td>|IIIIIIIIIIIIIIIIIIIIIII</td><td>0.6550</td><td>|IIIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>97 138</td><td>3</td><td>0.8518</td><td>0.7331</td><td>|IIIIIIIIIIIIIIIIIIIIII</td><td>0.6520</td><td>|IIIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>13 19</td><td>3</td><td>0.8393</td><td>0.7167</td><td>|IIIIIIIIIIIIIIIIIIIII</td><td>0.6277</td><td>|IIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>113 155</td><td>3</td><td>0.8306</td><td>0.6999</td><td>|IIIIIIIIIIIIIIIIIIIII</td><td>0.6580</td><td>|IIIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>116 159</td><td>3</td><td>0.8258</td><td>0.6960</td><td>|IIIIIIIIIIIIIIIIIIIII</td><td>0.6344</td><td>|IIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>45 67</td><td>3</td><td>0.8247</td><td>0.6904</td><td>|IIIIIIIIIIIIIIIIIIIII</td><td>0.6312</td><td>|IIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>75 110</td><td>3</td><td>0.8112</td><td>0.6760</td><td>|IIIIIIIIIIIIIIIIIIII</td><td>0.6587</td><td>|IIIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>80 118</td><td>3</td><td>0.8057</td><td>0.6705</td><td>|IIIIIIIIIIIIIIIIIIII</td><td>0.6546</td><td>|IIIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>85 125</td><td>3</td><td>0.7950</td><td>0.6461</td><td>|IIIIIIIIIIIIIIIIIII</td><td>0.6137</td><td>|IIIIIIIIIIIIIIIIII</td></tr>
<tr><td>21 32</td><td>3</td><td>0.7905</td><td>0.6491</td><td>|IIIIIIIIIIIIIIIIIII</td><td>0.6314</td><td>|IIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>47 71</td><td>3</td><td>0.7724</td><td>0.6152</td><td>|IIIIIIIIIIIIIIIIII</td><td>0.6268</td><td>|IIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>54 82</td><td>3</td><td>0.7668</td><td>0.6137</td><td>|IIIIIIIIIIIIIIIIII</td><td>0.5942</td><td>|IIIIIIIIIIIIIIIIII</td></tr>
<tr><td>96 136</td><td>3</td><td>0.7449</td><td>0.5799</td><td>|IIIIIIIIIIIIIIIII</td><td>0.6392</td><td>|IIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>112 154</td><td>3</td><td>0.7414</td><td>0.5908</td><td>|IIIIIIIIIIIIIIIIII</td><td>0.6653</td><td>|IIIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>69 101</td><td>3</td><td>0.6798</td><td>0.5119</td><td>|IIIIIIIIIIIIIII</td><td>0.6319</td><td>|IIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>87 127</td><td>3</td><td>0.6305</td><td>0.4627</td><td>|IIIIIIIIIIIIII</td><td>0.4997</td><td>|IIIIIIIIIIIIIII</td></tr>
<tr><td>23 35</td><td>3</td><td>0.5676</td><td>0.3877</td><td>|IIIIIIIIIIII</td><td>0.4318</td><td>|IIIIIIIIIIIII</td></tr>
<tr><td>91 131</td><td>3</td><td>0.4872</td><td>0.3346</td><td>|IIIIIIIIII</td><td>0.4013</td><td>|IIIIIIIIIIII</td></tr>
<tr><td>31 43</td><td>4</td><td>0.8344</td><td>0.7092</td><td>|IIIIIIIIIIIIIIIIIIIII</td><td>-0.2875</td><td>|</td></tr>
<tr><td>120 165</td><td>4</td><td>0.8274</td><td>0.6980</td><td>|IIIIIIIIIIIIIIIIIIIII</td><td>-0.2070</td><td>|</td></tr>
<tr><td>73 105</td><td>4</td><td>0.8167</td><td>0.6804</td><td>|IIIIIIIIIIIIIIIIIIII</td><td>-0.0779</td><td>|</td></tr>
<tr><td>88 128</td><td>4</td><td>0.8043</td><td>0.6625</td><td>|IIIIIIIIIIIIIIIIIIII</td><td>-0.0730</td><td>|</td></tr>
<tr><td>81 120</td><td>4</td><td>0.7620</td><td>0.6132</td><td>|IIIIIIIIIIIIIIIIII</td><td>-0.4699</td><td>|</td></tr>
<tr><td>60 89</td><td>4</td><td>0.6934</td><td>0.5195</td><td>|IIIIIIIIIIIIIIII</td><td>-0.2829</td><td>|</td></tr>
<tr><td>52 77</td><td>4</td><td>0.6569</td><td>0.4842</td><td>|IIIIIIIIIIIIIII</td><td>-0.3707</td><td>|</td></tr>
<tr><td>70 102</td><td>4</td><td>0.6254</td><td>0.4534</td><td>|IIIIIIIIIIIIII</td><td>-0.3998</td><td>|</td></tr>
<tr><td>114 156</td><td>4</td><td>0.6187</td><td>0.4605</td><td>|IIIIIIIIIIIIII</td><td>-0.5130</td><td>|</td></tr>
<tr><td>103 144</td><td>4</td><td>0.6057</td><td>0.4231</td><td>|IIIIIIIIIIIII</td><td>-0.0773</td><td>|</td></tr>
<tr><td>63 92</td><td>4</td><td>0.5750</td><td>0.3961</td><td>|IIIIIIIIIIII</td><td>-0.1098</td><td>|</td></tr>
</table>

**Membership Summary Section for Clusters = 4**

| Row | Cluster | Cluster Membership | Sum of Squared Memberships | Bar of Squared Memberships | Silhouette Amount | Silhouette Bar |
|---|---|---|---|---|---|---|
| 50 74 | 4 | 0.4227 | 0.2926 | \|IIIIIIIII | -0.0010 | \| |
| 94 134 | 4 | 0.4082 | 0.2846 | \|IIIIIIIII | -0.0512 | \| |
| 42 63 | 4 | 0.3444 | 0.2703 | \|IIIIIIII | -0.3282 | \| |
| 18 27 | 4 | 0.2939 | 0.2532 | \|IIIIIIII | -0.0010 | \| |

**Membership Matrix Section**

| Row | Cluster | Prob in 1 | Prob in 2 | Prob in 3 | Prob in 4 |
|---|---|---|---|---|---|
| 1 1 | 1 | 0.9095 | 0.0627 | 0.0161 | 0.0117 |
| 2 2 | 1 | 0.8824 | 0.0844 | 0.0190 | 0.0143 |
| 3 3 | 2 | 0.0766 | 0.8260 | 0.0485 | 0.0490 |
| 4 4 | 2 | 0.2084 | 0.7391 | 0.0321 | 0.0204 |
| 5 6 | 3 | 0.0089 | 0.0108 | 0.9596 | 0.0207 |
| 6 7 | 1 | 0.9042 | 0.0654 | 0.0188 | 0.0116 |
| 7 10 | 1 | 0.5918 | 0.3358 | 0.0458 | 0.0265 |
| 8 11 | 1 | 0.7483 | 0.1193 | 0.0695 | 0.0629 |
| 9 12 | 2 | 0.0632 | 0.9159 | 0.0123 | 0.0087 |
| 10 13 | 1 | 0.7804 | 0.1319 | 0.0546 | 0.0331 |
| 11 14 | 1 | 0.9102 | 0.0551 | 0.0210 | 0.0137 |
| 12 15 | 2 | 0.4060 | 0.5026 | 0.0517 | 0.0397 |
| 13 19 | 3 | 0.0234 | 0.0349 | 0.8393 | 0.1024 |
| 14 20 | 2 | 0.0698 | 0.8909 | 0.0200 | 0.0192 |
| 15 21 | 3 | 0.0266 | 0.0308 | 0.9010 | 0.0416 |
| 16 22 | 2 | 0.0791 | 0.8717 | 0.0251 | 0.0240 |
| 17 26 | 3 | 0.0092 | 0.0110 | 0.9569 | 0.0230 |
| 18 27 | 4 | 0.2541 | 0.2177 | 0.2343 | 0.2939 |
| 19 29 | 1 | 0.7348 | 0.1641 | 0.0544 | 0.0468 |
| 20 31 | 3 | 0.0097 | 0.0123 | 0.9529 | 0.0252 |
| 21 32 | 3 | 0.0256 | 0.0346 | 0.7905 | 0.1493 |
| 22 34 | 2 | 0.0342 | 0.9508 | 0.0086 | 0.0064 |
| 23 35 | 3 | 0.1895 | 0.1171 | 0.5676 | 0.1258 |
| 24 36 | 1 | 0.3550 | 0.1795 | 0.1944 | 0.2711 |
| 25 37 | 2 | 0.2249 | 0.7210 | 0.0292 | 0.0249 |
| 26 38 | 2 | 0.0465 | 0.9150 | 0.0201 | 0.0184 |
| 27 39 | 2 | 0.2371 | 0.5803 | 0.0886 | 0.0940 |
| 28 40 | 1 | 0.4575 | 0.4409 | 0.0629 | 0.0387 |
| 29 41 | 1 | 0.8483 | 0.1070 | 0.0269 | 0.0178 |
| 30 42 | 2 | 0.4387 | 0.4913 | 0.0434 | 0.0265 |
| 31 43 | 4 | 0.0250 | 0.0347 | 0.1060 | 0.8344 |
| 32 46 | 2 | 0.0681 | 0.8722 | 0.0318 | 0.0279 |
| 33 47 | 1 | 0.8417 | 0.1039 | 0.0328 | 0.0215 |
| 34 49 | 1 | 0.6596 | 0.2782 | 0.0356 | 0.0266 |
| 35 52 | 2 | 0.0983 | 0.8616 | 0.0217 | 0.0185 |

**Membership Matrix Section**

| Row | Cluster | Prob in 1 | Prob in 2 | Prob in 3 | Prob in 4 |
|---|---|---|---|---|---|
| 36 54 | 2 | 0.0750 | 0.8702 | 0.0304 | 0.0244 |
| 37 55 | 2 | 0.0809 | 0.8836 | 0.0215 | 0.0139 |
| 38 56 | 1 | 0.6888 | 0.1614 | 0.0920 | 0.0578 |
| 39 58 | 2 | 0.0662 | 0.8850 | 0.0270 | 0.0217 |
| 40 60 | 2 | 0.0894 | 0.8191 | 0.0437 | 0.0478 |
| 41 61 | 1 | 0.4333 | 0.1965 | 0.1666 | 0.2036 |
| 42 63 | 4 | 0.2932 | 0.1831 | 0.1792 | 0.3444 |
| 43 64 | 3 | 0.0101 | 0.0123 | 0.9365 | 0.0410 |
| 44 65 | 2 | 0.1768 | 0.6840 | 0.0724 | 0.0668 |
| 45 67 | 3 | 0.0589 | 0.0532 | 0.8247 | 0.0632 |
| 46 68 | 1 | 0.8614 | 0.1085 | 0.0178 | 0.0122 |
| 47 71 | 3 | 0.0715 | 0.0528 | 0.7724 | 0.1034 |
| 48 72 | 1 | 0.7408 | 0.1374 | 0.0741 | 0.0477 |
| 49 73 | 2 | 0.0781 | 0.8714 | 0.0291 | 0.0214 |
| 50 74 | 4 | 0.1494 | 0.2068 | 0.2211 | 0.4227 |
| 51 75 | 2 | 0.3384 | 0.6095 | 0.0291 | 0.0229 |
| 52 77 | 4 | 0.0703 | 0.0638 | 0.2089 | 0.6569 |
| 53 80 | 2 | 0.3779 | 0.4940 | 0.0674 | 0.0607 |
| 54 82 | 3 | 0.0333 | 0.0517 | 0.7668 | 0.1482 |
| 55 83 | 2 | 0.0334 | 0.9490 | 0.0099 | 0.0077 |
| 56 84 | 2 | 0.1595 | 0.3587 | 0.1627 | 0.3191 |
| 57 85 | 3 | 0.0213 | 0.0214 | 0.8779 | 0.0793 |
| 58 86 | 2 | 0.1094 | 0.6820 | 0.1036 | 0.1049 |
| 59 87 | 1 | 0.7298 | 0.1743 | 0.0600 | 0.0360 |
| 60 89 | 4 | 0.0509 | 0.0869 | 0.1688 | 0.6934 |
| 61 90 | 3 | 0.0095 | 0.0115 | 0.9572 | 0.0219 |
| 62 91 | 1 | 0.6988 | 0.1377 | 0.0833 | 0.0801 |
| 63 92 | 4 | 0.1227 | 0.1025 | 0.1997 | 0.5750 |
| 64 93 | 1 | 0.7772 | 0.1513 | 0.0449 | 0.0265 |
| 65 95 | 2 | 0.0996 | 0.8596 | 0.0240 | 0.0168 |
| 66 97 | 2 | 0.1162 | 0.6439 | 0.1250 | 0.1149 |
| 67 98 | 2 | 0.0363 | 0.9386 | 0.0139 | 0.0111 |
| 68 99 | 1 | 0.7799 | 0.1825 | 0.0221 | 0.0154 |
| 69 101 | 3 | 0.0606 | 0.0512 | 0.6798 | 0.2084 |
| 70 102 | 4 | 0.0545 | 0.0965 | 0.2236 | 0.6254 |
| 71 103 | 2 | 0.0469 | 0.9324 | 0.0120 | 0.0087 |
| 72 104 | 3 | 0.0231 | 0.0295 | 0.9030 | 0.0444 |
| 73 105 | 4 | 0.0357 | 0.0489 | 0.0987 | 0.8167 |
| 74 107 | 1 | 0.7927 | 0.1597 | 0.0304 | 0.0171 |
| 75 110 | 3 | 0.0299 | 0.0319 | 0.8112 | 0.1270 |
| 76 113 | 2 | 0.2345 | 0.7196 | 0.0282 | 0.0178 |
| 77 114 | 2 | 0.1161 | 0.7364 | 0.0760 | 0.0715 |
| 78 115 | 1 | 0.8263 | 0.1243 | 0.0319 | 0.0175 |
| 79 117 | 1 | 0.4774 | 0.4678 | 0.0339 | 0.0209 |

**Membership Matrix Section**

| Row | Cluster | Prob in 1 | Prob in 2 | Prob in 3 | Prob in 4 |
|---|---|---|---|---|---|
| 80 118 | 3 | 0.0225 | 0.0310 | 0.8057 | 0.1408 |
| 81 120 | 4 | 0.0284 | 0.0350 | 0.1746 | 0.7620 |
| 82 121 | 3 | 0.0129 | 0.0138 | 0.9291 | 0.0442 |
| 83 122 | 3 | 0.0419 | 0.0403 | 0.8680 | 0.0499 |
| 84 124 | 2 | 0.1604 | 0.4078 | 0.1741 | 0.2576 |
| 85 125 | 3 | 0.0733 | 0.0615 | 0.7950 | 0.0702 |
| 86 126 | 2 | 0.0572 | 0.8994 | 0.0243 | 0.0191 |
| 87 127 | 3 | 0.0496 | 0.0840 | 0.6305 | 0.2359 |
| 88 128 | 4 | 0.0403 | 0.0462 | 0.1092 | 0.8043 |
| 89 129 | 2 | 0.1192 | 0.6887 | 0.0871 | 0.1051 |
| 90 130 | 1 | 0.5785 | 0.1628 | 0.1268 | 0.1318 |
| 91 131 | 3 | 0.1699 | 0.1023 | 0.4872 | 0.2406 |
| 92 132 | 1 | 0.4812 | 0.4310 | 0.0549 | 0.0329 |
| 93 133 | 3 | 0.0134 | 0.0176 | 0.9190 | 0.0499 |
| 94 134 | 4 | 0.2245 | 0.1745 | 0.1929 | 0.4082 |
| 95 135 | 2 | 0.0716 | 0.9055 | 0.0135 | 0.0094 |
| 96 136 | 3 | 0.0697 | 0.0543 | 0.7449 | 0.1311 |
| 97 138 | 3 | 0.0481 | 0.0398 | 0.8518 | 0.0604 |
| 98 139 | 2 | 0.2589 | 0.6623 | 0.0488 | 0.0300 |
| 99 140 | 2 | 0.0361 | 0.9487 | 0.0087 | 0.0065 |
| 100 141 | 1 | 0.7669 | 0.1187 | 0.0604 | 0.0540 |
| 101 142 | 1 | 0.3242 | 0.1717 | 0.1938 | 0.3102 |
| 102 143 | 1 | 0.8189 | 0.0989 | 0.0481 | 0.0341 |
| 103 144 | 4 | 0.0843 | 0.1327 | 0.1772 | 0.6057 |
| 104 146 | 1 | 0.6488 | 0.1592 | 0.0978 | 0.0943 |
| 105 147 | 2 | 0.0616 | 0.8993 | 0.0240 | 0.0152 |
| 106 148 | 3 | 0.0129 | 0.0157 | 0.9106 | 0.0608 |
| 107 149 | 2 | 0.0354 | 0.9479 | 0.0097 | 0.0070 |
| 108 150 | 2 | 0.1279 | 0.8005 | 0.0422 | 0.0294 |
| 109 151 | 2 | 0.1052 | 0.8558 | 0.0237 | 0.0153 |
| 110 152 | 3 | 0.0210 | 0.0229 | 0.9238 | 0.0324 |
| 111 153 | 3 | 0.0124 | 0.0134 | 0.9497 | 0.0245 |
| 112 154 | 3 | 0.0282 | 0.0320 | 0.7414 | 0.1984 |
| 113 155 | 3 | 0.0561 | 0.0437 | 0.8306 | 0.0696 |
| 114 156 | 4 | 0.0429 | 0.0726 | 0.2659 | 0.6187 |
| 115 158 | 1 | 0.9214 | 0.0526 | 0.0154 | 0.0105 |
| 116 159 | 3 | 0.0261 | 0.0386 | 0.8258 | 0.1095 |
| 117 161 | 1 | 0.6548 | 0.1470 | 0.1103 | 0.0879 |
| 118 163 | 2 | 0.1444 | 0.6765 | 0.0815 | 0.0977 |
| 119 164 | 1 | 0.6143 | 0.3397 | 0.0273 | 0.0186 |
| 120 165 | 4 | 0.0313 | 0.0354 | 0.1060 | 0.8274 |
| 121 168 | 2 | 0.1044 | 0.7714 | 0.0566 | 0.0676 |
| 122 171 | 2 | 0.0542 | 0.8869 | 0.0308 | 0.0281 |
| 123 172 | 1 | 0.6812 | 0.2333 | 0.0505 | 0.0350 |

**Cluster Medoids Section**

| Variable | Cluster1 | Cluster2 | Cluster3 | Cluster4 | Cluster5 |
|---|---|---|---|---|---|
| Factor1 | 0.2903 | -0.5036 | -0.882 | 1.0082 | 1.0327 |
| Factor2 | -1.0444 | -0.6212 | 0.9945 | 2.2898 | -0.14 |
| Factor3 | -1.0494 | 0.566 | -0.6271 | 0.3485 | 1.0032 |
| Row | 11 14 | 109 151 | 5 6 | 31 43 | 40 60 |

**Membership Summary Section for Clusters = 5**

<table>
<tr><th>Row</th><th>Cluster</th><th>Cluster Membership</th><th>Sum of Squared Memberships</th><th>Bar of Squared Memberships</th><th>Silhouette Amount</th><th>Silhouette Bar</th></tr>
<tr><td>11 14</td><td>1</td><td>0.8822</td><td>0.7831</td><td>||||||||||||||||||||||||</td><td>0.2923</td><td>||||||||||</td></tr>
<tr><td>115 158</td><td>1</td><td>0.8799</td><td>0.7795</td><td>||||||||||||||||||||||||</td><td>0.2484</td><td>||||||||</td></tr>
<tr><td>1 1</td><td>1</td><td>0.8564</td><td>0.7413</td><td>|||||||||||||||||||||||</td><td>0.2068</td><td>|||||||</td></tr>
<tr><td>6 7</td><td>1</td><td>0.8223</td><td>0.6886</td><td>||||||||||||||||||||||</td><td>0.1046</td><td>||||</td></tr>
<tr><td>102 143</td><td>1</td><td>0.7943</td><td>0.6442</td><td>||||||||||||||||||||</td><td>0.3651</td><td>||||||||||||</td></tr>
<tr><td>2 2</td><td>1</td><td>0.7848</td><td>0.6338</td><td>||||||||||||||||||||</td><td>0.1451</td><td>|||||</td></tr>
<tr><td>33 47</td><td>1</td><td>0.7550</td><td>0.5930</td><td>|||||||||||||||||||</td><td>0.1314</td><td>|||||</td></tr>
<tr><td>100 141</td><td>1</td><td>0.7456</td><td>0.5755</td><td>||||||||||||||||||</td><td>0.4218</td><td>||||||||||||||</td></tr>
<tr><td>8 11</td><td>1</td><td>0.7360</td><td>0.5621</td><td>||||||||||||||||||</td><td>0.4374</td><td>||||||||||||||</td></tr>
<tr><td>29 41</td><td>1</td><td>0.7060</td><td>0.5314</td><td>|||||||||||||||||</td><td>0.0634</td><td>|||</td></tr>
<tr><td>46 68</td><td>1</td><td>0.6876</td><td>0.5146</td><td>||||||||||||||||</td><td>-0.0822</td><td>|</td></tr>
<tr><td>10 13</td><td>1</td><td>0.6827</td><td>0.5019</td><td>||||||||||||||||</td><td>0.1183</td><td>|||||</td></tr>
<tr><td>48 72</td><td>1</td><td>0.6791</td><td>0.4935</td><td>||||||||||||||||</td><td>0.2544</td><td>|||||||||</td></tr>
<tr><td>62 91</td><td>1</td><td>0.6764</td><td>0.4876</td><td>||||||||||||||||</td><td>0.4267</td><td>||||||||||||||</td></tr>
<tr><td>78 115</td><td>1</td><td>0.6436</td><td>0.4665</td><td>|||||||||||||||</td><td>-0.1060</td><td>|</td></tr>
<tr><td>117 161</td><td>1</td><td>0.6299</td><td>0.4342</td><td>||||||||||||||</td><td>0.3990</td><td>|||||||||||||</td></tr>
<tr><td>64 93</td><td>1</td><td>0.6205</td><td>0.4447</td><td>||||||||||||||</td><td>-0.0821</td><td>|</td></tr>
<tr><td>38 56</td><td>1</td><td>0.6119</td><td>0.4211</td><td>||||||||||||||</td><td>0.2000</td><td>|||||||</td></tr>
<tr><td>19 29</td><td>1</td><td>0.6039</td><td>0.4215</td><td>||||||||||||||</td><td>0.1758</td><td>||||||</td></tr>
<tr><td>104 146</td><td>1</td><td>0.5889</td><td>0.3966</td><td>|||||||||||||</td><td>0.3150</td><td>||||||||||</td></tr>
<tr><td>59 87</td><td>1</td><td>0.5845</td><td>0.4087</td><td>|||||||||||||</td><td>-0.0506</td><td>|</td></tr>
<tr><td>90 130</td><td>1</td><td>0.5531</td><td>0.3591</td><td>||||||||||||</td><td>0.4045</td><td>|||||||||||||</td></tr>
<tr><td>74 107</td><td>1</td><td>0.5523</td><td>0.3989</td><td>|||||||||||||</td><td>-0.2442</td><td>|</td></tr>
<tr><td>68 99</td><td>1</td><td>0.5319</td><td>0.3894</td><td>|||||||||||||</td><td>-0.2656</td><td>|</td></tr>
<tr><td>123 172</td><td>1</td><td>0.4596</td><td>0.3278</td><td>|||||||||||</td><td>-0.0745</td><td>|</td></tr>
<tr><td>34 49</td><td>1</td><td>0.4071</td><td>0.3155</td><td>||||||||||</td><td>-0.2046</td><td>|</td></tr>
<tr><td>41 61</td><td>1</td><td>0.3976</td><td>0.2509</td><td>|||||||||</td><td>0.3072</td><td>||||||||||</td></tr>
<tr><td>24 36</td><td>1</td><td>0.3219</td><td>0.2229</td><td>||||||||</td><td>0.1297</td><td>|||||</td></tr>
<tr><td>101 142</td><td>1</td><td>0.3039</td><td>0.2164</td><td>|||||||</td><td>0.1850</td><td>|||||||</td></tr>
<tr><td>42 63</td><td>1</td><td>0.2710</td><td>0.2114</td><td>|||||||</td><td>0.1162</td><td>||||</td></tr>
<tr><td>109 151</td><td>2</td><td>0.8822</td><td>0.7851</td><td>|||||||||||||||||||||||||</td><td>0.5919</td><td>|||||||||||||||||||</td></tr>
<tr><td>37 55</td><td>2</td><td>0.8746</td><td>0.7732</td><td>||||||||||||||||||||||||</td><td>0.5695</td><td>||||||||||||||||||</td></tr>
<tr><td>65 95</td><td>2</td><td>0.8566</td><td>0.7441</td><td>|||||||||||||||||||||||</td><td>0.5803</td><td>||||||||||||||||||</td></tr>
<tr><td>4 4</td><td>2</td><td>0.8377</td><td>0.7130</td><td>||||||||||||||||||||||</td><td>0.5839</td><td>|||||||||||||||||||</td></tr>
<tr><td>107 149</td><td>2</td><td>0.8321</td><td>0.7117</td><td>||||||||||||||||||||||</td><td>0.4856</td><td>||||||||||||||||</td></tr>
</table>

**Membership Summary Section for Clusters = 5**

<table>
<tr><th>Row</th><th>Cluster</th><th>Cluster Membership</th><th>Sum of Squared Memberships</th><th>Bar of Squared Memberships</th><th>Silhouette Amount</th><th>Silhouette Bar</th></tr>
<tr><td>9 12</td><td>2</td><td>0.8188</td><td>0.6915</td><td>||||||||||||||||||||||</td><td>0.4695</td><td>|||||||||||||||</td></tr>
<tr><td>22 34</td><td>2</td><td>0.8007</td><td>0.6696</td><td>|||||||||||||||||||||</td><td>0.4457</td><td>||||||||||||||</td></tr>
<tr><td>99 140</td><td>2</td><td>0.7811</td><td>0.6447</td><td>||||||||||||||||||||</td><td>0.4290</td><td>||||||||||||||</td></tr>
<tr><td>95 135</td><td>2</td><td>0.7737</td><td>0.6320</td><td>||||||||||||||||||||</td><td>0.4305</td><td>||||||||||||||</td></tr>
<tr><td>49 73</td><td>2</td><td>0.7651</td><td>0.6150</td><td>|||||||||||||||||||</td><td>0.5031</td><td>||||||||||||||||</td></tr>
<tr><td>98 139</td><td>2</td><td>0.7643</td><td>0.6057</td><td>|||||||||||||||||||</td><td>0.5701</td><td>||||||||||||||||||</td></tr>
<tr><td>76 113</td><td>2</td><td>0.7586</td><td>0.6023</td><td>|||||||||||||||||||</td><td>0.4862</td><td>||||||||||||||||</td></tr>
<tr><td>108 150</td><td>2</td><td>0.7576</td><td>0.6005</td><td>|||||||||||||||||||</td><td>0.5303</td><td>|||||||||||||||||</td></tr>
<tr><td>86 126</td><td>2</td><td>0.6892</td><td>0.5349</td><td>|||||||||||||||||</td><td>0.4141</td><td>|||||||||||||</td></tr>
<tr><td>36 54</td><td>2</td><td>0.6873</td><td>0.5280</td><td>|||||||||||||||||</td><td>0.4271</td><td>||||||||||||||</td></tr>
<tr><td>39 58</td><td>2</td><td>0.6855</td><td>0.5287</td><td>|||||||||||||||||</td><td>0.4172</td><td>||||||||||||||</td></tr>
<tr><td>30 42</td><td>2</td><td>0.6769</td><td>0.5009</td><td>||||||||||||||||</td><td>0.5404</td><td>|||||||||||||||||</td></tr>
<tr><td>105 147</td><td>2</td><td>0.6720</td><td>0.5228</td><td>|||||||||||||||||</td><td>0.3622</td><td>||||||||||||</td></tr>
<tr><td>67 98</td><td>2</td><td>0.6573</td><td>0.5175</td><td>|||||||||||||||||</td><td>0.3478</td><td>|||||||||||</td></tr>
<tr><td>79 117</td><td>2</td><td>0.6269</td><td>0.4524</td><td>|||||||||||||||</td><td>0.4692</td><td>|||||||||||||||</td></tr>
<tr><td>71 103</td><td>2</td><td>0.5956</td><td>0.4814</td><td>|||||||||||||||</td><td>0.2755</td><td>|||||||||</td></tr>
<tr><td>92 132</td><td>2</td><td>0.5950</td><td>0.4210</td><td>||||||||||||||</td><td>0.5157</td><td>||||||||||||||||</td></tr>
<tr><td>28 40</td><td>2</td><td>0.5720</td><td>0.3991</td><td>|||||||||||||</td><td>0.5020</td><td>||||||||||||||||</td></tr>
<tr><td>32 46</td><td>2</td><td>0.5504</td><td>0.4323</td><td>||||||||||||||</td><td>0.2587</td><td>|||||||||</td></tr>
<tr><td>7 10</td><td>2</td><td>0.5242</td><td>0.3788</td><td>||||||||||||</td><td>0.4516</td><td>|||||||||||||||</td></tr>
<tr><td>55 83</td><td>2</td><td>0.5193</td><td>0.4601</td><td>|||||||||||||||</td><td>0.2072</td><td>|||||||</td></tr>
<tr><td>119 164</td><td>2</td><td>0.4722</td><td>0.3548</td><td>||||||||||||</td><td>0.3876</td><td>|||||||||||||</td></tr>
<tr><td>51 75</td><td>2</td><td>0.4573</td><td>0.3564</td><td>||||||||||||</td><td>0.2077</td><td>|||||||</td></tr>
<tr><td>77 114</td><td>2</td><td>0.4413</td><td>0.3516</td><td>||||||||||||</td><td>0.1352</td><td>|||||</td></tr>
<tr><td>5 6</td><td>3</td><td>0.9562</td><td>0.9149</td><td>||||||||||||||||||||||||||||</td><td>0.7224</td><td>|||||||||||||||||||||||</td></tr>
<tr><td>61 90</td><td>3</td><td>0.9534</td><td>0.9096</td><td>||||||||||||||||||||||||||||</td><td>0.7230</td><td>|||||||||||||||||||||||</td></tr>
<tr><td>17 26</td><td>3</td><td>0.9529</td><td>0.9087</td><td>||||||||||||||||||||||||||||</td><td>0.7135</td><td>||||||||||||||||||||||</td></tr>
<tr><td>20 31</td><td>3</td><td>0.9477</td><td>0.8990</td><td>||||||||||||||||||||||||||||</td><td>0.7062</td><td>||||||||||||||||||||||</td></tr>
<tr><td>111 153</td><td>3</td><td>0.9450</td><td>0.8938</td><td>||||||||||||||||||||||||||||</td><td>0.7289</td><td>|||||||||||||||||||||||</td></tr>
<tr><td>43 64</td><td>3</td><td>0.9327</td><td>0.8715</td><td>|||||||||||||||||||||||||||</td><td>0.7168</td><td>|||||||||||||||||||||||</td></tr>
<tr><td>82 121</td><td>3</td><td>0.9255</td><td>0.8583</td><td>|||||||||||||||||||||||||||</td><td>0.7235</td><td>|||||||||||||||||||||||</td></tr>
<tr><td>110 152</td><td>3</td><td>0.9116</td><td>0.8330</td><td>||||||||||||||||||||||||||</td><td>0.6862</td><td>||||||||||||||||||||||</td></tr>
<tr><td>93 133</td><td>3</td><td>0.9108</td><td>0.8322</td><td>||||||||||||||||||||||||||</td><td>0.7009</td><td>||||||||||||||||||||||</td></tr>
<tr><td>106 148</td><td>3</td><td>0.9048</td><td>0.8220</td><td>||||||||||||||||||||||||||</td><td>0.7061</td><td>||||||||||||||||||||||</td></tr>
<tr><td>72 104</td><td>3</td><td>0.8862</td><td>0.7887</td><td>|||||||||||||||||||||||||</td><td>0.6616</td><td>|||||||||||||||||||||</td></tr>
<tr><td>15 21</td><td>3</td><td>0.8836</td><td>0.7842</td><td>|||||||||||||||||||||||||</td><td>0.6593</td><td>|||||||||||||||||||||</td></tr>
<tr><td>57 85</td><td>3</td><td>0.8715</td><td>0.7651</td><td>||||||||||||||||||||||||</td><td>0.7024</td><td>||||||||||||||||||||||</td></tr>
<tr><td>83 122</td><td>3</td><td>0.8434</td><td>0.7174</td><td>|||||||||||||||||||||||</td><td>0.6435</td><td>||||||||||||||||||||</td></tr>
<tr><td>97 138</td><td>3</td><td>0.8250</td><td>0.6884</td><td>||||||||||||||||||||||</td><td>0.6496</td><td>||||||||||||||||||||</td></tr>
<tr><td>13 19</td><td>3</td><td>0.8126</td><td>0.6721</td><td>|||||||||||||||||||||</td><td>0.6100</td><td>|||||||||||||||||||</td></tr>
<tr><td>113 155</td><td>3</td><td>0.8021</td><td>0.6533</td><td>|||||||||||||||||||||</td><td>0.6526</td><td>|||||||||||||||||||||</td></tr>
<tr><td>116 159</td><td>3</td><td>0.7998</td><td>0.6533</td><td>|||||||||||||||||||||</td><td>0.6250</td><td>||||||||||||||||||||</td></tr>
</table>

**Membership Summary Section for Clusters = 5**

<table>
<tr><th>Row</th><th>Cluster</th><th>Cluster Membership</th><th>Sum of Squared Memberships</th><th>Bar of Squared Memberships</th><th>Silhouette Amount</th><th>Silhouette Bar</th></tr>
<tr><td>75 110</td><td>3</td><td>0.7970</td><td>0.6497</td><td>||||||||||||||||||||</td><td>0.6381</td><td>||||||||||||||||||||</td></tr>
<tr><td>45 67</td><td>3</td><td>0.7924</td><td>0.6387</td><td>||||||||||||||||||||</td><td>0.6157</td><td>|||||||||||||||||||</td></tr>
<tr><td>80 118</td><td>3</td><td>0.7837</td><td>0.6341</td><td>||||||||||||||||||||</td><td>0.6363</td><td>||||||||||||||||||||</td></tr>
<tr><td>21 32</td><td>3</td><td>0.7678</td><td>0.6109</td><td>|||||||||||||||||||</td><td>0.6062</td><td>|||||||||||||||||||</td></tr>
<tr><td>85 125</td><td>3</td><td>0.7564</td><td>0.5870</td><td>|||||||||||||||||||</td><td>0.5960</td><td>|||||||||||||||||||</td></tr>
<tr><td>47 71</td><td>3</td><td>0.7424</td><td>0.5682</td><td>||||||||||||||||||</td><td>0.6314</td><td>||||||||||||||||||||</td></tr>
<tr><td>54 82</td><td>3</td><td>0.7273</td><td>0.5548</td><td>||||||||||||||||||</td><td>0.5823</td><td>||||||||||||||||||</td></tr>
<tr><td>112 154</td><td>3</td><td>0.7264</td><td>0.5630</td><td>||||||||||||||||||</td><td>0.6459</td><td>||||||||||||||||||||</td></tr>
<tr><td>96 136</td><td>3</td><td>0.7158</td><td>0.5345</td><td>|||||||||||||||||</td><td>0.6429</td><td>||||||||||||||||||||</td></tr>
<tr><td>69 101</td><td>3</td><td>0.6618</td><td>0.4765</td><td>|||||||||||||||</td><td>0.6175</td><td>||||||||||||||||||||</td></tr>
<tr><td>87 127</td><td>3</td><td>0.5751</td><td>0.3945</td><td>|||||||||||||</td><td>0.4834</td><td>||||||||||||||||</td></tr>
<tr><td>23 35</td><td>3</td><td>0.5098</td><td>0.3230</td><td>|||||||||||</td><td>0.4473</td><td>||||||||||||||</td></tr>
<tr><td>91 131</td><td>3</td><td>0.4438</td><td>0.2788</td><td>|||||||||</td><td>0.3921</td><td>|||||||||||||</td></tr>
<tr><td>31 43</td><td>4</td><td>0.8770</td><td>0.7744</td><td>||||||||||||||||||||||||</td><td>-0.2703</td><td>|</td></tr>
<tr><td>73 105</td><td>4</td><td>0.8349</td><td>0.7049</td><td>||||||||||||||||||||||</td><td>-0.0550</td><td>|</td></tr>
<tr><td>120 165</td><td>4</td><td>0.8309</td><td>0.6999</td><td>||||||||||||||||||||||</td><td>-0.1985</td><td>|</td></tr>
<tr><td>88 128</td><td>4</td><td>0.8023</td><td>0.6554</td><td>|||||||||||||||||||||</td><td>-0.0610</td><td>|</td></tr>
<tr><td>81 120</td><td>4</td><td>0.7691</td><td>0.6147</td><td>|||||||||||||||||||</td><td>-0.4655</td><td>|</td></tr>
<tr><td>60 89</td><td>4</td><td>0.7055</td><td>0.5236</td><td>|||||||||||||||||</td><td>-0.2638</td><td>|</td></tr>
<tr><td>70 102</td><td>4</td><td>0.6281</td><td>0.4388</td><td>||||||||||||||</td><td>-0.3858</td><td>|</td></tr>
<tr><td>114 156</td><td>4</td><td>0.6225</td><td>0.4434</td><td>||||||||||||||</td><td>-0.5046</td><td>|</td></tr>
<tr><td>103 144</td><td>4</td><td>0.5724</td><td>0.3769</td><td>||||||||||||</td><td>-0.0522</td><td>|</td></tr>
<tr><td>52 77</td><td>4</td><td>0.5626</td><td>0.3790</td><td>||||||||||||</td><td>-0.3822</td><td>|</td></tr>
<tr><td>63 92</td><td>4</td><td>0.4696</td><td>0.2958</td><td>||||||||||</td><td>-0.1346</td><td>|</td></tr>
<tr><td>50 74</td><td>4</td><td>0.3656</td><td>0.2371</td><td>||||||||</td><td>-0.0260</td><td>|</td></tr>
<tr><td>94 134</td><td>4</td><td>0.2963</td><td>0.2140</td><td>|||||||</td><td>-0.1388</td><td>|</td></tr>
<tr><td>18 27</td><td>4</td><td>0.2258</td><td>0.2015</td><td>|||||||</td><td>-0.0317</td><td>|</td></tr>
<tr><td>40 60</td><td>5</td><td>0.8325</td><td>0.7070</td><td>||||||||||||||||||||||</td><td>0.3999</td><td>|||||||||||||</td></tr>
<tr><td>16 22</td><td>5</td><td>0.8070</td><td>0.6740</td><td>|||||||||||||||||||||</td><td>0.2559</td><td>|||||||||</td></tr>
<tr><td>3 3</td><td>5</td><td>0.8042</td><td>0.6662</td><td>|||||||||||||||||||||</td><td>0.3554</td><td>||||||||||||</td></tr>
<tr><td>118 163</td><td>5</td><td>0.7930</td><td>0.6446</td><td>||||||||||||||||||||</td><td>0.4483</td><td>||||||||||||||</td></tr>
<tr><td>44 65</td><td>5</td><td>0.7745</td><td>0.6205</td><td>||||||||||||||||||||</td><td>0.3456</td><td>|||||||||||</td></tr>
<tr><td>121 168</td><td>5</td><td>0.7593</td><td>0.6029</td><td>|||||||||||||||||||</td><td>0.3783</td><td>||||||||||||</td></tr>
<tr><td>26 38</td><td>5</td><td>0.7522</td><td>0.6078</td><td>|||||||||||||||||||</td><td>0.1606</td><td>||||||</td></tr>
<tr><td>58 86</td><td>5</td><td>0.7333</td><td>0.5640</td><td>||||||||||||||||||</td><td>0.3735</td><td>||||||||||||</td></tr>
<tr><td>27 39</td><td>5</td><td>0.7127</td><td>0.5366</td><td>|||||||||||||||||</td><td>0.3599</td><td>||||||||||||</td></tr>
<tr><td>122 171</td><td>5</td><td>0.7007</td><td>0.5479</td><td>|||||||||||||||||</td><td>0.1449</td><td>|||||</td></tr>
<tr><td>66 97</td><td>5</td><td>0.6899</td><td>0.5096</td><td>||||||||||||||||</td><td>0.3331</td><td>|||||||||||</td></tr>
<tr><td>35 52</td><td>5</td><td>0.6709</td><td>0.5217</td><td>|||||||||||||||||</td><td>0.0434</td><td>||</td></tr>
<tr><td>14 20</td><td>5</td><td>0.6436</td><td>0.5015</td><td>||||||||||||||||</td><td>0.0468</td><td>||</td></tr>
<tr><td>53 80</td><td>5</td><td>0.5683</td><td>0.3935</td><td>|||||||||||||</td><td>0.1919</td><td>|||||||</td></tr>
<tr><td>89 129</td><td>5</td><td>0.5273</td><td>0.3721</td><td>||||||||||||</td><td>0.1603</td><td>||||||</td></tr>
</table>

**Membership Summary Section for Clusters = 5**

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<tr><td>25 37</td><td>5</td><td>0.5081</td><td>0.3959</td><td>|IIIIIIIIIIII</td><td>-0.0908</td><td>|</td></tr>
<tr><td>56 84</td><td>5</td><td>0.4934</td><td>0.3115</td><td>|IIIIIIIII</td><td>0.3737</td><td>|IIIIIIIIIII</td></tr>
<tr><td>12 15</td><td>5</td><td>0.4883</td><td>0.3486</td><td>|IIIIIIIIII</td><td>0.0072</td><td>|</td></tr>
<tr><td>84 124</td><td>5</td><td>0.3269</td><td>0.2330</td><td>|IIIIIII</td><td>0.0879</td><td>|III</td></tr>
</table>

**Membership Matrix Section**

| Row | Cluster | Prob in 1 | Prob in 2 | Prob in 3 | Prob in 4 | Prob in 5 |
|---|---|---|---|---|---|---|
| 1 1 | 1 | 0.8564 | 0.0710 | 0.0134 | 0.0080 | 0.0511 |
| 2 2 | 1 | 0.7848 | 0.0986 | 0.0178 | 0.0108 | 0.0880 |
| 3 3 | 5 | 0.0253 | 0.1350 | 0.0191 | 0.0165 | 0.8042 |
| 4 4 | 2 | 0.0535 | 0.8377 | 0.0118 | 0.0064 | 0.0905 |
| 5 6 | 3 | 0.0073 | 0.0091 | 0.9562 | 0.0161 | 0.0112 |
| 6 7 | 1 | 0.8223 | 0.0946 | 0.0181 | 0.0092 | 0.0559 |
| 7 10 | 2 | 0.2893 | 0.5242 | 0.0328 | 0.0161 | 0.1376 |
| 8 11 | 1 | 0.7360 | 0.0881 | 0.0459 | 0.0330 | 0.0970 |
| 9 12 | 2 | 0.0268 | 0.8188 | 0.0073 | 0.0043 | 0.1428 |
| 10 13 | 1 | 0.6827 | 0.1580 | 0.0449 | 0.0230 | 0.0914 |
| 11 14 | 1 | 0.8822 | 0.0544 | 0.0153 | 0.0082 | 0.0400 |
| 12 15 | 5 | 0.1898 | 0.2696 | 0.0323 | 0.0199 | 0.4883 |
| 13 19 | 3 | 0.0209 | 0.0303 | 0.8126 | 0.0929 | 0.0433 |
| 14 20 | 5 | 0.0388 | 0.2925 | 0.0139 | 0.0113 | 0.6436 |
| 15 21 | 3 | 0.0226 | 0.0286 | 0.8836 | 0.0340 | 0.0312 |
| 16 22 | 5 | 0.0264 | 0.1477 | 0.0105 | 0.0083 | 0.8070 |
| 17 26 | 3 | 0.0076 | 0.0093 | 0.9529 | 0.0180 | 0.0121 |
| 18 27 | 4 | 0.2141 | 0.1772 | 0.1903 | 0.2258 | 0.1926 |
| 19 29 | 1 | 0.6039 | 0.1336 | 0.0431 | 0.0290 | 0.1904 |
| 20 31 | 3 | 0.0081 | 0.0105 | 0.9477 | 0.0202 | 0.0135 |
| 21 32 | 3 | 0.0232 | 0.0299 | 0.7678 | 0.1337 | 0.0453 |
| 22 34 | 2 | 0.0208 | 0.8007 | 0.0070 | 0.0045 | 0.1670 |
| 23 35 | 3 | 0.1687 | 0.1156 | 0.5098 | 0.0951 | 0.1108 |
| 24 36 | 1 | 0.3219 | 0.1376 | 0.1561 | 0.1601 | 0.2242 |
| 25 37 | 5 | 0.1054 | 0.3551 | 0.0185 | 0.0130 | 0.5081 |
| 26 38 | 5 | 0.0229 | 0.2030 | 0.0123 | 0.0096 | 0.7522 |
| 27 39 | 5 | 0.0811 | 0.1409 | 0.0353 | 0.0300 | 0.7127 |
| 28 40 | 2 | 0.2185 | 0.5720 | 0.0395 | 0.0211 | 0.1488 |
| 29 41 | 1 | 0.7060 | 0.1327 | 0.0268 | 0.0143 | 0.1203 |
| 30 42 | 2 | 0.1622 | 0.6769 | 0.0235 | 0.0123 | 0.1252 |
| 31 43 | 4 | 0.0145 | 0.0183 | 0.0624 | 0.8770 | 0.0278 |
| 32 46 | 2 | 0.0471 | 0.5504 | 0.0267 | 0.0208 | 0.3550 |
| 33 47 | 1 | 0.7550 | 0.1287 | 0.0274 | 0.0152 | 0.0737 |
| 34 49 | 1 | 0.4071 | 0.2588 | 0.0302 | 0.0183 | 0.2856 |
| 35 52 | 5 | 0.0440 | 0.2634 | 0.0127 | 0.0090 | 0.6709 |

**Membership Matrix Section**

| Row | Cluster | Prob in 1 | Prob in 2 | Prob in 3 | Prob in 4 | Prob in 5 |
|---|---|---|---|---|---|---|
| 36 54 | 2 | 0.0446 | 0.6873 | 0.0224 | 0.0159 | 0.2298 |
| 37 55 | 2 | 0.0243 | 0.8746 | 0.0087 | 0.0049 | 0.0875 |
| 38 56 | 1 | 0.6119 | 0.1658 | 0.0712 | 0.0385 | 0.1127 |
| 39 58 | 2 | 0.0412 | 0.6855 | 0.0208 | 0.0148 | 0.2377 |
| 40 60 | 5 | 0.0253 | 0.1139 | 0.0147 | 0.0136 | 0.8325 |
| 41 61 | 1 | 0.3976 | 0.1584 | 0.1290 | 0.1300 | 0.1849 |
| 42 63 | 1 | 0.2710 | 0.1448 | 0.1482 | 0.2203 | 0.2157 |
| 43 64 | 3 | 0.0087 | 0.0105 | 0.9327 | 0.0340 | 0.0141 |
| 44 65 | 5 | 0.0510 | 0.1302 | 0.0252 | 0.0190 | 0.7745 |
| 45 67 | 3 | 0.0516 | 0.0522 | 0.7924 | 0.0509 | 0.0529 |
| 46 68 | 1 | 0.6876 | 0.1696 | 0.0197 | 0.0111 | 0.1120 |
| 47 71 | 3 | 0.0666 | 0.0502 | 0.7424 | 0.0800 | 0.0608 |
| 48 72 | 1 | 0.6791 | 0.1381 | 0.0561 | 0.0309 | 0.0958 |
| 49 73 | 2 | 0.0386 | 0.7651 | 0.0182 | 0.0118 | 0.1664 |
| 50 74 | 4 | 0.1166 | 0.1556 | 0.1770 | 0.3656 | 0.1853 |
| 51 75 | 2 | 0.1633 | 0.4573 | 0.0199 | 0.0131 | 0.3464 |
| 52 77 | 4 | 0.0734 | 0.0603 | 0.2124 | 0.5626 | 0.0912 |
| 53 80 | 5 | 0.1683 | 0.2004 | 0.0365 | 0.0265 | 0.5683 |
| 54 82 | 3 | 0.0291 | 0.0448 | 0.7273 | 0.1397 | 0.0591 |
| 55 83 | 2 | 0.0275 | 0.5193 | 0.0107 | 0.0071 | 0.4354 |
| 56 84 | 5 | 0.0919 | 0.1516 | 0.0999 | 0.1632 | 0.4934 |
| 57 85 | 3 | 0.0192 | 0.0190 | 0.8715 | 0.0649 | 0.0254 |
| 58 86 | 5 | 0.0394 | 0.1464 | 0.0433 | 0.0377 | 0.7333 |
| 59 87 | 1 | 0.5845 | 0.2257 | 0.0503 | 0.0260 | 0.1135 |
| 60 89 | 4 | 0.0354 | 0.0553 | 0.1219 | 0.7055 | 0.0820 |
| 61 90 | 3 | 0.0077 | 0.0098 | 0.9534 | 0.0172 | 0.0118 |
| 62 91 | 1 | 0.6764 | 0.1026 | 0.0571 | 0.0442 | 0.1198 |
| 63 92 | 4 | 0.1217 | 0.0921 | 0.1884 | 0.4696 | 0.1281 |
| 64 93 | 1 | 0.6205 | 0.2175 | 0.0398 | 0.0201 | 0.1021 |
| 65 95 | 2 | 0.0315 | 0.8566 | 0.0101 | 0.0062 | 0.0956 |
| 66 97 | 5 | 0.0458 | 0.1622 | 0.0571 | 0.0450 | 0.6899 |
| 67 98 | 2 | 0.0287 | 0.6573 | 0.0139 | 0.0097 | 0.2904 |
| 68 99 | 1 | 0.5319 | 0.2938 | 0.0220 | 0.0129 | 0.1394 |
| 69 101 | 3 | 0.0577 | 0.0475 | 0.6618 | 0.1705 | 0.0625 |
| 70 102 | 4 | 0.0398 | 0.0653 | 0.1713 | 0.6281 | 0.0954 |
| 71 103 | 2 | 0.0323 | 0.5956 | 0.0111 | 0.0069 | 0.3541 |
| 72 104 | 3 | 0.0196 | 0.0268 | 0.8862 | 0.0371 | 0.0304 |
| 73 105 | 4 | 0.0239 | 0.0298 | 0.0670 | 0.8349 | 0.0444 |
| 74 107 | 1 | 0.5523 | 0.2780 | 0.0309 | 0.0147 | 0.1241 |
| 75 110 | 3 | 0.0276 | 0.0284 | 0.7970 | 0.1055 | 0.0415 |
| 76 113 | 2 | 0.0761 | 0.7586 | 0.0136 | 0.0073 | 0.1445 |
| 77 114 | 2 | 0.0729 | 0.4413 | 0.0557 | 0.0477 | 0.3823 |
| 78 115 | 1 | 0.6436 | 0.1956 | 0.0330 | 0.0151 | 0.1127 |
| 79 117 | 2 | 0.1878 | 0.6269 | 0.0208 | 0.0109 | 0.1535 |

**Membership Matrix Section**

| Row | Cluster | Prob in 1 | Prob in 2 | Prob in 3 | Prob in 4 | Prob in 5 |
|---|---|---|---|---|---|---|
| 80 118 | 3 | 0.0201 | 0.0268 | 0.7837 | 0.1315 | 0.0379 |
| 81 120 | 4 | 0.0228 | 0.0257 | 0.1425 | 0.7691 | 0.0399 |
| 82 121 | 3 | 0.0112 | 0.0119 | 0.9255 | 0.0356 | 0.0158 |
| 83 122 | 3 | 0.0364 | 0.0390 | 0.8434 | 0.0405 | 0.0407 |
| 84 124 | 5 | 0.1083 | 0.2541 | 0.1272 | 0.1835 | 0.3269 |
| 85 125 | 3 | 0.0647 | 0.0610 | 0.7564 | 0.0565 | 0.0614 |
| 86 126 | 2 | 0.0369 | 0.6892 | 0.0195 | 0.0136 | 0.2408 |
| 87 127 | 3 | 0.0419 | 0.0697 | 0.5751 | 0.2204 | 0.0929 |
| 88 128 | 4 | 0.0315 | 0.0331 | 0.0852 | 0.8023 | 0.0479 |
| 89 129 | 5 | 0.0676 | 0.2874 | 0.0564 | 0.0614 | 0.5273 |
| 90 130 | 1 | 0.5531 | 0.1265 | 0.0923 | 0.0779 | 0.1501 |
| 91 131 | 3 | 0.1635 | 0.0943 | 0.4438 | 0.1780 | 0.1204 |
| 92 132 | 2 | 0.2157 | 0.5950 | 0.0337 | 0.0175 | 0.1381 |
| 93 133 | 3 | 0.0115 | 0.0152 | 0.9108 | 0.0431 | 0.0194 |
| 94 134 | 4 | 0.2047 | 0.1422 | 0.1636 | 0.2963 | 0.1933 |
| 95 135 | 2 | 0.0329 | 0.7737 | 0.0087 | 0.0051 | 0.1796 |
| 96 136 | 3 | 0.0650 | 0.0517 | 0.7158 | 0.1072 | 0.0602 |
| 97 138 | 3 | 0.0437 | 0.0381 | 0.8250 | 0.0480 | 0.0452 |
| 98 139 | 2 | 0.0857 | 0.7643 | 0.0219 | 0.0118 | 0.1164 |
| 99 140 | 2 | 0.0225 | 0.7811 | 0.0072 | 0.0046 | 0.1845 |
| 100 141 | 1 | 0.7456 | 0.0885 | 0.0402 | 0.0294 | 0.0963 |
| 101 142 | 1 | 0.3039 | 0.1375 | 0.1587 | 0.1989 | 0.2009 |
| 102 143 | 1 | 0.7943 | 0.0859 | 0.0327 | 0.0197 | 0.0675 |
| 103 144 | 4 | 0.0645 | 0.0943 | 0.1402 | 0.5724 | 0.1287 |
| 104 146 | 1 | 0.5889 | 0.1192 | 0.0712 | 0.0548 | 0.1659 |
| 105 147 | 2 | 0.0360 | 0.6720 | 0.0184 | 0.0100 | 0.2636 |
| 106 148 | 3 | 0.0112 | 0.0135 | 0.9048 | 0.0522 | 0.0183 |
| 107 149 | 2 | 0.0191 | 0.8321 | 0.0069 | 0.0043 | 0.1376 |
| 108 150 | 2 | 0.0544 | 0.7576 | 0.0227 | 0.0141 | 0.1513 |
| 109 151 | 2 | 0.0273 | 0.8822 | 0.0084 | 0.0047 | 0.0775 |
| 110 152 | 3 | 0.0178 | 0.0211 | 0.9116 | 0.0262 | 0.0234 |
| 111 153 | 3 | 0.0103 | 0.0118 | 0.9450 | 0.0193 | 0.0137 |
| 112 154 | 3 | 0.0259 | 0.0282 | 0.7264 | 0.1796 | 0.0399 |
| 113 155 | 3 | 0.0514 | 0.0424 | 0.8021 | 0.0559 | 0.0481 |
| 114 156 | 4 | 0.0330 | 0.0513 | 0.2144 | 0.6225 | 0.0788 |
| 115 158 | 1 | 0.8799 | 0.0567 | 0.0125 | 0.0071 | 0.0438 |
| 116 159 | 3 | 0.0228 | 0.0337 | 0.7998 | 0.0998 | 0.0439 |
| 117 161 | 1 | 0.6299 | 0.1217 | 0.0788 | 0.0534 | 0.1162 |
| 118 163 | 5 | 0.0411 | 0.1122 | 0.0268 | 0.0268 | 0.7930 |
| 119 164 | 2 | 0.3153 | 0.4722 | 0.0217 | 0.0125 | 0.1784 |
| 120 165 | 4 | 0.0243 | 0.0252 | 0.0824 | 0.8309 | 0.0371 |
| 121 168 | 5 | 0.0380 | 0.1541 | 0.0240 | 0.0247 | 0.7593 |
| 122 171 | 5 | 0.0285 | 0.2356 | 0.0196 | 0.0156 | 0.7007 |
| 123 172 | 1 | 0.4596 | 0.2066 | 0.0423 | 0.0241 | 0.2675 |

**Cluster Medoids Section**

| Variable | Cluster1 | Cluster2 | Cluster3 | Cluster4 | Cluster5 | Cluster6 |
|---|---|---|---|---|---|---|
| Factor1 | -0.0199 | -0.0853 | 1.0082 | 1.0327 | -0.882 | 2.2997 |
| Factor2 | -0.982 | -0.4938 | 2.2898 | -0.14 | 0.9945 | -1.0495 |
| Factor3 | -0.7548 | 0.7214 | 0.3485 | 1.0032 | -0.6271 | -1.6501 |
| Row | 6 7 | 107 149 | 31 43 | 40 60 | 5 6 | 62 91 |

**Membership Summary Section for Clusters = 6**

<table>
<tr><th>Row</th><th>Cluster</th><th>Cluster Membership</th><th>Sum of Squared Memberships</th><th>Bar of Squared Memberships</th><th>Silhouette Amount</th><th>Silhouette Bar</th></tr>
<tr><td>6 7</td><td>1</td><td>0.8996</td><td>0.8120</td><td>|IIIIIIIIIIIIIIIIIIIIIIII</td><td>0.5218</td><td>|IIIIIIIIIIIIIIII</td></tr>
<tr><td>1 1</td><td>1</td><td>0.8344</td><td>0.7038</td><td>|IIIIIIIIIIIIIIIIIIIII</td><td>0.5093</td><td>|IIIIIIIIIIIIIII</td></tr>
<tr><td>115 158</td><td>1</td><td>0.8334</td><td>0.7025</td><td>|IIIIIIIIIIIIIIIIIIIII</td><td>0.5200</td><td>|IIIIIIIIIIIIIIII</td></tr>
<tr><td>46 68</td><td>1</td><td>0.8240</td><td>0.6883</td><td>|IIIIIIIIIIIIIIIIIIIII</td><td>0.3963</td><td>|IIIIIIIIIIII</td></tr>
<tr><td>11 14</td><td>1</td><td>0.8212</td><td>0.6834</td><td>|IIIIIIIIIIIIIIIIIIIII</td><td>0.5425</td><td>|IIIIIIIIIIIIIIII</td></tr>
<tr><td>78 115</td><td>1</td><td>0.8117</td><td>0.6692</td><td>|IIIIIIIIIIIIIIIIIIII</td><td>0.3912</td><td>|IIIIIIIIIIII</td></tr>
<tr><td>74 107</td><td>1</td><td>0.8085</td><td>0.6662</td><td>|IIIIIIIIIIIIIIIIIIII</td><td>0.3339</td><td>|IIIIIIIIII</td></tr>
<tr><td>33 47</td><td>1</td><td>0.7949</td><td>0.6431</td><td>|IIIIIIIIIIIIIIIIIII</td><td>0.4936</td><td>|IIIIIIIIIIIIIII</td></tr>
<tr><td>64 93</td><td>1</td><td>0.7653</td><td>0.6018</td><td>|IIIIIIIIIIIIIIIIII</td><td>0.4120</td><td>|IIIIIIIIIIII</td></tr>
<tr><td>68 99</td><td>1</td><td>0.7647</td><td>0.6048</td><td>|IIIIIIIIIIIIIIIIII</td><td>0.2887</td><td>|IIIIIIIII</td></tr>
<tr><td>2 2</td><td>1</td><td>0.7483</td><td>0.5774</td><td>|IIIIIIIIIIIIIIIII</td><td>0.4361</td><td>|IIIIIIIIIIIII</td></tr>
<tr><td>29 41</td><td>1</td><td>0.7238</td><td>0.5444</td><td>|IIIIIIIIIIIIIIII</td><td>0.3969</td><td>|IIIIIIIIIIII</td></tr>
<tr><td>10 13</td><td>1</td><td>0.7163</td><td>0.5335</td><td>|IIIIIIIIIIIIIIII</td><td>0.4610</td><td>|IIIIIIIIIIIIII</td></tr>
<tr><td>59 87</td><td>1</td><td>0.6850</td><td>0.4966</td><td>|IIIIIIIIIIIIIII</td><td>0.3844</td><td>|IIIIIIIIIIII</td></tr>
<tr><td>119 164</td><td>1</td><td>0.5865</td><td>0.4192</td><td>|IIIIIIIIIIIII</td><td>0.0575</td><td>|II</td></tr>
<tr><td>48 72</td><td>1</td><td>0.5786</td><td>0.3808</td><td>|IIIIIIIIIII</td><td>0.4489</td><td>|IIIIIIIIIIIII</td></tr>
<tr><td>7 10</td><td>1</td><td>0.5708</td><td>0.4121</td><td>|IIIIIIIIIIII</td><td>0.0262</td><td>|I</td></tr>
<tr><td>102 143</td><td>1</td><td>0.5539</td><td>0.3775</td><td>|IIIIIIIIIII</td><td>0.4809</td><td>|IIIIIIIIIIIIII</td></tr>
<tr><td>38 56</td><td>1</td><td>0.5397</td><td>0.3432</td><td>|IIIIIIIIII</td><td>0.4083</td><td>|IIIIIIIIIIII</td></tr>
<tr><td>34 49</td><td>1</td><td>0.4943</td><td>0.3272</td><td>|IIIIIIIIII</td><td>0.1618</td><td>|IIIII</td></tr>
<tr><td>123 172</td><td>1</td><td>0.4675</td><td>0.2997</td><td>|IIIIIIIII</td><td>0.2175</td><td>|IIIIIII</td></tr>
<tr><td>79 117</td><td>1</td><td>0.4383</td><td>0.3604</td><td>|IIIIIIIIIII</td><td>-0.1466</td><td>|</td></tr>
<tr><td>92 132</td><td>1</td><td>0.4237</td><td>0.3472</td><td>|IIIIIIIIII</td><td>-0.1575</td><td>|</td></tr>
<tr><td>19 29</td><td>1</td><td>0.3715</td><td>0.2675</td><td>|IIIIIIII</td><td>0.2557</td><td>|IIIIIIII</td></tr>
<tr><td>107 149</td><td>2</td><td>0.8845</td><td>0.7899</td><td>|IIIIIIIIIIIIIIIIIIIIIIII</td><td>0.5410</td><td>|IIIIIIIIIIIIIIII</td></tr>
<tr><td>37 55</td><td>2</td><td>0.8835</td><td>0.7862</td><td>|IIIIIIIIIIIIIIIIIIIIIIII</td><td>0.5986</td><td>|IIIIIIIIIIIIIIIIII</td></tr>
<tr><td>109 151</td><td>2</td><td>0.8736</td><td>0.7693</td><td>|IIIIIIIIIIIIIIIIIIIIIII</td><td>0.6099</td><td>|IIIIIIIIIIIIIIIIII</td></tr>
<tr><td>65 95</td><td>2</td><td>0.8627</td><td>0.7515</td><td>|IIIIIIIIIIIIIIIIIIIIIII</td><td>0.6084</td><td>|IIIIIIIIIIIIIIIIII</td></tr>
<tr><td>22 34</td><td>2</td><td>0.8525</td><td>0.7398</td><td>|IIIIIIIIIIIIIIIIIIIIII</td><td>0.5008</td><td>|IIIIIIIIIIIIIII</td></tr>
<tr><td>99 140</td><td>2</td><td>0.8317</td><td>0.7087</td><td>|IIIIIIIIIIIIIIIIIIIII</td><td>0.4809</td><td>|IIIIIIIIIIIIII</td></tr>
<tr><td>9 12</td><td>2</td><td>0.8269</td><td>0.6986</td><td>|IIIIIIIIIIIIIIIIIIIII</td><td>0.4969</td><td>|IIIIIIIIIIIIIII</td></tr>
<tr><td>49 73</td><td>2</td><td>0.8064</td><td>0.6666</td><td>|IIIIIIIIIIIIIIIIIIII</td><td>0.5577</td><td>|IIIIIIIIIIIIIIIII</td></tr>
<tr><td>95 135</td><td>2</td><td>0.7740</td><td>0.6247</td><td>|IIIIIIIIIIIIIIIIIII</td><td>0.4538</td><td>|IIIIIIIIIIIIII</td></tr>
<tr><td>108 150</td><td>2</td><td>0.7629</td><td>0.6021</td><td>|IIIIIIIIIIIIIIIIII</td><td>0.5624</td><td>|IIIIIIIIIIIIIIIII</td></tr>
<tr><td>4 4</td><td>2</td><td>0.7586</td><td>0.5980</td><td>|IIIIIIIIIIIIIIIIII</td><td>0.4889</td><td>|IIIIIIIIIIIIIII</td></tr>
</table>

**Membership Summary Section for Clusters = 6**

<table>
<tr><th>Row</th><th>Cluster</th><th>Cluster Membership</th><th>Sum of Squared Memberships</th><th>Bar of Squared Memberships</th><th>Silhouette Amount</th><th>Silhouette Bar</th></tr>
<tr><td>86 126</td><td>2</td><td>0.7552</td><td>0.6020</td><td>|||||||||||||||||||</td><td>0.4882</td><td>||||||||||||||||</td></tr>
<tr><td>39 58</td><td>2</td><td>0.7422</td><td>0.5842</td><td>|||||||||||||||||||</td><td>0.4879</td><td>||||||||||||||||</td></tr>
<tr><td>36 54</td><td>2</td><td>0.7368</td><td>0.5757</td><td>||||||||||||||||||</td><td>0.4933</td><td>||||||||||||||||</td></tr>
<tr><td>67 98</td><td>2</td><td>0.7351</td><td>0.5861</td><td>|||||||||||||||||||</td><td>0.4299</td><td>||||||||||||||</td></tr>
<tr><td>105 147</td><td>2</td><td>0.7043</td><td>0.5444</td><td>|||||||||||||||||</td><td>0.4089</td><td>|||||||||||||</td></tr>
<tr><td>98 139</td><td>2</td><td>0.6680</td><td>0.4876</td><td>||||||||||||||||</td><td>0.4404</td><td>||||||||||||||</td></tr>
<tr><td>76 113</td><td>2</td><td>0.6456</td><td>0.4674</td><td>|||||||||||||||</td><td>0.3778</td><td>||||||||||||</td></tr>
<tr><td>71 103</td><td>2</td><td>0.6329</td><td>0.4908</td><td>||||||||||||||||</td><td>0.3232</td><td>|||||||||||</td></tr>
<tr><td>32 46</td><td>2</td><td>0.5959</td><td>0.4484</td><td>||||||||||||||</td><td>0.3413</td><td>|||||||||||</td></tr>
<tr><td>55 83</td><td>2</td><td>0.5723</td><td>0.4659</td><td>|||||||||||||||</td><td>0.2762</td><td>|||||||||</td></tr>
<tr><td>30 42</td><td>2</td><td>0.4651</td><td>0.3668</td><td>||||||||||||</td><td>0.1817</td><td>||||||</td></tr>
<tr><td>77 114</td><td>2</td><td>0.4542</td><td>0.3380</td><td>|||||||||||</td><td>0.2047</td><td>|||||||</td></tr>
<tr><td>28 40</td><td>2</td><td>0.4049</td><td>0.3305</td><td>|||||||||||</td><td>0.1222</td><td>|||||</td></tr>
<tr><td>51 75</td><td>2</td><td>0.3800</td><td>0.2973</td><td>||||||||||</td><td>0.1778</td><td>||||||</td></tr>
<tr><td>31 43</td><td>3</td><td>0.9015</td><td>0.8154</td><td>|||||||||||||||||||||||||</td><td>0.2138</td><td>|||||||</td></tr>
<tr><td>73 105</td><td>3</td><td>0.8480</td><td>0.7245</td><td>|||||||||||||||||||||||</td><td>0.3630</td><td>||||||||||||</td></tr>
<tr><td>120 165</td><td>3</td><td>0.7982</td><td>0.6477</td><td>||||||||||||||||||||</td><td>0.2035</td><td>|||||||</td></tr>
<tr><td>88 128</td><td>3</td><td>0.7693</td><td>0.6044</td><td>|||||||||||||||||||</td><td>0.2977</td><td>||||||||||</td></tr>
<tr><td>60 89</td><td>3</td><td>0.7498</td><td>0.5778</td><td>||||||||||||||||||</td><td>0.1930</td><td>|||||||</td></tr>
<tr><td>81 120</td><td>3</td><td>0.7472</td><td>0.5815</td><td>||||||||||||||||||</td><td>-0.1377</td><td>|</td></tr>
<tr><td>70 102</td><td>3</td><td>0.6718</td><td>0.4806</td><td>|||||||||||||||</td><td>0.0136</td><td>|</td></tr>
<tr><td>114 156</td><td>3</td><td>0.6582</td><td>0.4728</td><td>|||||||||||||||</td><td>-0.1842</td><td>|</td></tr>
<tr><td>103 144</td><td>3</td><td>0.5796</td><td>0.3749</td><td>||||||||||||</td><td>0.3034</td><td>||||||||||</td></tr>
<tr><td>52 77</td><td>3</td><td>0.4447</td><td>0.2757</td><td>|||||||||</td><td>-0.1616</td><td>|</td></tr>
<tr><td>63 92</td><td>3</td><td>0.3400</td><td>0.2149</td><td>|||||||</td><td>0.0124</td><td>|</td></tr>
<tr><td>50 74</td><td>3</td><td>0.3398</td><td>0.2060</td><td>|||||||</td><td>0.1835</td><td>|||||||</td></tr>
<tr><td>40 60</td><td>4</td><td>0.8656</td><td>0.7573</td><td>||||||||||||||||||||||||</td><td>0.3633</td><td>||||||||||||</td></tr>
<tr><td>3 3</td><td>4</td><td>0.8443</td><td>0.7242</td><td>|||||||||||||||||||||||</td><td>0.3100</td><td>||||||||||</td></tr>
<tr><td>16 22</td><td>4</td><td>0.8152</td><td>0.6829</td><td>|||||||||||||||||||||</td><td>0.2141</td><td>|||||||</td></tr>
<tr><td>118 163</td><td>4</td><td>0.8095</td><td>0.6664</td><td>|||||||||||||||||||||</td><td>0.4267</td><td>||||||||||||||</td></tr>
<tr><td>121 168</td><td>4</td><td>0.7852</td><td>0.6351</td><td>||||||||||||||||||||</td><td>0.3399</td><td>|||||||||||</td></tr>
<tr><td>26 38</td><td>4</td><td>0.7717</td><td>0.6294</td><td>||||||||||||||||||||</td><td>0.0849</td><td>||||</td></tr>
<tr><td>58 86</td><td>4</td><td>0.7628</td><td>0.6003</td><td>|||||||||||||||||||</td><td>0.3403</td><td>|||||||||||</td></tr>
<tr><td>44 65</td><td>4</td><td>0.7601</td><td>0.5965</td><td>|||||||||||||||||||</td><td>0.3290</td><td>|||||||||||</td></tr>
<tr><td>122 171</td><td>4</td><td>0.7135</td><td>0.5595</td><td>||||||||||||||||||</td><td>0.0628</td><td>|||</td></tr>
<tr><td>66 97</td><td>4</td><td>0.7105</td><td>0.5307</td><td>|||||||||||||||||</td><td>0.3007</td><td>||||||||||</td></tr>
<tr><td>27 39</td><td>4</td><td>0.6772</td><td>0.4868</td><td>||||||||||||||||</td><td>0.3493</td><td>|||||||||||</td></tr>
<tr><td>35 52</td><td>4</td><td>0.6366</td><td>0.4801</td><td>|||||||||||||||</td><td>0.0056</td><td>|</td></tr>
<tr><td>14 20</td><td>4</td><td>0.6275</td><td>0.4812</td><td>|||||||||||||||</td><td>-0.0213</td><td>|</td></tr>
<tr><td>89 129</td><td>4</td><td>0.5189</td><td>0.3581</td><td>||||||||||||</td><td>0.0996</td><td>||||</td></tr>
<tr><td>53 80</td><td>4</td><td>0.4931</td><td>0.3180</td><td>|||||||||||</td><td>0.1944</td><td>|||||||</td></tr>
<tr><td>56 84</td><td>4</td><td>0.4780</td><td>0.2862</td><td>||||||||||</td><td>0.3579</td><td>||||||||||||</td></tr>
</table>

**Membership Summary Section for Clusters = 6**

<table>
<tr><th>Row</th><th>Cluster</th><th>Cluster Membership</th><th>Sum of Squared Memberships</th><th>Bar of Squared Memberships</th><th>Silhouette Amount</th><th>Silhouette Bar</th></tr>
<tr><td>25 37</td><td>4</td><td>0.4467</td><td>0.3362</td><td>|IIIIIIIIII</td><td>-0.0957</td><td>|</td></tr>
<tr><td>12 15</td><td>4</td><td>0.4036</td><td>0.2852</td><td>|IIIIIIIII</td><td>0.0207</td><td>|I</td></tr>
<tr><td>84 124</td><td>4</td><td>0.3054</td><td>0.2071</td><td>|IIIIII</td><td>0.0516</td><td>|II</td></tr>
<tr><td>5 6</td><td>5</td><td>0.9575</td><td>0.9171</td><td>|IIIIIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.7224</td><td>|IIIIIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>61 90</td><td>5</td><td>0.9547</td><td>0.9119</td><td>|IIIIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.7230</td><td>|IIIIIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>17 26</td><td>5</td><td>0.9536</td><td>0.9098</td><td>|IIIIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.7135</td><td>|IIIIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>20 31</td><td>5</td><td>0.9490</td><td>0.9012</td><td>|IIIIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.7062</td><td>|IIIIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>111 153</td><td>5</td><td>0.9442</td><td>0.8923</td><td>|IIIIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.7291</td><td>|IIIIIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>43 64</td><td>5</td><td>0.9344</td><td>0.8743</td><td>|IIIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.7168</td><td>|IIIIIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>82 121</td><td>5</td><td>0.9241</td><td>0.8554</td><td>|IIIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.7235</td><td>|IIIIIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>93 133</td><td>5</td><td>0.9122</td><td>0.8343</td><td>|IIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.7009</td><td>|IIIIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>110 152</td><td>5</td><td>0.9077</td><td>0.8257</td><td>|IIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.6868</td><td>|IIIIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>106 148</td><td>5</td><td>0.9061</td><td>0.8238</td><td>|IIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.7061</td><td>|IIIIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>72 104</td><td>5</td><td>0.8835</td><td>0.7835</td><td>|IIIIIIIIIIIIIIIIIIIIIIII</td><td>0.6603</td><td>|IIIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>15 21</td><td>5</td><td>0.8787</td><td>0.7752</td><td>|IIIIIIIIIIIIIIIIIIIIIII</td><td>0.6593</td><td>|IIIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>57 85</td><td>5</td><td>0.8662</td><td>0.7550</td><td>|IIIIIIIIIIIIIIIIIIIIIII</td><td>0.7024</td><td>|IIIIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>83 122</td><td>5</td><td>0.8302</td><td>0.6952</td><td>|IIIIIIIIIIIIIIIIIIIII</td><td>0.6456</td><td>|IIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>13 19</td><td>5</td><td>0.8089</td><td>0.6648</td><td>|IIIIIIIIIIIIIIIIIIII</td><td>0.6100</td><td>|IIIIIIIIIIIIIIIIII</td></tr>
<tr><td>97 138</td><td>5</td><td>0.8041</td><td>0.6543</td><td>|IIIIIIIIIIIIIIIIIIII</td><td>0.6411</td><td>|IIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>116 159</td><td>5</td><td>0.7948</td><td>0.6440</td><td>|IIIIIIIIIIIIIIIIIII</td><td>0.6250</td><td>|IIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>75 110</td><td>5</td><td>0.7894</td><td>0.6351</td><td>|IIIIIIIIIIIIIIIIIII</td><td>0.6381</td><td>|IIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>80 118</td><td>5</td><td>0.7807</td><td>0.6270</td><td>|IIIIIIIIIIIIIIIIIII</td><td>0.6301</td><td>|IIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>113 155</td><td>5</td><td>0.7775</td><td>0.6145</td><td>|IIIIIIIIIIIIIIIIII</td><td>0.6364</td><td>|IIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>45 67</td><td>5</td><td>0.7730</td><td>0.6081</td><td>|IIIIIIIIIIIIIIIIII</td><td>0.6188</td><td>|IIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>21 32</td><td>5</td><td>0.7643</td><td>0.6025</td><td>|IIIIIIIIIIIIIIIIII</td><td>0.6062</td><td>|IIIIIIIIIIIIIIIIII</td></tr>
<tr><td>85 125</td><td>5</td><td>0.7317</td><td>0.5501</td><td>|IIIIIIIIIIIIIIIII</td><td>0.5903</td><td>|IIIIIIIIIIIIIIIIII</td></tr>
<tr><td>112 154</td><td>5</td><td>0.7247</td><td>0.5544</td><td>|IIIIIIIIIIIIIIIII</td><td>0.6031</td><td>|IIIIIIIIIIIIIIIIII</td></tr>
<tr><td>54 82</td><td>5</td><td>0.7172</td><td>0.5387</td><td>|IIIIIIIIIIIIIIII</td><td>0.5823</td><td>|IIIIIIIIIIIIIIIII</td></tr>
<tr><td>47 71</td><td>5</td><td>0.7090</td><td>0.5198</td><td>|IIIIIIIIIIIIIIII</td><td>0.6094</td><td>|IIIIIIIIIIIIIIIIII</td></tr>
<tr><td>96 136</td><td>5</td><td>0.6856</td><td>0.4909</td><td>|IIIIIIIIIIIIIII</td><td>0.6262</td><td>|IIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>69 101</td><td>5</td><td>0.6389</td><td>0.4406</td><td>|IIIIIIIIIIIII</td><td>0.6049</td><td>|IIIIIIIIIIIIIIIIII</td></tr>
<tr><td>87 127</td><td>5</td><td>0.5545</td><td>0.3702</td><td>|IIIIIIIIIII</td><td>0.4834</td><td>|IIIIIIIIIIIIIII</td></tr>
<tr><td>23 35</td><td>5</td><td>0.4646</td><td>0.2764</td><td>|IIIIIIII</td><td>0.3830</td><td>|IIIIIIIIIII</td></tr>
<tr><td>91 131</td><td>5</td><td>0.3782</td><td>0.2291</td><td>|IIIIIII</td><td>0.4079</td><td>|IIIIIIIIIIII</td></tr>
<tr><td>62 91</td><td>6</td><td>0.8711</td><td>0.7641</td><td>|IIIIIIIIIIIIIIIIIIIIIII</td><td>-0.3094</td><td>|</td></tr>
<tr><td>90 130</td><td>6</td><td>0.8551</td><td>0.7367</td><td>|IIIIIIIIIIIIIIIIIIIIII</td><td>-0.0844</td><td>|</td></tr>
<tr><td>8 11</td><td>6</td><td>0.8084</td><td>0.6668</td><td>|IIIIIIIIIIIIIIIIIIII</td><td>-0.4080</td><td>|</td></tr>
<tr><td>104 146</td><td>6</td><td>0.7614</td><td>0.5959</td><td>|IIIIIIIIIIIIIIIIII</td><td>-0.3813</td><td>|</td></tr>
<tr><td>100 141</td><td>6</td><td>0.7549</td><td>0.5926</td><td>|IIIIIIIIIIIIIIIIII</td><td>-0.4492</td><td>|</td></tr>
<tr><td>101 142</td><td>6</td><td>0.6498</td><td>0.4473</td><td>|IIIIIIIIIIIII</td><td>0.1111</td><td>|III</td></tr>
<tr><td>41 61</td><td>6</td><td>0.6166</td><td>0.4126</td><td>|IIIIIIIIIIII</td><td>0.1372</td><td>|IIII</td></tr>
<tr><td>24 36</td><td>6</td><td>0.6106</td><td>0.4046</td><td>|IIIIIIIIIIII</td><td>-0.1479</td><td>|</td></tr>
</table>

**Membership Summary Section for Clusters = 6**

| Row | Cluster | Cluster Membership | Sum of Squared Memberships | Bar of Squared Memberships | Silhouette Amount | Silhouette Bar |
|---|---|---|---|---|---|---|
| 42 63 | 6 | 0.5594 | 0.3525 | \|\|\|\|\|\|\|\|\|\|\|\| | 0.1322 | \|\|\|\| |
| 117 161 | 6 | 0.5563 | 0.3732 | \|\|\|\|\|\|\|\|\|\|\|\| | -0.3735 | \| |
| 94 134 | 6 | 0.3448 | 0.2086 | \|\|\|\|\|\|\| | 0.1526 | \|\|\|\|\| |
| 18 27 | 6 | 0.2248 | 0.1712 | \|\|\|\|\|\| | 0.1489 | \|\|\|\| |

**Membership Matrix Section**

| Row | Cluster | Prob in 1 | Prob in 2 | Prob in 3 | Prob in 4 | Prob in 5 | Prob in 6 |
|---|---|---|---|---|---|---|---|
| 1 1 | 1 | 0.8344 | 0.0512 | 0.0064 | 0.0381 | 0.0118 | 0.0583 |
| 2 2 | 1 | 0.7483 | 0.0753 | 0.0090 | 0.0679 | 0.0166 | 0.0829 |
| 3 3 | 4 | 0.0207 | 0.1023 | 0.0104 | 0.8443 | 0.0127 | 0.0096 |
| 4 4 | 2 | 0.1204 | 0.7586 | 0.0066 | 0.0876 | 0.0130 | 0.0139 |
| 5 6 | 5 | 0.0068 | 0.0079 | 0.0134 | 0.0096 | 0.9575 | 0.0049 |
| 6 7 | 1 | 0.8996 | 0.0375 | 0.0042 | 0.0237 | 0.0090 | 0.0261 |
| 7 10 | 1 | 0.5708 | 0.2780 | 0.0107 | 0.0854 | 0.0236 | 0.0315 |
| 8 11 | 6 | 0.1058 | 0.0284 | 0.0104 | 0.0305 | 0.0165 | 0.8084 |
| 9 12 | 2 | 0.0415 | 0.8269 | 0.0036 | 0.1144 | 0.0065 | 0.0071 |
| 10 13 | 1 | 0.7163 | 0.0989 | 0.0157 | 0.0600 | 0.0332 | 0.0760 |
| 11 14 | 1 | 0.8212 | 0.0467 | 0.0076 | 0.0354 | 0.0159 | 0.0733 |
| 12 15 | 4 | 0.2463 | 0.2374 | 0.0180 | 0.4036 | 0.0325 | 0.0622 |
| 13 19 | 5 | 0.0208 | 0.0283 | 0.0855 | 0.0405 | 0.8089 | 0.0160 |
| 14 20 | 4 | 0.0446 | 0.2915 | 0.0091 | 0.6275 | 0.0121 | 0.0152 |
| 15 21 | 5 | 0.0231 | 0.0259 | 0.0300 | 0.0280 | 0.8787 | 0.0144 |
| 16 22 | 4 | 0.0277 | 0.1318 | 0.0063 | 0.8152 | 0.0086 | 0.0104 |
| 17 26 | 5 | 0.0072 | 0.0082 | 0.0151 | 0.0106 | 0.9536 | 0.0054 |
| 18 27 | 6 | 0.1581 | 0.1406 | 0.1720 | 0.1519 | 0.1526 | 0.2248 |
| 19 29 | 1 | 0.3715 | 0.1094 | 0.0239 | 0.1502 | 0.0404 | 0.3046 |
| 20 31 | 5 | 0.0076 | 0.0091 | 0.0170 | 0.0117 | 0.9490 | 0.0056 |
| 21 32 | 5 | 0.0227 | 0.0284 | 0.1214 | 0.0429 | 0.7643 | 0.0203 |
| 22 34 | 2 | 0.0233 | 0.8525 | 0.0030 | 0.1113 | 0.0049 | 0.0050 |
| 23 35 | 5 | 0.1540 | 0.0990 | 0.0791 | 0.0947 | 0.4646 | 0.1086 |
| 24 36 | 6 | 0.0994 | 0.0608 | 0.0612 | 0.0952 | 0.0728 | 0.6106 |
| 25 37 | 4 | 0.1528 | 0.3341 | 0.0121 | 0.4467 | 0.0189 | 0.0354 |
| 26 38 | 4 | 0.0223 | 0.1821 | 0.0066 | 0.7717 | 0.0091 | 0.0082 |
| 27 39 | 4 | 0.0811 | 0.1310 | 0.0256 | 0.6772 | 0.0336 | 0.0515 |
| 28 40 | 2 | 0.3874 | 0.4049 | 0.0171 | 0.1154 | 0.0342 | 0.0410 |
| 29 41 | 1 | 0.7238 | 0.0884 | 0.0105 | 0.0815 | 0.0220 | 0.0739 |
| 30 42 | 2 | 0.3724 | 0.4651 | 0.0107 | 0.1020 | 0.0219 | 0.0278 |
| 31 43 | 3 | 0.0101 | 0.0130 | 0.9015 | 0.0198 | 0.0442 | 0.0113 |
| 32 46 | 2 | 0.0508 | 0.5959 | 0.0157 | 0.2996 | 0.0210 | 0.0171 |
| 33 47 | 1 | 0.7949 | 0.0741 | 0.0097 | 0.0449 | 0.0191 | 0.0574 |
| 34 49 | 1 | 0.4943 | 0.1870 | 0.0145 | 0.2037 | 0.0266 | 0.0739 |
| 35 52 | 4 | 0.0597 | 0.2660 | 0.0082 | 0.6366 | 0.0125 | 0.0170 |

**Membership Matrix Section**

| Row | Cluster | Prob in 1 | Prob in 2 | Prob in 3 | Prob in 4 | Prob in 5 | Prob in 6 |
|---|---|---|---|---|---|---|---|
| 36 54 | 2 | 0.0483 | 0.7368 | 0.0114 | 0.1730 | 0.0167 | 0.0138 |
| 37 55 | 2 | 0.0342 | 0.8835 | 0.0037 | 0.0654 | 0.0071 | 0.0060 |
| 38 56 | 1 | 0.5397 | 0.1273 | 0.0307 | 0.0887 | 0.0618 | 0.1518 |
| 39 58 | 2 | 0.0435 | 0.7422 | 0.0104 | 0.1762 | 0.0152 | 0.0126 |
| 40 60 | 4 | 0.0205 | 0.0854 | 0.0086 | 0.8656 | 0.0099 | 0.0100 |
| 41 61 | 6 | 0.1225 | 0.0694 | 0.0525 | 0.0794 | 0.0596 | 0.6166 |
| 42 63 | 6 | 0.0985 | 0.0712 | 0.0925 | 0.1030 | 0.0755 | 0.5594 |
| 43 64 | 5 | 0.0080 | 0.0093 | 0.0290 | 0.0125 | 0.9344 | 0.0068 |
| 44 65 | 4 | 0.0543 | 0.1198 | 0.0159 | 0.7601 | 0.0233 | 0.0266 |
| 45 67 | 5 | 0.0530 | 0.0475 | 0.0451 | 0.0481 | 0.7730 | 0.0333 |
| 46 68 | 1 | 0.8240 | 0.0736 | 0.0056 | 0.0517 | 0.0110 | 0.0341 |
| 47 71 | 5 | 0.0608 | 0.0462 | 0.0679 | 0.0556 | 0.7090 | 0.0605 |
| 48 72 | 1 | 0.5786 | 0.1099 | 0.0257 | 0.0783 | 0.0509 | 0.1566 |
| 49 73 | 2 | 0.0429 | 0.8064 | 0.0082 | 0.1185 | 0.0132 | 0.0107 |
| 50 74 | 3 | 0.1040 | 0.1381 | 0.3398 | 0.1643 | 0.1539 | 0.0998 |
| 51 75 | 2 | 0.2639 | 0.3800 | 0.0118 | 0.2848 | 0.0197 | 0.0398 |
| 52 77 | 3 | 0.0650 | 0.0602 | 0.4447 | 0.0902 | 0.2156 | 0.1243 |
| 53 80 | 4 | 0.1795 | 0.1837 | 0.0237 | 0.4931 | 0.0366 | 0.0834 |
| 54 82 | 5 | 0.0293 | 0.0420 | 0.1345 | 0.0553 | 0.7172 | 0.0216 |
| 55 83 | 2 | 0.0342 | 0.5723 | 0.0056 | 0.3702 | 0.0090 | 0.0088 |
| 56 84 | 4 | 0.0810 | 0.1378 | 0.1324 | 0.4780 | 0.0887 | 0.0821 |
| 57 85 | 5 | 0.0181 | 0.0178 | 0.0561 | 0.0237 | 0.8662 | 0.0181 |
| 58 86 | 4 | 0.0355 | 0.1220 | 0.0273 | 0.7628 | 0.0332 | 0.0192 |
| 59 87 | 1 | 0.6850 | 0.1297 | 0.0165 | 0.0695 | 0.0345 | 0.0647 |
| 60 89 | 3 | 0.0275 | 0.0424 | 0.7498 | 0.0634 | 0.0916 | 0.0253 |
| 61 90 | 5 | 0.0073 | 0.0084 | 0.0143 | 0.0101 | 0.9547 | 0.0052 |
| 62 91 | 6 | 0.0636 | 0.0206 | 0.0085 | 0.0235 | 0.0127 | 0.8711 |
| 63 92 | 3 | 0.0914 | 0.0804 | 0.3400 | 0.1105 | 0.1671 | 0.2106 |
| 64 93 | 1 | 0.7653 | 0.1031 | 0.0109 | 0.0525 | 0.0233 | 0.0450 |
| 65 95 | 2 | 0.0441 | 0.8627 | 0.0047 | 0.0723 | 0.0083 | 0.0080 |
| 66 97 | 4 | 0.0438 | 0.1415 | 0.0345 | 0.7105 | 0.0463 | 0.0233 |
| 67 98 | 2 | 0.0293 | 0.7351 | 0.0064 | 0.2112 | 0.0097 | 0.0082 |
| 68 99 | 1 | 0.7647 | 0.1216 | 0.0064 | 0.0639 | 0.0121 | 0.0313 |
| 69 101 | 5 | 0.0516 | 0.0445 | 0.1423 | 0.0581 | 0.6389 | 0.0647 |
| 70 102 | 3 | 0.0331 | 0.0529 | 0.6718 | 0.0777 | 0.1361 | 0.0283 |
| 71 103 | 2 | 0.0448 | 0.6329 | 0.0057 | 0.2967 | 0.0099 | 0.0100 |
| 72 104 | 5 | 0.0198 | 0.0242 | 0.0327 | 0.0272 | 0.8835 | 0.0126 |
| 73 105 | 3 | 0.0183 | 0.0236 | 0.8480 | 0.0354 | 0.0527 | 0.0219 |
| 74 107 | 1 | 0.8085 | 0.0966 | 0.0062 | 0.0486 | 0.0144 | 0.0257 |
| 75 110 | 5 | 0.0262 | 0.0270 | 0.0909 | 0.0393 | 0.7894 | 0.0271 |
| 76 113 | 2 | 0.1774 | 0.6456 | 0.0075 | 0.1361 | 0.0151 | 0.0183 |
| 77 114 | 2 | 0.0799 | 0.4542 | 0.0394 | 0.3471 | 0.0470 | 0.0325 |
| 78 115 | 1 | 0.8117 | 0.0798 | 0.0072 | 0.0500 | 0.0174 | 0.0340 |
| 79 117 | 1 | 0.4383 | 0.3923 | 0.0089 | 0.1149 | 0.0186 | 0.0270 |

**Membership Matrix Section**

| Row | Cluster | Prob in 1 | Prob in 2 | Prob in 3 | Prob in 4 | Prob in 5 | Prob in 6 |
|---|---|---|---|---|---|---|---|
| 80 118 | 5 | 0.0195 | 0.0250 | 0.1226 | 0.0354 | 0.7807 | 0.0168 |
| 81 120 | 3 | 0.0215 | 0.0252 | 0.7472 | 0.0391 | 0.1407 | 0.0264 |
| 82 121 | 5 | 0.0105 | 0.0109 | 0.0305 | 0.0144 | 0.9241 | 0.0096 |
| 83 122 | 5 | 0.0375 | 0.0356 | 0.0359 | 0.0371 | 0.8302 | 0.0237 |
| 84 124 | 4 | 0.1071 | 0.2398 | 0.1656 | 0.3054 | 0.1113 | 0.0708 |
| 85 125 | 5 | 0.0659 | 0.0554 | 0.0497 | 0.0556 | 0.7317 | 0.0417 |
| 86 126 | 2 | 0.0381 | 0.7552 | 0.0092 | 0.1729 | 0.0138 | 0.0109 |
| 87 127 | 5 | 0.0425 | 0.0657 | 0.2191 | 0.0876 | 0.5545 | 0.0306 |
| 88 128 | 3 | 0.0286 | 0.0320 | 0.7693 | 0.0463 | 0.0827 | 0.0410 |
| 89 129 | 4 | 0.0682 | 0.2796 | 0.0504 | 0.5189 | 0.0473 | 0.0356 |
| 90 130 | 6 | 0.0589 | 0.0244 | 0.0140 | 0.0283 | 0.0193 | 0.8551 |
| 91 131 | 5 | 0.1172 | 0.0773 | 0.1292 | 0.0978 | 0.3782 | 0.2003 |
| 92 132 | 1 | 0.4237 | 0.3929 | 0.0140 | 0.1047 | 0.0289 | 0.0358 |
| 93 133 | 5 | 0.0109 | 0.0135 | 0.0378 | 0.0172 | 0.9122 | 0.0084 |
| 94 134 | 6 | 0.1195 | 0.1006 | 0.1824 | 0.1348 | 0.1180 | 0.3448 |
| 95 135 | 2 | 0.0538 | 0.7740 | 0.0045 | 0.1503 | 0.0082 | 0.0091 |
| 96 136 | 5 | 0.0591 | 0.0475 | 0.0916 | 0.0550 | 0.6856 | 0.0611 |
| 97 138 | 5 | 0.0428 | 0.0354 | 0.0419 | 0.0418 | 0.8041 | 0.0340 |
| 98 139 | 2 | 0.1703 | 0.6680 | 0.0112 | 0.1063 | 0.0222 | 0.0220 |
| 99 140 | 2 | 0.0268 | 0.8317 | 0.0032 | 0.1274 | 0.0054 | 0.0056 |
| 100 141 | 6 | 0.1390 | 0.0364 | 0.0120 | 0.0392 | 0.0186 | 0.7549 |
| 101 142 | 6 | 0.0848 | 0.0546 | 0.0675 | 0.0775 | 0.0659 | 0.6498 |
| 102 143 | 1 | 0.5539 | 0.0830 | 0.0198 | 0.0668 | 0.0365 | 0.2400 |
| 103 144 | 3 | 0.0557 | 0.0814 | 0.5796 | 0.1114 | 0.1180 | 0.0538 |
| 104 146 | 6 | 0.1048 | 0.0388 | 0.0169 | 0.0524 | 0.0256 | 0.7614 |
| 105 147 | 2 | 0.0475 | 0.7043 | 0.0080 | 0.2138 | 0.0155 | 0.0109 |
| 106 148 | 5 | 0.0105 | 0.0122 | 0.0455 | 0.0165 | 0.9061 | 0.0092 |
| 107 149 | 2 | 0.0200 | 0.8845 | 0.0027 | 0.0841 | 0.0045 | 0.0042 |
| 108 150 | 2 | 0.0721 | 0.7629 | 0.0111 | 0.1192 | 0.0188 | 0.0159 |
| 109 151 | 2 | 0.0447 | 0.8736 | 0.0040 | 0.0631 | 0.0076 | 0.0070 |
| 110 152 | 5 | 0.0179 | 0.0190 | 0.0228 | 0.0209 | 0.9077 | 0.0117 |
| 111 153 | 5 | 0.0099 | 0.0104 | 0.0164 | 0.0120 | 0.9442 | 0.0071 |
| 112 154 | 5 | 0.0246 | 0.0268 | 0.1604 | 0.0379 | 0.7247 | 0.0256 |
| 113 155 | 5 | 0.0495 | 0.0392 | 0.0487 | 0.0443 | 0.7775 | 0.0408 |
| 114 156 | 3 | 0.0283 | 0.0431 | 0.6582 | 0.0667 | 0.1787 | 0.0251 |
| 115 158 | 1 | 0.8334 | 0.0461 | 0.0064 | 0.0372 | 0.0125 | 0.0644 |
| 116 159 | 5 | 0.0227 | 0.0312 | 0.0938 | 0.0406 | 0.7948 | 0.0168 |
| 117 161 | 6 | 0.2254 | 0.0704 | 0.0304 | 0.0672 | 0.0503 | 0.5563 |
| 118 163 | 4 | 0.0357 | 0.0921 | 0.0194 | 0.8095 | 0.0210 | 0.0222 |
| 119 164 | 1 | 0.5865 | 0.2496 | 0.0083 | 0.1076 | 0.0157 | 0.0323 |
| 120 165 | 3 | 0.0229 | 0.0253 | 0.7982 | 0.0373 | 0.0834 | 0.0328 |
| 121 168 | 4 | 0.0333 | 0.1286 | 0.0173 | 0.7852 | 0.0179 | 0.0177 |
| 122 171 | 4 | 0.0280 | 0.2216 | 0.0112 | 0.7135 | 0.0148 | 0.0110 |
| 123 172 | 1 | 0.4675 | 0.1591 | 0.0197 | 0.2039 | 0.0389 | 0.1108 |

**Cluster Medoids Section**

| Variable | Cluster1 | Cluster2 | Cluster3 | Cluster4 | Cluster5 | Cluster6 |
|---|---|---|---|---|---|---|
| Factor1 | 2.8681 | -0.0853 | 0.4986 | 1.0327 | -0.882 | -0.8839 |
| Factor2 | -0.9995 | -0.4938 | -0.8558 | -0.14 | 0.9945 | -1.3572 |
| Factor3 | -2.2188 | 0.7214 | -0.3941 | 1.0032 | -0.6271 | -1.0036 |
| Row | 90 130 | 107 149 | 46 68 | 40 60 | 5 6 | 10 13 |

**Cluster Medoids Section**

| Variable | Cluster7 |
|---|---|
| Factor1 | 1.0082 |
| Factor2 | 2.2898 |
| Factor3 | 0.3485 |
| Row | 31 43 |

**Membership Summary Section for Clusters = 7**

| Row | Cluster | Cluster Membership | Sum of Squared Memberships | Bar of Squared Memberships | Silhouette Amount | Silhouette Bar |
|---|---|---|---|---|---|---|
| 90 130 | 1 | 0.8206 | 0.6803 | IIIIIIIIIIIIIIIIIIIII | -0.0774 | I |
| 62 91 | 1 | 0.7966 | 0.6449 | IIIIIIIIIIIIIIIIIIII | -0.2948 | I |
| 8 11 | 1 | 0.6864 | 0.4981 | IIIIIIIIIIIIIIII | -0.4079 | I |
| 104 146 | 1 | 0.6792 | 0.4861 | IIIIIIIIIIIIIIII | -0.4335 | I |
| 101 142 | 1 | 0.6704 | 0.4682 | IIIIIIIIIIIIIII | 0.0555 | III |
| 100 141 | 1 | 0.6140 | 0.4186 | IIIIIIIIIIIIII | -0.4386 | I |
| 24 36 | 1 | 0.6030 | 0.3919 | IIIIIIIIIIIII | -0.2330 | I |
| 41 61 | 1 | 0.5757 | 0.3651 | IIIIIIIIIIII | 0.1302 | IIIII |
| 42 63 | 1 | 0.5714 | 0.3579 | IIIIIIIIIIII | 0.0956 | IIII |
| 117 161 | 1 | 0.4079 | 0.2668 | IIIIIIIII | -0.4626 | I |
| 94 134 | 1 | 0.3379 | 0.1900 | IIIIIII | 0.1526 | IIIIII |
| 18 27 | 1 | 0.1986 | 0.1469 | IIIII | 0.1482 | IIIII |
| 107 149 | 2 | 0.8919 | 0.8000 | IIIIIIIIIIIIIIIIIIIIIIIII | 0.5743 | IIIIIIIIIIIIIIIIII |
| 37 55 | 2 | 0.8561 | 0.7393 | IIIIIIIIIIIIIIIIIIIIIII | 0.5559 | IIIIIIIIIIIIIIIIII |
| 22 34 | 2 | 0.8555 | 0.7403 | IIIIIIIIIIIIIIIIIIIIIII | 0.5350 | IIIIIIIIIIIIIIIII |
| 65 95 | 2 | 0.8366 | 0.7078 | IIIIIIIIIIIIIIIIIIIIII | 0.5643 | IIIIIIIIIIIIIIIIII |
| 99 140 | 2 | 0.8273 | 0.6965 | IIIIIIIIIIIIIIIIIIIIII | 0.5155 | IIIIIIIIIIIIIIII |
| 109 151 | 2 | 0.8271 | 0.6932 | IIIIIIIIIIIIIIIIIIIIII | 0.5218 | IIIIIIIIIIIIIIIII |
| 49 73 | 2 | 0.8181 | 0.6798 | IIIIIIIIIIIIIIIIIIIII | 0.5856 | IIIIIIIIIIIIIIIIIII |
| 86 126 | 2 | 0.7884 | 0.6394 | IIIIIIIIIIIIIIIIIIII | 0.5162 | IIIIIIIIIIIIIIII |
| 67 98 | 2 | 0.7783 | 0.6302 | IIIIIIIIIIIIIIIIIIII | 0.4587 | IIIIIIIIIIIIIII |
| 39 58 | 2 | 0.7707 | 0.6136 | IIIIIIIIIIIIIIIIIII | 0.5147 | IIIIIIIIIIIIIIII |
| 9 12 | 2 | 0.7648 | 0.6046 | IIIIIIIIIIIIIIIIIII | 0.4246 | IIIIIIIIIIIIII |
| 36 54 | 2 | 0.7590 | 0.5964 | IIIIIIIIIIIIIIIIIII | 0.5193 | IIIIIIIIIIIIIIIII |
| 108 150 | 2 | 0.7377 | 0.5627 | IIIIIIIIIIIIIIIIII | 0.5539 | IIIIIIIIIIIIIIIIII |
| 95 135 | 2 | 0.6930 | 0.5144 | IIIIIIIIIIIIIIII | 0.3609 | IIIIIIIIIIII |
| 105 147 | 2 | 0.6844 | 0.5070 | IIIIIIIIIIIIIIII | 0.4405 | IIIIIIIIIIIIII |
| 4 4 | 2 | 0.6250 | 0.4395 | IIIIIIIIIIIIII | 0.3266 | IIIIIIIIIII |

**Membership Summary Section for Clusters = 7**

<table>
<tr><th>Row</th><th>Cluster</th><th>Cluster Membership</th><th>Sum of Squared Memberships</th><th>Bar of Squared Memberships</th><th>Silhouette Amount</th><th>Silhouette Bar</th></tr>
<tr><td>32 46</td><td>2</td><td>0.6209</td><td>0.4504</td><td>|IIIIIIIIIIIIII</td><td>0.3557</td><td>|IIIIIIIIIII</td></tr>
<tr><td>71 103</td><td>2</td><td>0.6119</td><td>0.4416</td><td>|IIIIIIIIIIIII</td><td>0.3643</td><td>|IIIIIIIIIII</td></tr>
<tr><td>55 83</td><td>2</td><td>0.5929</td><td>0.4451</td><td>|IIIIIIIIIIIII</td><td>0.3123</td><td>|IIIIIIIII</td></tr>
<tr><td>98 139</td><td>2</td><td>0.5539</td><td>0.3655</td><td>|IIIIIIIIIII</td><td>0.3333</td><td>|IIIIIIIIII</td></tr>
<tr><td>77 114</td><td>2</td><td>0.4461</td><td>0.3089</td><td>|IIIIIIIII</td><td>0.1970</td><td>|IIIIII</td></tr>
<tr><td>76 113</td><td>2</td><td>0.4318</td><td>0.3368</td><td>|IIIIIIIIII</td><td>0.0666</td><td>|II</td></tr>
<tr><td>28 40</td><td>2</td><td>0.2911</td><td>0.2464</td><td>|IIIIIII</td><td>0.0678</td><td>|II</td></tr>
<tr><td>46 68</td><td>3</td><td>0.8016</td><td>0.6568</td><td>|IIIIIIIIIIIIIIIIIIII</td><td>0.4486</td><td>|IIIIIIIIIIIII</td></tr>
<tr><td>34 49</td><td>3</td><td>0.7777</td><td>0.6167</td><td>|IIIIIIIIIIIIIIIIIII</td><td>0.4929</td><td>|IIIIIIIIIIIIIII</td></tr>
<tr><td>29 41</td><td>3</td><td>0.7471</td><td>0.5770</td><td>|IIIIIIIIIIIIIIIII</td><td>0.4446</td><td>|IIIIIIIIIIIII</td></tr>
<tr><td>119 164</td><td>3</td><td>0.7127</td><td>0.5328</td><td>|IIIIIIIIIIIIIIII</td><td>0.3619</td><td>|IIIIIIIIIII</td></tr>
<tr><td>123 172</td><td>3</td><td>0.6964</td><td>0.5052</td><td>|IIIIIIIIIIIIIII</td><td>0.4865</td><td>|IIIIIIIIIIIIIII</td></tr>
<tr><td>68 99</td><td>3</td><td>0.6946</td><td>0.5162</td><td>|IIIIIIIIIIIIIII</td><td>0.3974</td><td>|IIIIIIIIIIII</td></tr>
<tr><td>2 2</td><td>3</td><td>0.6756</td><td>0.4919</td><td>|IIIIIIIIIIIIIII</td><td>0.3663</td><td>|IIIIIIIIIII</td></tr>
<tr><td>78 115</td><td>3</td><td>0.6129</td><td>0.4394</td><td>|IIIIIIIIIIIII</td><td>0.2995</td><td>|IIIIIIIII</td></tr>
<tr><td>74 107</td><td>3</td><td>0.6117</td><td>0.4387</td><td>|IIIIIIIIIIIII</td><td>0.3193</td><td>|IIIIIIIIII</td></tr>
<tr><td>79 117</td><td>3</td><td>0.5861</td><td>0.4021</td><td>|IIIIIIIIIIII</td><td>0.1875</td><td>|IIIIII</td></tr>
<tr><td>12 15</td><td>3</td><td>0.5553</td><td>0.3659</td><td>|IIIIIIIIIII</td><td>0.3360</td><td>|IIIIIIIIII</td></tr>
<tr><td>51 75</td><td>3</td><td>0.5514</td><td>0.3687</td><td>|IIIIIIIIIII</td><td>0.2186</td><td>|IIIIIII</td></tr>
<tr><td>115 158</td><td>3</td><td>0.4705</td><td>0.3691</td><td>|IIIIIIIIIII</td><td>0.0648</td><td>|II</td></tr>
<tr><td>19 29</td><td>3</td><td>0.4628</td><td>0.2833</td><td>|IIIIIIIII</td><td>0.3842</td><td>|IIIIIIIIIIII</td></tr>
<tr><td>7 10</td><td>3</td><td>0.4047</td><td>0.2894</td><td>|IIIIIIIII</td><td>0.1497</td><td>|IIII</td></tr>
<tr><td>53 80</td><td>3</td><td>0.3884</td><td>0.2710</td><td>|IIIIIIII</td><td>0.1615</td><td>|IIIII</td></tr>
<tr><td>25 37</td><td>3</td><td>0.3785</td><td>0.2796</td><td>|IIIIIIII</td><td>0.0991</td><td>|III</td></tr>
<tr><td>30 42</td><td>3</td><td>0.3569</td><td>0.2763</td><td>|IIIIIIII</td><td>-0.0624</td><td>|</td></tr>
<tr><td>92 132</td><td>3</td><td>0.2974</td><td>0.2540</td><td>|IIIIIIII</td><td>-0.0767</td><td>|</td></tr>
<tr><td>40 60</td><td>4</td><td>0.8764</td><td>0.7733</td><td>|IIIIIIIIIIIIIIIIIIIIIII</td><td>0.3949</td><td>|IIIIIIIIIIII</td></tr>
<tr><td>3 3</td><td>4</td><td>0.8671</td><td>0.7585</td><td>|IIIIIIIIIIIIIIIIIIIIIII</td><td>0.3533</td><td>|IIIIIIIIIII</td></tr>
<tr><td>118 163</td><td>4</td><td>0.7988</td><td>0.6481</td><td>|IIIIIIIIIIIIIIIIIII</td><td>0.4425</td><td>|IIIIIIIIIIIII</td></tr>
<tr><td>121 168</td><td>4</td><td>0.7950</td><td>0.6456</td><td>|IIIIIIIIIIIIIIIIIII</td><td>0.3823</td><td>|IIIIIIIIIII</td></tr>
<tr><td>58 86</td><td>4</td><td>0.7779</td><td>0.6183</td><td>|IIIIIIIIIIIIIIIIIII</td><td>0.3786</td><td>|IIIIIIIIIII</td></tr>
<tr><td>16 22</td><td>4</td><td>0.7626</td><td>0.6039</td><td>|IIIIIIIIIIIIIIIIII</td><td>0.1910</td><td>|IIIIII</td></tr>
<tr><td>26 38</td><td>4</td><td>0.7576</td><td>0.6056</td><td>|IIIIIIIIIIIIIIIIII</td><td>0.0949</td><td>|III</td></tr>
<tr><td>122 171</td><td>4</td><td>0.7134</td><td>0.5520</td><td>|IIIIIIIIIIIIIIIII</td><td>0.0925</td><td>|III</td></tr>
<tr><td>66 97</td><td>4</td><td>0.7132</td><td>0.5294</td><td>|IIIIIIIIIIIIIIII</td><td>0.3296</td><td>|IIIIIIIIII</td></tr>
<tr><td>44 65</td><td>4</td><td>0.6716</td><td>0.4810</td><td>|IIIIIIIIIIIIII</td><td>0.2751</td><td>|IIIIIIII</td></tr>
<tr><td>27 39</td><td>4</td><td>0.5710</td><td>0.3732</td><td>|IIIIIIIIIII</td><td>0.2130</td><td>|IIIIII</td></tr>
<tr><td>14 20</td><td>4</td><td>0.5580</td><td>0.4074</td><td>|IIIIIIIIIIII</td><td>-0.0468</td><td>|</td></tr>
<tr><td>35 52</td><td>4</td><td>0.5051</td><td>0.3516</td><td>|IIIIIIIIIII</td><td>-0.0705</td><td>|</td></tr>
<tr><td>89 129</td><td>4</td><td>0.5019</td><td>0.3325</td><td>|IIIIIIIIII</td><td>0.1463</td><td>|IIII</td></tr>
<tr><td>56 84</td><td>4</td><td>0.4563</td><td>0.2613</td><td>|IIIIIIII</td><td>0.3745</td><td>|IIIIIIIIIII</td></tr>
<tr><td>84 124</td><td>4</td><td>0.2838</td><td>0.1822</td><td>|IIIII</td><td>0.0831</td><td>|II</td></tr>
</table>

**Membership Summary Section for Clusters = 7**

| Row | Cluster | Cluster Membership | Sum of Squared Memberships | Bar of Squared Memberships | Silhouette Amount | Silhouette Bar |
|---|---|---|---|---|---|---|
| 5 6 | 5 | 0.9543 | 0.9111 | |IIIIIIIIIIIIIIIIIIIIIIIIIII | 0.7236 | |IIIIIIIIIIIIIIIIIIIIII |
| 61 90 | 5 | 0.9513 | 0.9055 | |IIIIIIIIIIIIIIIIIIIIIIIIIII | 0.7240 | |IIIIIIIIIIIIIIIIIIIIII |
| 17 26 | 5 | 0.9500 | 0.9030 | |IIIIIIIIIIIIIIIIIIIIIIIIIII | 0.7149 | |IIIIIIIIIIIIIIIIIIIII |
| 20 31 | 5 | 0.9460 | 0.8954 | |IIIIIIIIIIIIIIIIIIIIIIIIIII | 0.7069 | |IIIIIIIIIIIIIIIIIIIII |
| 111 153 | 5 | 0.9371 | 0.8789 | |IIIIIIIIIIIIIIIIIIIIIIIIII | 0.7257 | |IIIIIIIIIIIIIIIIIIIIII |
| 43 64 | 5 | 0.9320 | 0.8697 | |IIIIIIIIIIIIIIIIIIIIIIIIII | 0.7169 | |IIIIIIIIIIIIIIIIIIIIII |
| 82 121 | 5 | 0.9170 | 0.8424 | |IIIIIIIIIIIIIIIIIIIIIIIII | 0.7254 | |IIIIIIIIIIIIIIIIIIIIII |
| 93 133 | 5 | 0.9089 | 0.8279 | |IIIIIIIIIIIIIIIIIIIIIIIII | 0.6999 | |IIIIIIIIIIIIIIIIIIIII |
| 106 148 | 5 | 0.9028 | 0.8174 | |IIIIIIIIIIIIIIIIIIIIIIIII | 0.7058 | |IIIIIIIIIIIIIIIIIIIII |
| 110 152 | 5 | 0.8937 | 0.8006 | |IIIIIIIIIIIIIIIIIIIIIIII | 0.6852 | |IIIIIIIIIIIIIIIIIIIII |
| 72 104 | 5 | 0.8709 | 0.7615 | |IIIIIIIIIIIIIIIIIIIIIII | 0.6588 | |IIIIIIIIIIIIIIIIIIII |
| 15 21 | 5 | 0.8618 | 0.7461 | |IIIIIIIIIIIIIIIIIIIIII | 0.6583 | |IIIIIIIIIIIIIIIIIIII |
| 57 85 | 5 | 0.8524 | 0.7312 | |IIIIIIIIIIIIIIIIIIIIII | 0.7049 | |IIIIIIIIIIIIIIIIIIIII |
| 13 19 | 5 | 0.8002 | 0.6498 | |IIIIIIIIIIIIIIIIIII | 0.6066 | |IIIIIIIIIIIIIIIIII |
| 83 122 | 5 | 0.8002 | 0.6471 | |IIIIIIIIIIIIIIIIIII | 0.6342 | |IIIIIIIIIIIIIIIIIII |
| 116 159 | 5 | 0.7854 | 0.6280 | |IIIIIIIIIIIIIIIIIII | 0.6211 | |IIIIIIIIIIIIIIIIIII |
| 80 118 | 5 | 0.7745 | 0.6155 | |IIIIIIIIIIIIIIIIII | 0.6301 | |IIIIIIIIIIIIIIIIIII |
| 75 110 | 5 | 0.7712 | 0.6063 | |IIIIIIIIIIIIIIIIII | 0.6408 | |IIIIIIIIIIIIIIIIIII |
| 97 138 | 5 | 0.7682 | 0.5993 | |IIIIIIIIIIIIIIIIII | 0.6129 | |IIIIIIIIIIIIIIIIII |
| 21 32 | 5 | 0.7543 | 0.5856 | |IIIIIIIIIIIIIIIIII | 0.6042 | |IIIIIIIIIIIIIIIIII |
| 113 155 | 5 | 0.7374 | 0.5554 | |IIIIIIIIIIIIIIIII | 0.6165 | |IIIIIIIIIIIIIIIIII |
| 45 67 | 5 | 0.7337 | 0.5505 | |IIIIIIIIIIIIIIIII | 0.6019 | |IIIIIIIIIIIIIIIIII |
| 112 154 | 5 | 0.7124 | 0.5343 | |IIIIIIIIIIIIIIII | 0.6031 | |IIIIIIIIIIIIIIIIII |
| 54 82 | 5 | 0.7047 | 0.5187 | |IIIIIIIIIIIIIIII | 0.5766 | |IIIIIIIIIIIIIIIII |
| 85 125 | 5 | 0.6857 | 0.4872 | |IIIIIIIIIIIIIII | 0.5734 | |IIIIIIIIIIIIIIIII |
| 47 71 | 5 | 0.6642 | 0.4604 | |IIIIIIIIIIIIII | 0.5857 | |IIIIIIIIIIIIIIIIII |
| 96 136 | 5 | 0.6444 | 0.4374 | |IIIIIIIIIIIII | 0.6113 | |IIIIIIIIIIIIIIIIII |
| 69 101 | 5 | 0.6051 | 0.3979 | |IIIIIIIIIIII | 0.6049 | |IIIIIIIIIIIIIIIIII |
| 87 127 | 5 | 0.5372 | 0.3454 | |IIIIIIIIII | 0.4729 | |IIIIIIIIIIIIII |
| 23 35 | 5 | 0.4043 | 0.2269 | |IIIIIII | 0.3926 | |IIIIIIIIIIII |
| 91 131 | 5 | 0.3351 | 0.1944 | |IIIIII | 0.3817 | |IIIIIIIIIII |
| 10 13 | 6 | 0.8558 | 0.7385 | |IIIIIIIIIIIIIIIIIIIIII | 0.5401 | |IIIIIIIIIIIIIIII |
| 33 47 | 6 | 0.8531 | 0.7355 | |IIIIIIIIIIIIIIIIIIIIII | 0.4697 | |IIIIIIIIIIIIII |
| 64 93 | 6 | 0.8014 | 0.6563 | |IIIIIIIIIIIIIIIIIIII | 0.3636 | |IIIIIIIIIII |
| 59 87 | 6 | 0.7876 | 0.6338 | |IIIIIIIIIIIIIIIIIII | 0.4413 | |IIIIIIIIIIIII |
| 48 72 | 6 | 0.7388 | 0.5625 | |IIIIIIIIIIIIIIIII | 0.5383 | |IIIIIIIIIIIIIIII |
| 38 56 | 6 | 0.6885 | 0.4965 | |IIIIIIIIIIIIIII | 0.5096 | |IIIIIIIIIIIIIII |
| 11 14 | 6 | 0.6432 | 0.4702 | |IIIIIIIIIIIIII | 0.1930 | |IIIIII |
| 102 143 | 6 | 0.6308 | 0.4353 | |IIIIIIIIIIIII | 0.4124 | |IIIIIIIIIIII |
| 6 7 | 6 | 0.6135 | 0.4617 | |IIIIIIIIIIIIII | 0.0387 | |I |
| 1 1 | 6 | 0.4682 | 0.3719 | |IIIIIIIIIII | -0.0713 | | |
| 31 43 | 7 | 0.9007 | 0.8135 | |IIIIIIIIIIIIIIIIIIIIIIII | 0.2138 | |IIIIII |

**Membership Summary Section for Clusters = 7**

<table>
<tr><th>Row</th><th>Cluster</th><th>Cluster Membership</th><th>Sum of Squared Memberships</th><th>Bar of Squared Memberships</th><th>Silhouette Amount</th><th>Silhouette Bar</th></tr>
<tr><td>73 105</td><td>7</td><td>0.8389</td><td>0.7089</td><td>||||||||||||||||||||||</td><td>0.3630</td><td>||||||||||||</td></tr>
<tr><td>120 165</td><td>7</td><td>0.7826</td><td>0.6228</td><td>||||||||||||||||||||</td><td>0.2035</td><td>|||||||</td></tr>
<tr><td>88 128</td><td>7</td><td>0.7500</td><td>0.5747</td><td>||||||||||||||||||</td><td>0.2977</td><td>||||||||||</td></tr>
<tr><td>81 120</td><td>7</td><td>0.7323</td><td>0.5585</td><td>||||||||||||||||||</td><td>-0.1377</td><td>|</td></tr>
<tr><td>60 89</td><td>7</td><td>0.7302</td><td>0.5485</td><td>|||||||||||||||||</td><td>0.1930</td><td>|||||||</td></tr>
<tr><td>70 102</td><td>7</td><td>0.6480</td><td>0.4484</td><td>||||||||||||||</td><td>0.0136</td><td>|</td></tr>
<tr><td>114 156</td><td>7</td><td>0.6373</td><td>0.4446</td><td>||||||||||||||</td><td>-0.1842</td><td>|</td></tr>
<tr><td>103 144</td><td>7</td><td>0.5443</td><td>0.3348</td><td>|||||||||||</td><td>0.2852</td><td>||||||||||</td></tr>
<tr><td>52 77</td><td>7</td><td>0.4052</td><td>0.2391</td><td>||||||||</td><td>-0.1616</td><td>|</td></tr>
<tr><td>50 74</td><td>7</td><td>0.3028</td><td>0.1762</td><td>||||||</td><td>0.1649</td><td>||||||</td></tr>
<tr><td>63 92</td><td>7</td><td>0.2984</td><td>0.1857</td><td>|||||||</td><td>0.0124</td><td>|</td></tr>
</table>

**Membership Matrix Section**

| Row | Cluster | Prob in 1 | Prob in 2 | Prob in 3 | Prob in 4 | Prob in 5 | Prob in 6 |
|---|---|---|---|---|---|---|---|
| 1 1 | 6 | 0.0490 | 0.0465 | 0.3831 | 0.0342 | 0.0124 | 0.4682 |
| 2 2 | 3 | 0.0485 | 0.0466 | 0.6756 | 0.0407 | 0.0119 | 0.1704 |
| 3 3 | 4 | 0.0062 | 0.0752 | 0.0264 | 0.8671 | 0.0088 | 0.0094 |
| 4 4 | 2 | 0.0128 | 0.6250 | 0.1934 | 0.0768 | 0.0135 | 0.0719 |
| 5 6 | 5 | 0.0044 | 0.0071 | 0.0077 | 0.0088 | 0.9543 | 0.0055 |
| 6 7 | 6 | 0.0244 | 0.0365 | 0.2875 | 0.0232 | 0.0103 | 0.6135 |
| 7 10 | 3 | 0.0232 | 0.1907 | 0.4047 | 0.0619 | 0.0200 | 0.2906 |
| 8 11 | 1 | 0.6864 | 0.0302 | 0.1005 | 0.0320 | 0.0189 | 0.1203 |
| 9 12 | 2 | 0.0067 | 0.7648 | 0.0994 | 0.0960 | 0.0068 | 0.0226 |
| 10 13 | 6 | 0.0188 | 0.0262 | 0.0689 | 0.0160 | 0.0098 | 0.8558 |
| 11 14 | 6 | 0.0488 | 0.0344 | 0.2281 | 0.0259 | 0.0133 | 0.6432 |
| 12 15 | 3 | 0.0342 | 0.1271 | 0.5553 | 0.1889 | 0.0201 | 0.0634 |
| 13 19 | 5 | 0.0148 | 0.0263 | 0.0253 | 0.0386 | 0.8002 | 0.0162 |
| 14 20 | 4 | 0.0135 | 0.2957 | 0.0866 | 0.5580 | 0.0116 | 0.0260 |
| 15 21 | 5 | 0.0133 | 0.0244 | 0.0260 | 0.0265 | 0.8618 | 0.0197 |
| 16 22 | 4 | 0.0097 | 0.1338 | 0.0626 | 0.7626 | 0.0087 | 0.0163 |
| 17 26 | 5 | 0.0049 | 0.0075 | 0.0084 | 0.0098 | 0.9500 | 0.0057 |
| 18 27 | 1 | 0.1986 | 0.1198 | 0.1371 | 0.1298 | 0.1309 | 0.1376 |
| 19 29 | 3 | 0.1874 | 0.0718 | 0.4628 | 0.0938 | 0.0295 | 0.1377 |
| 20 31 | 5 | 0.0050 | 0.0083 | 0.0088 | 0.0107 | 0.9460 | 0.0060 |
| 21 32 | 5 | 0.0192 | 0.0266 | 0.0280 | 0.0413 | 0.7543 | 0.0179 |
| 22 34 | 2 | 0.0039 | 0.8555 | 0.0415 | 0.0807 | 0.0043 | 0.0116 |
| 23 35 | 5 | 0.0914 | 0.0839 | 0.1294 | 0.0804 | 0.4043 | 0.1418 |
| 24 36 | 1 | 0.6030 | 0.0473 | 0.1018 | 0.0738 | 0.0591 | 0.0665 |
| 25 37 | 3 | 0.0259 | 0.2390 | 0.3785 | 0.2736 | 0.0155 | 0.0577 |
| 26 38 | 4 | 0.0065 | 0.1730 | 0.0376 | 0.7576 | 0.0078 | 0.0120 |
| 27 39 | 4 | 0.0457 | 0.1169 | 0.1671 | 0.5710 | 0.0315 | 0.0445 |
| 28 40 | 2 | 0.0300 | 0.2911 | 0.2608 | 0.0850 | 0.0284 | 0.2906 |

**Membership Matrix Section**

| Row | Cluster | Prob in 1 | Prob in 2 | Prob in 3 | Prob in 4 | Prob in 5 | Prob in 6 |
|---|---|---|---|---|---|---|---|
| 29 41 | 3 | 0.0347 | 0.0428 | 0.7471 | 0.0382 | 0.0124 | 0.1189 |
| 30 42 | 3 | 0.0213 | 0.3235 | 0.3569 | 0.0761 | 0.0192 | 0.1938 |
| 31 43 | 7 | 0.0104 | 0.0117 | 0.0112 | 0.0184 | 0.0399 | 0.0079 |
| 32 46 | 2 | 0.0129 | 0.6209 | 0.0635 | 0.2437 | 0.0170 | 0.0295 |
| 33 47 | 6 | 0.0171 | 0.0236 | 0.0816 | 0.0144 | 0.0069 | 0.8531 |
| 34 49 | 3 | 0.0243 | 0.0605 | 0.7777 | 0.0610 | 0.0102 | 0.0609 |
| 35 52 | 4 | 0.0162 | 0.2603 | 0.1647 | 0.5051 | 0.0131 | 0.0323 |
| 36 54 | 2 | 0.0099 | 0.7590 | 0.0551 | 0.1275 | 0.0129 | 0.0270 |
| 37 55 | 2 | 0.0052 | 0.8561 | 0.0545 | 0.0539 | 0.0068 | 0.0201 |
| 38 56 | 6 | 0.0601 | 0.0547 | 0.1155 | 0.0381 | 0.0289 | 0.6885 |
| 39 58 | 2 | 0.0088 | 0.7707 | 0.0500 | 0.1277 | 0.0115 | 0.0236 |
| 40 60 | 4 | 0.0069 | 0.0651 | 0.0286 | 0.8764 | 0.0073 | 0.0096 |
| 41 61 | 1 | 0.5757 | 0.0568 | 0.0999 | 0.0647 | 0.0505 | 0.1086 |
| 42 63 | 1 | 0.5714 | 0.0551 | 0.0912 | 0.0800 | 0.0600 | 0.0705 |
| 43 64 | 5 | 0.0062 | 0.0084 | 0.0092 | 0.0116 | 0.9320 | 0.0064 |
| 44 65 | 4 | 0.0245 | 0.1125 | 0.1226 | 0.6716 | 0.0230 | 0.0305 |
| 45 67 | 5 | 0.0308 | 0.0444 | 0.0555 | 0.0451 | 0.7337 | 0.0477 |
| 46 68 | 3 | 0.0170 | 0.0369 | 0.8016 | 0.0255 | 0.0066 | 0.1090 |
| 47 71 | 5 | 0.0575 | 0.0429 | 0.0663 | 0.0520 | 0.6642 | 0.0531 |
| 48 72 | 6 | 0.0546 | 0.0422 | 0.1022 | 0.0301 | 0.0214 | 0.7388 |
| 49 73 | 2 | 0.0076 | 0.8181 | 0.0487 | 0.0854 | 0.0103 | 0.0237 |
| 50 74 | 7 | 0.0900 | 0.1256 | 0.1053 | 0.1515 | 0.1382 | 0.0866 |
| 51 75 | 3 | 0.0223 | 0.2006 | 0.5514 | 0.1383 | 0.0126 | 0.0675 |
| 52 77 | 7 | 0.1262 | 0.0553 | 0.0736 | 0.0845 | 0.2012 | 0.0539 |
| 53 80 | 3 | 0.0594 | 0.1301 | 0.3884 | 0.3061 | 0.0287 | 0.0692 |
| 54 82 | 5 | 0.0199 | 0.0394 | 0.0346 | 0.0532 | 0.7047 | 0.0236 |
| 55 83 | 2 | 0.0076 | 0.5929 | 0.0706 | 0.2968 | 0.0085 | 0.0184 |
| 56 84 | 4 | 0.0717 | 0.1199 | 0.1120 | 0.4563 | 0.0772 | 0.0514 |
| 57 85 | 5 | 0.0176 | 0.0170 | 0.0213 | 0.0229 | 0.8524 | 0.0155 |
| 58 86 | 4 | 0.0140 | 0.0963 | 0.0480 | 0.7779 | 0.0253 | 0.0183 |
| 59 87 | 6 | 0.0218 | 0.0457 | 0.1000 | 0.0247 | 0.0137 | 0.7876 |
| 60 89 | 7 | 0.0240 | 0.0407 | 0.0325 | 0.0630 | 0.0872 | 0.0224 |
| 61 90 | 5 | 0.0047 | 0.0076 | 0.0082 | 0.0093 | 0.9513 | 0.0058 |
| 62 91 | 1 | 0.7966 | 0.0216 | 0.0658 | 0.0243 | 0.0143 | 0.0680 |
| 63 92 | 7 | 0.2113 | 0.0711 | 0.0938 | 0.0991 | 0.1499 | 0.0763 |
| 64 93 | 6 | 0.0165 | 0.0391 | 0.1078 | 0.0203 | 0.0101 | 0.8014 |
| 65 95 | 2 | 0.0066 | 0.8366 | 0.0605 | 0.0580 | 0.0075 | 0.0265 |
| 66 97 | 4 | 0.0181 | 0.1175 | 0.0627 | 0.7132 | 0.0376 | 0.0239 |
| 67 98 | 2 | 0.0057 | 0.7783 | 0.0387 | 0.1507 | 0.0074 | 0.0144 |
| 68 99 | 3 | 0.0190 | 0.0720 | 0.6946 | 0.0380 | 0.0087 | 0.1632 |
| 69 101 | 5 | 0.0632 | 0.0415 | 0.0574 | 0.0549 | 0.6051 | 0.0447 |
| 70 102 | 7 | 0.0268 | 0.0509 | 0.0396 | 0.0774 | 0.1303 | 0.0270 |
| 71 103 | 2 | 0.0090 | 0.6119 | 0.1047 | 0.2356 | 0.0098 | 0.0236 |
| 72 104 | 5 | 0.0116 | 0.0225 | 0.0225 | 0.0256 | 0.8709 | 0.0164 |

**Membership Matrix Section**

| Row | Cluster | Prob in 1 | Prob in 2 | Prob in 3 | Prob in 4 | Prob in 5 | Prob in 6 |
|---|---|---|---|---|---|---|---|
| 73 105 | 7 | 0.0209 | 0.0219 | 0.0207 | 0.0338 | 0.0488 | 0.0149 |
| 74 107 | 3 | 0.0200 | 0.0729 | 0.6117 | 0.0375 | 0.0132 | 0.2390 |
| 75 110 | 5 | 0.0264 | 0.0255 | 0.0321 | 0.0378 | 0.7712 | 0.0214 |
| 76 113 | 2 | 0.0143 | 0.4318 | 0.3686 | 0.0967 | 0.0133 | 0.0687 |
| 77 114 | 2 | 0.0259 | 0.4461 | 0.0944 | 0.3079 | 0.0400 | 0.0528 |
| 78 115 | 3 | 0.0259 | 0.0609 | 0.6129 | 0.0383 | 0.0157 | 0.2399 |
| 79 117 | 3 | 0.0159 | 0.2043 | 0.5861 | 0.0637 | 0.0126 | 0.1115 |
| 80 118 | 5 | 0.0157 | 0.0234 | 0.0233 | 0.0339 | 0.7745 | 0.0157 |
| 81 120 | 7 | 0.0262 | 0.0239 | 0.0258 | 0.0383 | 0.1358 | 0.0177 |
| 82 121 | 5 | 0.0092 | 0.0102 | 0.0123 | 0.0137 | 0.9170 | 0.0088 |
| 83 122 | 5 | 0.0222 | 0.0337 | 0.0409 | 0.0352 | 0.8002 | 0.0334 |
| 84 124 | 4 | 0.0601 | 0.2199 | 0.1175 | 0.2838 | 0.0973 | 0.0797 |
| 85 125 | 5 | 0.0382 | 0.0511 | 0.0674 | 0.0515 | 0.6857 | 0.0593 |
| 86 126 | 2 | 0.0075 | 0.7884 | 0.0439 | 0.1233 | 0.0103 | 0.0198 |
| 87 127 | 5 | 0.0282 | 0.0621 | 0.0505 | 0.0848 | 0.5372 | 0.0341 |
| 88 128 | 7 | 0.0408 | 0.0301 | 0.0323 | 0.0446 | 0.0782 | 0.0242 |
| 89 129 | 4 | 0.0287 | 0.2593 | 0.0853 | 0.5019 | 0.0399 | 0.0434 |
| 90 130 | 1 | 0.8206 | 0.0210 | 0.0502 | 0.0241 | 0.0175 | 0.0541 |
| 91 131 | 5 | 0.1855 | 0.0670 | 0.1164 | 0.0850 | 0.3351 | 0.0976 |
| 92 132 | 3 | 0.0266 | 0.2788 | 0.2974 | 0.0776 | 0.0245 | 0.2834 |
| 93 133 | 5 | 0.0076 | 0.0123 | 0.0123 | 0.0160 | 0.9089 | 0.0087 |
| 94 134 | 1 | 0.3379 | 0.0846 | 0.1143 | 0.1143 | 0.1007 | 0.0958 |
| 95 135 | 2 | 0.0085 | 0.6930 | 0.1339 | 0.1236 | 0.0085 | 0.0279 |
| 96 136 | 5 | 0.0583 | 0.0442 | 0.0617 | 0.0516 | 0.6444 | 0.0538 |
| 97 138 | 5 | 0.0325 | 0.0335 | 0.0490 | 0.0398 | 0.7682 | 0.0368 |
| 98 139 | 2 | 0.0187 | 0.5539 | 0.1910 | 0.0893 | 0.0212 | 0.1154 |
| 99 140 | 2 | 0.0046 | 0.8273 | 0.0510 | 0.0958 | 0.0049 | 0.0136 |
| 100 141 | 1 | 0.6140 | 0.0373 | 0.1310 | 0.0394 | 0.0206 | 0.1447 |
| 101 142 | 1 | 0.6704 | 0.0402 | 0.0741 | 0.0570 | 0.0501 | 0.0582 |
| 102 143 | 6 | 0.1101 | 0.0443 | 0.1467 | 0.0354 | 0.0213 | 0.6308 |
| 103 144 | 7 | 0.0507 | 0.0772 | 0.0625 | 0.1086 | 0.1106 | 0.0463 |
| 104 146 | 1 | 0.6792 | 0.0352 | 0.1208 | 0.0464 | 0.0249 | 0.0774 |
| 105 147 | 2 | 0.0092 | 0.6844 | 0.0842 | 0.1746 | 0.0144 | 0.0260 |
| 106 148 | 5 | 0.0085 | 0.0112 | 0.0121 | 0.0155 | 0.9028 | 0.0084 |
| 107 149 | 2 | 0.0031 | 0.8919 | 0.0311 | 0.0586 | 0.0037 | 0.0096 |
| 108 150 | 2 | 0.0126 | 0.7377 | 0.0824 | 0.0950 | 0.0163 | 0.0466 |
| 109 151 | 2 | 0.0064 | 0.8271 | 0.0721 | 0.0551 | 0.0077 | 0.0277 |
| 110 152 | 5 | 0.0110 | 0.0180 | 0.0203 | 0.0200 | 0.8937 | 0.0154 |
| 111 153 | 5 | 0.0067 | 0.0097 | 0.0112 | 0.0114 | 0.9371 | 0.0084 |
| 112 154 | 5 | 0.0248 | 0.0254 | 0.0291 | 0.0366 | 0.7124 | 0.0205 |
| 113 155 | 5 | 0.0389 | 0.0369 | 0.0538 | 0.0420 | 0.7374 | 0.0443 |
| 114 156 | 7 | 0.0240 | 0.0414 | 0.0347 | 0.0666 | 0.1731 | 0.0229 |
| 115 158 | 3 | 0.0553 | 0.0435 | 0.4705 | 0.0345 | 0.0135 | 0.3759 |
| 116 159 | 5 | 0.0155 | 0.0291 | 0.0265 | 0.0387 | 0.7854 | 0.0183 |

**Membership Matrix Section**

| Row | Cluster | Prob in 1 | Prob in 2 | Prob in 3 | Prob in 4 | Prob in 5 | Prob in 6 |
|---|---|---|---|---|---|---|---|
| 117 161 | 1 | 0.4079 | 0.0582 | 0.1408 | 0.0551 | 0.0442 | 0.2676 |
| 118 163 | 4 | 0.0176 | 0.0760 | 0.0559 | 0.7988 | 0.0173 | 0.0189 |
| 119 164 | 3 | 0.0153 | 0.1098 | 0.7127 | 0.0480 | 0.0087 | 0.1010 |
| 120 165 | 7 | 0.0327 | 0.0238 | 0.0262 | 0.0360 | 0.0792 | 0.0193 |
| 121 168 | 4 | 0.0129 | 0.1038 | 0.0445 | 0.7950 | 0.0137 | 0.0172 |
| 122 171 | 4 | 0.0083 | 0.2024 | 0.0404 | 0.7134 | 0.0119 | 0.0149 |
| 123 172 | 3 | 0.0460 | 0.0669 | 0.6964 | 0.0796 | 0.0188 | 0.0830 |

**Membership Matrix Section**

| Row | Cluster | Prob in 7 |
|---|---|---|
| 1 1 | 6 | 0.0065 |
| 2 2 | 3 | 0.0063 |
| 3 3 | 4 | 0.0069 |
| 4 4 | 2 | 0.0067 |
| 5 6 | 5 | 0.0121 |
| 6 7 | 6 | 0.0046 |
| 7 10 | 3 | 0.0089 |
| 8 11 | 1 | 0.0117 |
| 9 12 | 2 | 0.0037 |
| 10 13 | 6 | 0.0046 |
| 11 14 | 6 | 0.0063 |
| 12 15 | 3 | 0.0109 |
| 13 19 | 5 | 0.0785 |
| 14 20 | 4 | 0.0086 |
| 15 21 | 5 | 0.0283 |
| 16 22 | 4 | 0.0062 |
| 17 26 | 5 | 0.0137 |
| 18 27 | 1 | 0.1463 |
| 19 29 | 3 | 0.0171 |
| 20 31 | 5 | 0.0153 |
| 21 32 | 5 | 0.1126 |
| 22 34 | 2 | 0.0025 |
| 23 35 | 5 | 0.0689 |
| 24 36 | 1 | 0.0485 |
| 25 37 | 3 | 0.0097 |
| 26 38 | 4 | 0.0056 |
| 27 39 | 4 | 0.0233 |
| 28 40 | 2 | 0.0140 |
| 29 41 | 3 | 0.0058 |
| 30 42 | 3 | 0.0092 |
| 31 43 | 7 | 0.9007 |
| 32 46 | 2 | 0.0124 |
| 33 47 | 6 | 0.0035 |
| 34 49 | 3 | 0.0054 |

**Membership Matrix Section**

| Row | Cluster | Prob in 7 |
|---|---|---|
| 35 52 | 4 | 0.0083 |
| 36 54 | 2 | 0.0086 |
| 37 55 | 2 | 0.0035 |
| 38 56 | 6 | 0.0142 |
| 39 58 | 2 | 0.0077 |
| 40 60 | 4 | 0.0061 |
| 41 61 | 1 | 0.0437 |
| 42 63 | 1 | 0.0717 |
| 43 64 | 5 | 0.0262 |
| 44 65 | 4 | 0.0152 |
| 45 67 | 5 | 0.0428 |
| 46 68 | 3 | 0.0033 |
| 47 71 | 5 | 0.0640 |
| 48 72 | 6 | 0.0106 |
| 49 73 | 2 | 0.0062 |
| 50 74 | 7 | 0.3028 |
| 51 75 | 3 | 0.0073 |
| 52 77 | 7 | 0.4052 |
| 53 80 | 3 | 0.0181 |
| 54 82 | 5 | 0.1245 |
| 55 83 | 2 | 0.0052 |
| 56 84 | 4 | 0.1115 |
| 57 85 | 5 | 0.0534 |
| 58 86 | 4 | 0.0202 |
| 59 87 | 6 | 0.0065 |
| 60 89 | 7 | 0.7302 |
| 61 90 | 5 | 0.0130 |
| 62 91 | 1 | 0.0094 |
| 63 92 | 7 | 0.2984 |
| 64 93 | 6 | 0.0047 |
| 65 95 | 2 | 0.0042 |
| 66 97 | 4 | 0.0271 |
| 67 98 | 2 | 0.0047 |
| 68 99 | 3 | 0.0046 |
| 69 101 | 5 | 0.1332 |
| 70 102 | 7 | 0.6480 |
| 71 103 | 2 | 0.0055 |
| 72 104 | 5 | 0.0304 |
| 73 105 | 7 | 0.8389 |
| 74 107 | 3 | 0.0056 |
| 75 110 | 5 | 0.0856 |
| 76 113 | 2 | 0.0065 |
| 77 114 | 2 | 0.0327 |
| 78 115 | 3 | 0.0064 |

**Membership Matrix Section**

| Row | Cluster | Prob in 7 |
|---|---|---|
| 79 117 | 3 | 0.0060 |
| 80 118 | 5 | 0.1136 |
| 81 120 | 7 | 0.7323 |
| 82 121 | 5 | 0.0287 |
| 83 122 | 5 | 0.0343 |
| 84 124 | 4 | 0.1418 |
| 85 125 | 5 | 0.0467 |
| 86 126 | 2 | 0.0067 |
| 87 127 | 5 | 0.2031 |
| 88 128 | 7 | 0.7500 |
| 89 129 | 4 | 0.0414 |
| 90 130 | 1 | 0.0125 |
| 91 131 | 5 | 0.1134 |
| 92 132 | 3 | 0.0117 |
| 93 133 | 5 | 0.0342 |
| 94 134 | 1 | 0.1523 |
| 95 135 | 2 | 0.0046 |
| 96 136 | 5 | 0.0861 |
| 97 138 | 5 | 0.0403 |
| 98 139 | 2 | 0.0105 |
| 99 140 | 2 | 0.0029 |
| 100 141 | 1 | 0.0130 |
| 101 142 | 1 | 0.0500 |
| 102 143 | 6 | 0.0114 |
| 103 144 | 7 | 0.5443 |
| 104 146 | 1 | 0.0161 |
| 105 147 | 2 | 0.0072 |
| 106 148 | 5 | 0.0415 |
| 107 149 | 2 | 0.0021 |
| 108 150 | 2 | 0.0094 |
| 109 151 | 2 | 0.0040 |
| 110 152 | 5 | 0.0217 |
| 111 153 | 5 | 0.0155 |
| 112 154 | 5 | 0.1513 |
| 113 155 | 5 | 0.0467 |
| 114 156 | 7 | 0.6373 |
| 115 158 | 3 | 0.0068 |
| 116 159 | 5 | 0.0864 |
| 117 161 | 1 | 0.0263 |
| 118 163 | 4 | 0.0155 |
| 119 164 | 3 | 0.0045 |
| 120 165 | 7 | 0.7826 |
| 121 168 | 4 | 0.0129 |
| 122 171 | 4 | 0.0088 |

**Membership Matrix Section**

| Row | Cluster | Prob in 7 |
|---|---|---|
| 123 172 | 3 | 0.0093 |

**Cluster Medoids Section**

| Variable | Cluster1 | Cluster2 | Cluster3 | Cluster4 | Cluster5 | Cluster6 |
|---|---|---|---|---|---|---|
| Factor1 | -0.0199 | -0.0853 | 1.0327 | 1.0082 | -1.371 | -0.4908 |
| Factor2 | -0.982 | -0.4938 | -0.14 | 2.2898 | 0.7289 | 1.2297 |
| Factor3 | -0.7548 | 0.7214 | 1.0032 | 0.3485 | -1.0087 | -0.6199 |
| Row | 6 7 | 107 149 | 40 60 | 31 43 | 83 122 | 43 64 |

**Cluster Medoids Section**

| Variable | Cluster7 | Cluster8 |
|---|---|---|
| Factor1 | 1.8883 | 5.0024 |
| Factor2 | -1.1105 | 0.1069 |
| Factor3 | -1.6443 | -1.6136 |
| Row | 8 11 | 42 63 |

**Membership Summary Section for Clusters = 8**

<table>
<tr><th>Row</th><th>Cluster</th><th>Cluster Membership</th><th>Sum of Squared Memberships</th><th>Bar of Squared Memberships</th><th>Silhouette Amount</th><th>Silhouette Bar</th></tr>
<tr><td>6 7</td><td>1</td><td>0.8695</td><td>0.7600</td><td>|IIIIIIIIIIIIIIIIIIIIIII</td><td>0.5378</td><td>|IIIIIIIIIIIIIIII</td></tr>
<tr><td>46 68</td><td>1</td><td>0.8296</td><td>0.6952</td><td>|IIIIIIIIIIIIIIIIIIIII</td><td>0.4086</td><td>|IIIIIIIIIIII</td></tr>
<tr><td>74 107</td><td>1</td><td>0.8256</td><td>0.6895</td><td>|IIIIIIIIIIIIIIIIIIIII</td><td>0.3915</td><td>|IIIIIIIIIIII</td></tr>
<tr><td>78 115</td><td>1</td><td>0.8064</td><td>0.6585</td><td>|IIIIIIIIIIIIIIIIIIII</td><td>0.4205</td><td>|IIIIIIIIIIIII</td></tr>
<tr><td>68 99</td><td>1</td><td>0.7904</td><td>0.6370</td><td>|IIIIIIIIIIIIIIIIIII</td><td>0.3368</td><td>|IIIIIIIIII</td></tr>
<tr><td>1 1</td><td>1</td><td>0.7638</td><td>0.5998</td><td>|IIIIIIIIIIIIIIIIII</td><td>0.4725</td><td>|IIIIIIIIIIIIII</td></tr>
<tr><td>115 158</td><td>1</td><td>0.7552</td><td>0.5891</td><td>|IIIIIIIIIIIIIIIIII</td><td>0.4448</td><td>|IIIIIIIIIIIII</td></tr>
<tr><td>64 93</td><td>1</td><td>0.7181</td><td>0.5331</td><td>|IIIIIIIIIIIIIIII</td><td>0.4693</td><td>|IIIIIIIIIIIIII</td></tr>
<tr><td>33 47</td><td>1</td><td>0.7158</td><td>0.5314</td><td>|IIIIIIIIIIIIIIII</td><td>0.5138</td><td>|IIIIIIIIIIIIIII</td></tr>
<tr><td>11 14</td><td>1</td><td>0.7106</td><td>0.5325</td><td>|IIIIIIIIIIIIIIII</td><td>0.4307</td><td>|IIIIIIIIIIIII</td></tr>
<tr><td>2 2</td><td>1</td><td>0.6957</td><td>0.5086</td><td>|IIIIIIIIIIIIIII</td><td>0.4186</td><td>|IIIIIIIIIIIII</td></tr>
<tr><td>29 41</td><td>1</td><td>0.6930</td><td>0.5015</td><td>|IIIIIIIIIIIIIII</td><td>0.3852</td><td>|IIIIIIIIIIII</td></tr>
<tr><td>119 164</td><td>1</td><td>0.6438</td><td>0.4604</td><td>|IIIIIIIIIIIIII</td><td>0.1327</td><td>|IIII</td></tr>
<tr><td>10 13</td><td>1</td><td>0.6207</td><td>0.4159</td><td>|IIIIIIIIIIII</td><td>0.4874</td><td>|IIIIIIIIIIIIIII</td></tr>
<tr><td>59 87</td><td>1</td><td>0.6170</td><td>0.4113</td><td>|IIIIIIIIIIII</td><td>0.4374</td><td>|IIIIIIIIIIIII</td></tr>
<tr><td>7 10</td><td>1</td><td>0.6053</td><td>0.4248</td><td>|IIIIIIIIIIIII</td><td>0.1828</td><td>|IIIII</td></tr>
<tr><td>34 49</td><td>1</td><td>0.5062</td><td>0.3192</td><td>|IIIIIIIIII</td><td>0.1531</td><td>|IIIII</td></tr>
<tr><td>79 117</td><td>1</td><td>0.5041</td><td>0.3664</td><td>|IIIIIIIIIII</td><td>-0.0422</td><td>|</td></tr>
<tr><td>123 172</td><td>1</td><td>0.4534</td><td>0.2721</td><td>|IIIIIIII</td><td>0.1955</td><td>|IIIIII</td></tr>
<tr><td>92 132</td><td>1</td><td>0.4454</td><td>0.3265</td><td>|IIIIIIIIII</td><td>0.0252</td><td>|I</td></tr>
<tr><td>48 72</td><td>1</td><td>0.4404</td><td>0.2737</td><td>|IIIIIIII</td><td>0.3178</td><td>|IIIIIIIIII</td></tr>
<tr><td>38 56</td><td>1</td><td>0.4181</td><td>0.2487</td><td>|IIIIIII</td><td>0.3394</td><td>|IIIIIIIIII</td></tr>
<tr><td>30 42</td><td>1</td><td>0.4150</td><td>0.3435</td><td>|IIIIIIIIII</td><td>-0.0851</td><td>|</td></tr>
<tr><td>28 40</td><td>1</td><td>0.3961</td><td>0.3005</td><td>|IIIIIIIII</td><td>-0.0186</td><td>|</td></tr>
</table>

**Membership Summary Section for Clusters = 8**

<table>
<tr><th>Row</th><th>Cluster</th><th>Cluster Membership</th><th>Sum of Squared Memberships</th><th>Bar of Squared Memberships</th><th>Silhouette Amount</th><th>Silhouette Bar</th></tr>
<tr><td>107 149</td><td>2</td><td>0.8872</td><td>0.7936</td><td>|IIIIIIIIIIIIIIIIIIIIIIII</td><td>0.5812</td><td>|IIIIIIIIIIIIIIIII</td></tr>
<tr><td>37 55</td><td>2</td><td>0.8798</td><td>0.7790</td><td>|IIIIIIIIIIIIIIIIIIIIIII</td><td>0.6154</td><td>|IIIIIIIIIIIIIIIIII</td></tr>
<tr><td>109 151</td><td>2</td><td>0.8658</td><td>0.7554</td><td>|IIIIIIIIIIIIIIIIIIIIIII</td><td>0.5978</td><td>|IIIIIIIIIIIIIIIIII</td></tr>
<tr><td>65 95</td><td>2</td><td>0.8592</td><td>0.7448</td><td>|IIIIIIIIIIIIIIIIIIIIII</td><td>0.6201</td><td>|IIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>22 34</td><td>2</td><td>0.8512</td><td>0.7365</td><td>|IIIIIIIIIIIIIIIIIIIIII</td><td>0.5438</td><td>|IIIIIIIIIIIIIIII</td></tr>
<tr><td>99 140</td><td>2</td><td>0.8268</td><td>0.6999</td><td>|IIIIIIIIIIIIIIIIIIIII</td><td>0.5235</td><td>|IIIIIIIIIIIIIIII</td></tr>
<tr><td>9 12</td><td>2</td><td>0.8127</td><td>0.6758</td><td>|IIIIIIIIIIIIIIIIIIII</td><td>0.5256</td><td>|IIIIIIIIIIIIIIII</td></tr>
<tr><td>49 73</td><td>2</td><td>0.8059</td><td>0.6631</td><td>|IIIIIIIIIIIIIIIIIIII</td><td>0.5856</td><td>|IIIIIIIIIIIIIIIIII</td></tr>
<tr><td>86 126</td><td>2</td><td>0.7550</td><td>0.5977</td><td>|IIIIIIIIIIIIIIIIII</td><td>0.5317</td><td>|IIIIIIIIIIIIIIII</td></tr>
<tr><td>95 135</td><td>2</td><td>0.7524</td><td>0.5929</td><td>|IIIIIIIIIIIIIIIIII</td><td>0.4825</td><td>|IIIIIIIIIIIIII</td></tr>
<tr><td>108 150</td><td>2</td><td>0.7509</td><td>0.5820</td><td>|IIIIIIIIIIIIIIIII</td><td>0.5724</td><td>|IIIIIIIIIIIIIIIII</td></tr>
<tr><td>39 58</td><td>2</td><td>0.7401</td><td>0.5771</td><td>|IIIIIIIIIIIIIIIII</td><td>0.5282</td><td>|IIIIIIIIIIIIIIII</td></tr>
<tr><td>36 54</td><td>2</td><td>0.7330</td><td>0.5661</td><td>|IIIIIIIIIIIIIIIII</td><td>0.5297</td><td>|IIIIIIIIIIIIIIII</td></tr>
<tr><td>67 98</td><td>2</td><td>0.7327</td><td>0.5796</td><td>|IIIIIIIIIIIIIIIII</td><td>0.4845</td><td>|IIIIIIIIIIIIIII</td></tr>
<tr><td>4 4</td><td>2</td><td>0.7233</td><td>0.5502</td><td>|IIIIIIIIIIIIIIIII</td><td>0.4205</td><td>|IIIIIIIIIIIII</td></tr>
<tr><td>105 147</td><td>2</td><td>0.6870</td><td>0.5189</td><td>|IIIIIIIIIIIIIIII</td><td>0.4462</td><td>|IIIIIIIIIIIII</td></tr>
<tr><td>98 139</td><td>2</td><td>0.6281</td><td>0.4404</td><td>|IIIIIIIIIIIII</td><td>0.3478</td><td>|IIIIIIIIII</td></tr>
<tr><td>71 103</td><td>2</td><td>0.6080</td><td>0.4644</td><td>|IIIIIIIIIIIIII</td><td>0.3701</td><td>|IIIIIIIIIII</td></tr>
<tr><td>76 113</td><td>2</td><td>0.5901</td><td>0.4119</td><td>|IIIIIIIIIIII</td><td>0.3269</td><td>|IIIIIIIIII</td></tr>
<tr><td>32 46</td><td>2</td><td>0.5826</td><td>0.4278</td><td>|IIIIIIIIIIIII</td><td>0.3916</td><td>|IIIIIIIIIIII</td></tr>
<tr><td>55 83</td><td>2</td><td>0.5454</td><td>0.4467</td><td>|IIIIIIIIIIIII</td><td>0.3350</td><td>|IIIIIIIIII</td></tr>
<tr><td>77 114</td><td>2</td><td>0.4278</td><td>0.3018</td><td>|IIIIIIIII</td><td>0.2441</td><td>|IIIIIII</td></tr>
<tr><td>51 75</td><td>2</td><td>0.3352</td><td>0.2710</td><td>|IIIIIIII</td><td>0.1614</td><td>|IIIII</td></tr>
<tr><td>40 60</td><td>3</td><td>0.8760</td><td>0.7728</td><td>|IIIIIIIIIIIIIIIIIIIIIII</td><td>0.3280</td><td>|IIIIIIIIII</td></tr>
<tr><td>3 3</td><td>3</td><td>0.8529</td><td>0.7356</td><td>|IIIIIIIIIIIIIIIIIIIIII</td><td>0.2684</td><td>|IIIIIIII</td></tr>
<tr><td>16 22</td><td>3</td><td>0.8307</td><td>0.7030</td><td>|IIIIIIIIIIIIIIIIIIIII</td><td>0.1684</td><td>|IIIII</td></tr>
<tr><td>26 38</td><td>3</td><td>0.8005</td><td>0.6637</td><td>|IIIIIIIIIIIIIIIIIIII</td><td>0.0144</td><td>|</td></tr>
<tr><td>118 163</td><td>3</td><td>0.7901</td><td>0.6343</td><td>|IIIIIIIIIIIIIIIIIII</td><td>0.4032</td><td>|IIIIIIIIIIII</td></tr>
<tr><td>121 168</td><td>3</td><td>0.7868</td><td>0.6335</td><td>|IIIIIIIIIIIIIIIIIII</td><td>0.3053</td><td>|IIIIIIIII</td></tr>
<tr><td>58 86</td><td>3</td><td>0.7384</td><td>0.5621</td><td>|IIIIIIIIIIIIIIIII</td><td>0.3093</td><td>|IIIIIIIII</td></tr>
<tr><td>122 171</td><td>3</td><td>0.7310</td><td>0.5730</td><td>|IIIIIIIIIIIIIIIII</td><td>-0.0085</td><td>|</td></tr>
<tr><td>44 65</td><td>3</td><td>0.7291</td><td>0.5500</td><td>|IIIIIIIIIIIIIIII</td><td>0.3043</td><td>|IIIIIIIII</td></tr>
<tr><td>66 97</td><td>3</td><td>0.6737</td><td>0.4783</td><td>|IIIIIIIIIIIIII</td><td>0.2698</td><td>|IIIIIIII</td></tr>
<tr><td>14 20</td><td>3</td><td>0.6477</td><td>0.4887</td><td>|IIIIIIIIIIIIIII</td><td>-0.0813</td><td>|</td></tr>
<tr><td>35 52</td><td>3</td><td>0.6413</td><td>0.4737</td><td>|IIIIIIIIIIIIII</td><td>-0.0443</td><td>|</td></tr>
<tr><td>27 39</td><td>3</td><td>0.6295</td><td>0.4243</td><td>|IIIIIIIIIIIII</td><td>0.3300</td><td>|IIIIIIIIII</td></tr>
<tr><td>89 129</td><td>3</td><td>0.4950</td><td>0.3220</td><td>|IIIIIIIIII</td><td>0.0544</td><td>|II</td></tr>
<tr><td>53 80</td><td>3</td><td>0.4424</td><td>0.2684</td><td>|IIIIIIII</td><td>0.1780</td><td>|IIIII</td></tr>
<tr><td>25 37</td><td>3</td><td>0.4289</td><td>0.3066</td><td>|IIIIIIIII</td><td>-0.1226</td><td>|</td></tr>
<tr><td>56 84</td><td>3</td><td>0.4093</td><td>0.2204</td><td>|IIIIIII</td><td>0.3404</td><td>|IIIIIIIIII</td></tr>
<tr><td>12 15</td><td>3</td><td>0.3599</td><td>0.2499</td><td>|IIIIIII</td><td>0.0035</td><td>|</td></tr>
<tr><td>84 124</td><td>3</td><td>0.2600</td><td>0.1627</td><td>|IIIII</td><td>0.0284</td><td>|I</td></tr>
</table>

**Membership Summary Section for Clusters = 8**

<table>
<tr><th>Row</th><th>Cluster</th><th>Cluster Membership</th><th>Sum of Squared Memberships</th><th>Bar of Squared Memberships</th><th>Silhouette Amount</th><th>Silhouette Bar</th></tr>
<tr><td>31 43</td><td>4</td><td>0.8845</td><td>0.7853</td><td>|IIIIIIIIIIIIIIIIIIIIIIII</td><td>0.1403</td><td>|IIII</td></tr>
<tr><td>73 105</td><td>4</td><td>0.8437</td><td>0.7160</td><td>|IIIIIIIIIIIIIIIIIIIII</td><td>0.3291</td><td>|IIIIIIIIII</td></tr>
<tr><td>60 89</td><td>4</td><td>0.7380</td><td>0.5582</td><td>|IIIIIIIIIIIIIIIII</td><td>0.1421</td><td>|IIII</td></tr>
<tr><td>120 165</td><td>4</td><td>0.6804</td><td>0.4822</td><td>|IIIIIIIIIIIIII</td><td>0.1241</td><td>|IIII</td></tr>
<tr><td>88 128</td><td>4</td><td>0.6726</td><td>0.4709</td><td>|IIIIIIIIIIIIII</td><td>0.2363</td><td>|IIIIIII</td></tr>
<tr><td>70 102</td><td>4</td><td>0.6145</td><td>0.4110</td><td>|IIIIIIIIIIII</td><td>-0.0828</td><td>|</td></tr>
<tr><td>81 120</td><td>4</td><td>0.5668</td><td>0.3738</td><td>|IIIIIIIIIII</td><td>-0.2588</td><td>|</td></tr>
<tr><td>103 144</td><td>4</td><td>0.5527</td><td>0.3378</td><td>|IIIIIIIIII</td><td>0.2896</td><td>|IIIIIIIII</td></tr>
<tr><td>114 156</td><td>4</td><td>0.5270</td><td>0.3464</td><td>|IIIIIIIIII</td><td>-0.3186</td><td>|</td></tr>
<tr><td>50 74</td><td>4</td><td>0.2877</td><td>0.1583</td><td>|IIIII</td><td>0.2092</td><td>|IIIIII</td></tr>
<tr><td>52 77</td><td>4</td><td>0.2552</td><td>0.1693</td><td>|IIIII</td><td>-0.2277</td><td>|</td></tr>
<tr><td>83 122</td><td>5</td><td>0.8613</td><td>0.7501</td><td>|IIIIIIIIIIIIIIIIIIIIIII</td><td>0.2851</td><td>|IIIIIIIII</td></tr>
<tr><td>113 155</td><td>5</td><td>0.8513</td><td>0.7326</td><td>|IIIIIIIIIIIIIIIIIIIIII</td><td>0.4088</td><td>|IIIIIIIIIIII</td></tr>
<tr><td>45 67</td><td>5</td><td>0.8464</td><td>0.7248</td><td>|IIIIIIIIIIIIIIIIIIIIII</td><td>0.3518</td><td>|IIIIIIIIIII</td></tr>
<tr><td>85 125</td><td>5</td><td>0.8380</td><td>0.7104</td><td>|IIIIIIIIIIIIIIIIIIIII</td><td>0.3963</td><td>|IIIIIIIIIIII</td></tr>
<tr><td>97 138</td><td>5</td><td>0.8192</td><td>0.6843</td><td>|IIIIIIIIIIIIIIIIIIIII</td><td>0.2944</td><td>|IIIIIIIII</td></tr>
<tr><td>110 152</td><td>5</td><td>0.7728</td><td>0.6286</td><td>|IIIIIIIIIIIIIIIIIII</td><td>-0.0046</td><td>|</td></tr>
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<tr><td>96 136</td><td>5</td><td>0.6443</td><td>0.4561</td><td>|IIIIIIIIIIIIII</td><td>0.3082</td><td>|IIIIIIIII</td></tr>
<tr><td>23 35</td><td>5</td><td>0.5650</td><td>0.3543</td><td>|IIIIIIIIIII</td><td>0.3900</td><td>|IIIIIIIIIIII</td></tr>
<tr><td>69 101</td><td>5</td><td>0.4406</td><td>0.3049</td><td>|IIIIIIIII</td><td>0.0313</td><td>|I</td></tr>
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<tr><td>43 64</td><td>6</td><td>0.9023</td><td>0.8194</td><td>|IIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.5786</td><td>|IIIIIIIIIIIIIIIII</td></tr>
<tr><td>106 148</td><td>6</td><td>0.8958</td><td>0.8079</td><td>|IIIIIIIIIIIIIIIIIIIIIIII</td><td>0.5824</td><td>|IIIIIIIIIIIIIIIII</td></tr>
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<tr><td>13 19</td><td>6</td><td>0.8591</td><td>0.7448</td><td>|IIIIIIIIIIIIIIIIIIIIII</td><td>0.5978</td><td>|IIIIIIIIIIIIIIIIII</td></tr>
<tr><td>21 32</td><td>6</td><td>0.8186</td><td>0.6806</td><td>|IIIIIIIIIIIIIIIIIIII</td><td>0.5613</td><td>|IIIIIIIIIIIIIIIII</td></tr>
<tr><td>116 159</td><td>6</td><td>0.8115</td><td>0.6711</td><td>|IIIIIIIIIIIIIIIIIIII</td><td>0.5743</td><td>|IIIIIIIIIIIIIIIII</td></tr>
<tr><td>20 31</td><td>6</td><td>0.7757</td><td>0.6354</td><td>|IIIIIIIIIIIIIIIIIII</td><td>0.4936</td><td>|IIIIIIIIIIIIIII</td></tr>
<tr><td>54 82</td><td>6</td><td>0.7549</td><td>0.5878</td><td>|IIIIIIIIIIIIIIIIII</td><td>0.5555</td><td>|IIIIIIIIIIIIIIIII</td></tr>
<tr><td>17 26</td><td>6</td><td>0.7054</td><td>0.5602</td><td>|IIIIIIIIIIIIIIIII</td><td>0.4340</td><td>|IIIIIIIIIIIII</td></tr>
<tr><td>112 154</td><td>6</td><td>0.6759</td><td>0.4938</td><td>|IIIIIIIIIIIIIII</td><td>0.4339</td><td>|IIIIIIIIIIIII</td></tr>
<tr><td>82 121</td><td>6</td><td>0.6528</td><td>0.5080</td><td>|IIIIIIIIIIIIIII</td><td>0.3619</td><td>|IIIIIIIIIII</td></tr>
<tr><td>5 6</td><td>6</td><td>0.6189</td><td>0.4948</td><td>|IIIIIIIIIIIIIII</td><td>0.3905</td><td>|IIIIIIIIIIII</td></tr>
<tr><td>75 110</td><td>6</td><td>0.6025</td><td>0.4337</td><td>|IIIIIIIIIIIII</td><td>0.3371</td><td>|IIIIIIIIII</td></tr>
<tr><td>87 127</td><td>6</td><td>0.5970</td><td>0.3955</td><td>|IIIIIIIIIIII</td><td>0.4897</td><td>|IIIIIIIIIIIIIII</td></tr>
<tr><td>61 90</td><td>6</td><td>0.5968</td><td>0.4816</td><td>|IIIIIIIIIIIIII</td><td>0.3761</td><td>|IIIIIIIIIII</td></tr>
<tr><td>57 85</td><td>6</td><td>0.5371</td><td>0.4214</td><td>|IIIIIIIIIIIII</td><td>0.2407</td><td>|IIIIIII</td></tr>
<tr><td>72 104</td><td>6</td><td>0.4546</td><td>0.4097</td><td>|IIIIIIIIIIII</td><td>0.2569</td><td>|IIIIIIII</td></tr>
</table>

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<table>
<tr><th>Row</th><th>Cluster</th><th>Cluster Membership</th><th>Sum of Squared Memberships</th><th>Bar of Squared Memberships</th><th>Silhouette Amount</th><th>Silhouette Bar</th></tr>
<tr><td>8 11</td><td>7</td><td>0.9385</td><td>0.8816</td><td>|||||||||||||||||||||||||||</td><td>0.4578</td><td>|||||||||||||||</td></tr>
<tr><td>62 91</td><td>7</td><td>0.9223</td><td>0.8519</td><td>|||||||||||||||||||||||||||</td><td>0.5040</td><td>||||||||||||||||</td></tr>
<tr><td>100 141</td><td>7</td><td>0.9151</td><td>0.8391</td><td>||||||||||||||||||||||||||</td><td>0.4065</td><td>|||||||||||||</td></tr>
<tr><td>90 130</td><td>7</td><td>0.7154</td><td>0.5309</td><td>|||||||||||||||||</td><td>0.5137</td><td>||||||||||||||||</td></tr>
<tr><td>104 146</td><td>7</td><td>0.6555</td><td>0.4531</td><td>|||||||||||||||</td><td>0.3062</td><td>||||||||||</td></tr>
<tr><td>117 161</td><td>7</td><td>0.6330</td><td>0.4283</td><td>||||||||||||||</td><td>0.3239</td><td>|||||||||||</td></tr>
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<tr><td>19 29</td><td>7</td><td>0.3330</td><td>0.2377</td><td>||||||||</td><td>-0.1780</td><td>|</td></tr>
<tr><td>41 61</td><td>7</td><td>0.3297</td><td>0.2361</td><td>||||||||</td><td>0.3936</td><td>|||||||||||||</td></tr>
<tr><td>42 63</td><td>8</td><td>0.8938</td><td>0.8009</td><td>|||||||||||||||||||||||||</td><td>-0.3345</td><td>|</td></tr>
<tr><td>101 142</td><td>8</td><td>0.8764</td><td>0.7712</td><td>||||||||||||||||||||||||</td><td>-0.4429</td><td>|</td></tr>
<tr><td>94 134</td><td>8</td><td>0.6157</td><td>0.4014</td><td>|||||||||||||</td><td>0.0120</td><td>|</td></tr>
<tr><td>24 36</td><td>8</td><td>0.5066</td><td>0.3065</td><td>||||||||||</td><td>-0.5735</td><td>|</td></tr>
<tr><td>63 92</td><td>8</td><td>0.3933</td><td>0.2174</td><td>||||||||</td><td>-0.2140</td><td>|</td></tr>
<tr><td>18 27</td><td>8</td><td>0.2005</td><td>0.1326</td><td>|||||</td><td>0.1050</td><td>||||</td></tr>
</table>

**Membership Matrix Section**

| Row | Cluster | Prob in 1 | Prob in 2 | Prob in 3 | Prob in 4 | Prob in 5 | Prob in 6 |
|---|---|---|---|---|---|---|---|
| 1 1 | 1 | 0.7638 | 0.0476 | 0.0356 | 0.0055 | 0.0140 | 0.0101 |
| 2 2 | 1 | 0.6957 | 0.0644 | 0.0582 | 0.0071 | 0.0178 | 0.0133 |
| 3 3 | 3 | 0.0188 | 0.0858 | 0.8529 | 0.0079 | 0.0098 | 0.0114 |
| 4 4 | 2 | 0.1390 | 0.7233 | 0.0840 | 0.0056 | 0.0139 | 0.0114 |
| 5 6 | 6 | 0.0077 | 0.0086 | 0.0101 | 0.0119 | 0.3336 | 0.6189 |
| 6 7 | 1 | 0.8695 | 0.0349 | 0.0221 | 0.0036 | 0.0112 | 0.0075 |
| 7 10 | 1 | 0.6053 | 0.2256 | 0.0711 | 0.0081 | 0.0242 | 0.0176 |
| 8 11 | 7 | 0.0244 | 0.0070 | 0.0075 | 0.0023 | 0.0051 | 0.0038 |
| 9 12 | 2 | 0.0468 | 0.8127 | 0.1135 | 0.0031 | 0.0067 | 0.0060 |
| 10 13 | 1 | 0.6207 | 0.0930 | 0.0565 | 0.0135 | 0.0411 | 0.0273 |
| 11 14 | 1 | 0.7106 | 0.0456 | 0.0346 | 0.0068 | 0.0207 | 0.0138 |
| 12 15 | 3 | 0.2616 | 0.2114 | 0.3599 | 0.0148 | 0.0334 | 0.0287 |
| 13 19 | 6 | 0.0074 | 0.0098 | 0.0135 | 0.0237 | 0.0765 | 0.8591 |
| 14 20 | 3 | 0.0434 | 0.2585 | 0.6477 | 0.0073 | 0.0106 | 0.0107 |
| 15 21 | 5 | 0.0150 | 0.0164 | 0.0172 | 0.0159 | 0.6673 | 0.2525 |
| 16 22 | 3 | 0.0259 | 0.1099 | 0.8307 | 0.0048 | 0.0072 | 0.0074 |
| 17 26 | 6 | 0.0071 | 0.0078 | 0.0097 | 0.0115 | 0.2495 | 0.7054 |
| 18 27 | 8 | 0.1116 | 0.1000 | 0.1071 | 0.1181 | 0.1123 | 0.1085 |
| 19 29 | 7 | 0.3138 | 0.0895 | 0.1208 | 0.0176 | 0.0402 | 0.0313 |
| 20 31 | 6 | 0.0063 | 0.0073 | 0.0091 | 0.0110 | 0.1828 | 0.7757 |
| 21 32 | 6 | 0.0093 | 0.0112 | 0.0164 | 0.0371 | 0.0927 | 0.8186 |
| 22 34 | 2 | 0.0239 | 0.8512 | 0.1064 | 0.0024 | 0.0046 | 0.0043 |
| 23 35 | 5 | 0.0766 | 0.0496 | 0.0464 | 0.0341 | 0.5650 | 0.1386 |
| 24 36 | 8 | 0.0676 | 0.0417 | 0.0630 | 0.0356 | 0.0564 | 0.0481 |
| 25 37 | 3 | 0.1668 | 0.3037 | 0.4289 | 0.0103 | 0.0191 | 0.0173 |
| 26 38 | 3 | 0.0198 | 0.1493 | 0.8005 | 0.0049 | 0.0071 | 0.0076 |
| 27 39 | 3 | 0.0840 | 0.1235 | 0.6295 | 0.0218 | 0.0322 | 0.0333 |
| 28 40 | 1 | 0.3961 | 0.3578 | 0.1028 | 0.0139 | 0.0358 | 0.0275 |
| 29 41 | 1 | 0.6930 | 0.0744 | 0.0684 | 0.0081 | 0.0238 | 0.0170 |
| 30 42 | 1 | 0.4150 | 0.4012 | 0.0905 | 0.0086 | 0.0229 | 0.0177 |
| 31 43 | 4 | 0.0074 | 0.0095 | 0.0140 | 0.8845 | 0.0226 | 0.0442 |
| 32 46 | 2 | 0.0498 | 0.5826 | 0.2908 | 0.0131 | 0.0184 | 0.0192 |
| 33 47 | 1 | 0.7158 | 0.0716 | 0.0436 | 0.0086 | 0.0237 | 0.0165 |
| 34 49 | 1 | 0.5062 | 0.1561 | 0.1713 | 0.0112 | 0.0268 | 0.0215 |
| 35 52 | 3 | 0.0628 | 0.2403 | 0.6413 | 0.0068 | 0.0120 | 0.0115 |
| 36 54 | 2 | 0.0468 | 0.7330 | 0.1608 | 0.0092 | 0.0147 | 0.0146 |
| 37 55 | 2 | 0.0354 | 0.8798 | 0.0599 | 0.0030 | 0.0068 | 0.0060 |
| 38 56 | 1 | 0.4181 | 0.1081 | 0.0750 | 0.0239 | 0.0688 | 0.0457 |
| 39 58 | 2 | 0.0421 | 0.7401 | 0.1640 | 0.0084 | 0.0133 | 0.0133 |
| 40 60 | 3 | 0.0182 | 0.0697 | 0.8760 | 0.0064 | 0.0077 | 0.0086 |
| 41 61 | 7 | 0.0933 | 0.0546 | 0.0615 | 0.0373 | 0.0539 | 0.0447 |
| 42 63 | 8 | 0.0139 | 0.0101 | 0.0143 | 0.0115 | 0.0115 | 0.0108 |
| 43 64 | 6 | 0.0033 | 0.0037 | 0.0048 | 0.0090 | 0.0722 | 0.9023 |
| 44 65 | 3 | 0.0575 | 0.1137 | 0.7291 | 0.0137 | 0.0224 | 0.0233 |

**Membership Matrix Section**

| Row | Cluster | Prob in 1 | Prob in 2 | Prob in 3 | Prob in 4 | Prob in 5 | Prob in 6 |
|---|---|---|---|---|---|---|---|
| 45 67 | 5 | 0.0148 | 0.0130 | 0.0128 | 0.0105 | 0.8464 | 0.0871 |
| 46 68 | 1 | 0.8296 | 0.0564 | 0.0402 | 0.0040 | 0.0107 | 0.0079 |
| 47 71 | 5 | 0.0250 | 0.0189 | 0.0220 | 0.0225 | 0.7234 | 0.1473 |
| 48 72 | 1 | 0.4404 | 0.0938 | 0.0666 | 0.0201 | 0.0571 | 0.0381 |
| 49 73 | 2 | 0.0414 | 0.8059 | 0.1073 | 0.0066 | 0.0117 | 0.0113 |
| 50 74 | 4 | 0.0813 | 0.1068 | 0.1258 | 0.2877 | 0.1073 | 0.1319 |
| 51 75 | 2 | 0.2939 | 0.3352 | 0.2627 | 0.0097 | 0.0200 | 0.0172 |
| 52 77 | 4 | 0.0496 | 0.0457 | 0.0661 | 0.2552 | 0.1488 | 0.1778 |
| 53 80 | 3 | 0.1842 | 0.1670 | 0.4424 | 0.0196 | 0.0368 | 0.0336 |
| 54 82 | 6 | 0.0139 | 0.0192 | 0.0245 | 0.0516 | 0.1180 | 0.7549 |
| 55 83 | 2 | 0.0357 | 0.5454 | 0.3844 | 0.0046 | 0.0084 | 0.0082 |
| 56 84 | 3 | 0.0746 | 0.1208 | 0.4093 | 0.1058 | 0.0680 | 0.0903 |
| 57 85 | 6 | 0.0138 | 0.0134 | 0.0171 | 0.0325 | 0.3618 | 0.5371 |
| 58 86 | 3 | 0.0353 | 0.1125 | 0.7384 | 0.0228 | 0.0268 | 0.0343 |
| 59 87 | 1 | 0.6170 | 0.1188 | 0.0638 | 0.0139 | 0.0407 | 0.0279 |
| 60 89 | 4 | 0.0197 | 0.0298 | 0.0435 | 0.7380 | 0.0462 | 0.0869 |
| 61 90 | 6 | 0.0080 | 0.0090 | 0.0105 | 0.0126 | 0.3534 | 0.5968 |
| 62 91 | 7 | 0.0252 | 0.0086 | 0.0097 | 0.0032 | 0.0065 | 0.0049 |
| 63 92 | 8 | 0.0531 | 0.0469 | 0.0626 | 0.1671 | 0.0968 | 0.1016 |
| 64 93 | 1 | 0.7181 | 0.0945 | 0.0485 | 0.0092 | 0.0278 | 0.0189 |
| 65 95 | 2 | 0.0446 | 0.8592 | 0.0656 | 0.0038 | 0.0077 | 0.0069 |
| 66 97 | 3 | 0.0440 | 0.1314 | 0.6737 | 0.0288 | 0.0372 | 0.0484 |
| 67 98 | 2 | 0.0287 | 0.7327 | 0.2042 | 0.0052 | 0.0085 | 0.0086 |
| 68 99 | 1 | 0.7904 | 0.0908 | 0.0490 | 0.0045 | 0.0112 | 0.0086 |
| 69 101 | 5 | 0.0331 | 0.0284 | 0.0358 | 0.0704 | 0.4406 | 0.3157 |
| 70 102 | 4 | 0.0260 | 0.0405 | 0.0580 | 0.6145 | 0.0703 | 0.1481 |
| 71 103 | 2 | 0.0492 | 0.6080 | 0.3033 | 0.0049 | 0.0098 | 0.0092 |
| 72 104 | 6 | 0.0164 | 0.0194 | 0.0212 | 0.0221 | 0.4486 | 0.4546 |
| 73 105 | 4 | 0.0124 | 0.0157 | 0.0230 | 0.8437 | 0.0276 | 0.0443 |
| 74 107 | 1 | 0.8256 | 0.0722 | 0.0370 | 0.0043 | 0.0141 | 0.0098 |
| 75 110 | 6 | 0.0178 | 0.0179 | 0.0251 | 0.0459 | 0.2583 | 0.6025 |
| 76 113 | 2 | 0.2135 | 0.5901 | 0.1304 | 0.0064 | 0.0163 | 0.0133 |
| 77 114 | 2 | 0.0769 | 0.4278 | 0.3270 | 0.0335 | 0.0400 | 0.0442 |
| 78 115 | 1 | 0.8064 | 0.0642 | 0.0407 | 0.0053 | 0.0188 | 0.0125 |
| 79 117 | 1 | 0.5041 | 0.3180 | 0.0973 | 0.0069 | 0.0187 | 0.0144 |
| 80 118 | 6 | 0.0064 | 0.0080 | 0.0109 | 0.0309 | 0.0686 | 0.8652 |
| 81 120 | 4 | 0.0218 | 0.0251 | 0.0377 | 0.5668 | 0.0921 | 0.1994 |
| 82 121 | 6 | 0.0088 | 0.0089 | 0.0113 | 0.0194 | 0.2848 | 0.6528 |
| 83 122 | 5 | 0.0107 | 0.0100 | 0.0101 | 0.0085 | 0.8613 | 0.0881 |
| 84 124 | 3 | 0.0937 | 0.2045 | 0.2600 | 0.1429 | 0.0834 | 0.1050 |
| 85 125 | 5 | 0.0180 | 0.0149 | 0.0146 | 0.0113 | 0.8380 | 0.0843 |
| 86 126 | 2 | 0.0367 | 0.7550 | 0.1607 | 0.0074 | 0.0120 | 0.0121 |
| 87 127 | 6 | 0.0254 | 0.0380 | 0.0491 | 0.1100 | 0.1481 | 0.5970 |
| 88 128 | 4 | 0.0250 | 0.0277 | 0.0391 | 0.6726 | 0.0599 | 0.0855 |

**Membership Matrix Section**

| Row | Cluster | Prob in 1 | Prob in 2 | Prob in 3 | Prob in 4 | Prob in 5 | Prob in 6 |
|---|---|---|---|---|---|---|---|
| 89 129 | 3 | 0.0651 | 0.2562 | 0.4950 | 0.0432 | 0.0386 | 0.0463 |
| 90 130 | 7 | 0.0589 | 0.0256 | 0.0292 | 0.0131 | 0.0246 | 0.0188 |
| 91 131 | 5 | 0.0740 | 0.0494 | 0.0604 | 0.0666 | 0.3562 | 0.1826 |
| 92 132 | 1 | 0.4454 | 0.3405 | 0.0923 | 0.0113 | 0.0303 | 0.0230 |
| 93 133 | 6 | 0.0048 | 0.0058 | 0.0072 | 0.0132 | 0.0917 | 0.8708 |
| 94 134 | 8 | 0.0472 | 0.0401 | 0.0525 | 0.0654 | 0.0482 | 0.0483 |
| 95 135 | 2 | 0.0618 | 0.7524 | 0.1510 | 0.0039 | 0.0085 | 0.0076 |
| 96 136 | 5 | 0.0286 | 0.0230 | 0.0258 | 0.0361 | 0.6443 | 0.1908 |
| 97 138 | 5 | 0.0144 | 0.0118 | 0.0134 | 0.0113 | 0.8192 | 0.1113 |
| 98 139 | 2 | 0.1851 | 0.6281 | 0.0993 | 0.0095 | 0.0232 | 0.0189 |
| 99 140 | 2 | 0.0281 | 0.8268 | 0.1242 | 0.0026 | 0.0051 | 0.0047 |
| 100 141 | 7 | 0.0360 | 0.0101 | 0.0107 | 0.0030 | 0.0064 | 0.0048 |
| 101 142 | 8 | 0.0158 | 0.0103 | 0.0143 | 0.0110 | 0.0139 | 0.0122 |
| 102 143 | 7 | 0.3551 | 0.0611 | 0.0489 | 0.0133 | 0.0348 | 0.0240 |
| 103 144 | 4 | 0.0423 | 0.0608 | 0.0818 | 0.5527 | 0.0723 | 0.1064 |
| 104 146 | 7 | 0.0990 | 0.0376 | 0.0496 | 0.0145 | 0.0302 | 0.0232 |
| 105 147 | 2 | 0.0509 | 0.6870 | 0.2091 | 0.0067 | 0.0150 | 0.0142 |
| 106 148 | 6 | 0.0039 | 0.0044 | 0.0057 | 0.0127 | 0.0715 | 0.8958 |
| 107 149 | 2 | 0.0197 | 0.8872 | 0.0771 | 0.0021 | 0.0040 | 0.0038 |
| 108 150 | 2 | 0.0720 | 0.7509 | 0.1095 | 0.0091 | 0.0177 | 0.0162 |
| 109 151 | 2 | 0.0475 | 0.8658 | 0.0586 | 0.0033 | 0.0074 | 0.0065 |
| 110 152 | 5 | 0.0097 | 0.0101 | 0.0108 | 0.0101 | 0.7728 | 0.1759 |
| 111 153 | 5 | 0.0079 | 0.0081 | 0.0091 | 0.0105 | 0.6870 | 0.2678 |
| 112 154 | 6 | 0.0144 | 0.0154 | 0.0210 | 0.0696 | 0.1757 | 0.6759 |
| 113 155 | 5 | 0.0132 | 0.0104 | 0.0114 | 0.0106 | 0.8513 | 0.0853 |
| 114 156 | 4 | 0.0237 | 0.0350 | 0.0526 | 0.5270 | 0.0848 | 0.2371 |
| 115 158 | 1 | 0.7552 | 0.0430 | 0.0347 | 0.0055 | 0.0151 | 0.0106 |
| 116 159 | 6 | 0.0098 | 0.0130 | 0.0164 | 0.0324 | 0.1041 | 0.8115 |
| 117 161 | 7 | 0.1303 | 0.0442 | 0.0417 | 0.0172 | 0.0404 | 0.0282 |
| 118 163 | 3 | 0.0357 | 0.0849 | 0.7901 | 0.0163 | 0.0182 | 0.0211 |
| 119 164 | 1 | 0.6438 | 0.1915 | 0.0857 | 0.0060 | 0.0148 | 0.0116 |
| 120 165 | 4 | 0.0221 | 0.0242 | 0.0346 | 0.6804 | 0.0640 | 0.0974 |
| 121 168 | 3 | 0.0310 | 0.1117 | 0.7868 | 0.0139 | 0.0144 | 0.0166 |
| 122 171 | 3 | 0.0261 | 0.1935 | 0.7310 | 0.0087 | 0.0118 | 0.0133 |
| 123 172 | 1 | 0.4534 | 0.1347 | 0.1709 | 0.0152 | 0.0405 | 0.0313 |

**Membership Matrix Section**

| Row | Cluster | Prob in 7 | Prob in 8 |
|---|---|---|---|
| 1 1 | 1 | 0.1113 | 0.0121 |
| 2 2 | 1 | 0.1273 | 0.0162 |
| 3 3 | 3 | 0.0080 | 0.0053 |
| 4 4 | 2 | 0.0170 | 0.0058 |
| 5 6 | 6 | 0.0050 | 0.0043 |
| 6 7 | 1 | 0.0448 | 0.0065 |
| 7 10 | 1 | 0.0381 | 0.0101 |
| 8 11 | 7 | 0.9385 | 0.0114 |
| 9 12 | 2 | 0.0081 | 0.0032 |
| 10 13 | 1 | 0.1253 | 0.0226 |
| 11 14 | 1 | 0.1528 | 0.0152 |
| 12 15 | 3 | 0.0676 | 0.0226 |
| 13 19 | 6 | 0.0050 | 0.0050 |
| 14 20 | 3 | 0.0146 | 0.0072 |
| 15 21 | 5 | 0.0089 | 0.0068 |
| 16 22 | 3 | 0.0093 | 0.0048 |
| 17 26 | 6 | 0.0047 | 0.0042 |
| 18 27 | 8 | 0.1419 | 0.2005 |
| 19 29 | 7 | 0.3330 | 0.0538 |
| 20 31 | 6 | 0.0041 | 0.0037 |
| 21 32 | 6 | 0.0069 | 0.0078 |
| 22 34 | 2 | 0.0052 | 0.0022 |
| 23 35 | 5 | 0.0566 | 0.0331 |
| 24 36 | 8 | 0.1810 | 0.5066 |
| 25 37 | 3 | 0.0398 | 0.0142 |
| 26 38 | 3 | 0.0070 | 0.0039 |
| 27 39 | 3 | 0.0470 | 0.0286 |
| 28 40 | 1 | 0.0506 | 0.0155 |
| 29 41 | 1 | 0.0989 | 0.0164 |
| 30 42 | 1 | 0.0342 | 0.0100 |
| 31 43 | 4 | 0.0067 | 0.0112 |
| 32 46 | 2 | 0.0169 | 0.0092 |
| 33 47 | 1 | 0.1044 | 0.0158 |
| 34 49 | 1 | 0.0865 | 0.0203 |
| 35 52 | 3 | 0.0176 | 0.0077 |
| 36 54 | 2 | 0.0139 | 0.0069 |
| 37 55 | 2 | 0.0065 | 0.0027 |
| 38 56 | 1 | 0.2176 | 0.0427 |
| 39 58 | 2 | 0.0125 | 0.0063 |
| 40 60 | 3 | 0.0082 | 0.0052 |
| 41 61 | 7 | 0.3297 | 0.3250 |
| 42 63 | 8 | 0.0341 | 0.8938 |
| 43 64 | 6 | 0.0024 | 0.0025 |
| 44 65 | 3 | 0.0256 | 0.0147 |

**Membership Matrix Section**

| Row | Cluster | Prob in 7 | Prob in 8 |
|---|---|---|---|
| 45 67 | 5 | 0.0091 | 0.0063 |
| 46 68 | 1 | 0.0437 | 0.0074 |
| 47 71 | 5 | 0.0219 | 0.0189 |
| 48 72 | 1 | 0.2447 | 0.0393 |
| 49 73 | 2 | 0.0108 | 0.0051 |
| 50 74 | 4 | 0.0706 | 0.0887 |
| 51 75 | 2 | 0.0470 | 0.0141 |
| 52 77 | 4 | 0.0632 | 0.1937 |
| 53 80 | 3 | 0.0829 | 0.0335 |
| 54 82 | 6 | 0.0091 | 0.0089 |
| 55 83 | 2 | 0.0091 | 0.0042 |
| 56 84 | 3 | 0.0592 | 0.0720 |
| 57 85 | 6 | 0.0115 | 0.0128 |
| 58 86 | 3 | 0.0171 | 0.0127 |
| 59 87 | 1 | 0.0972 | 0.0207 |
| 60 89 | 4 | 0.0154 | 0.0205 |
| 61 90 | 6 | 0.0052 | 0.0045 |
| 62 91 | 7 | 0.9223 | 0.0195 |
| 63 92 | 8 | 0.0786 | 0.3933 |
| 64 93 | 1 | 0.0691 | 0.0139 |
| 65 95 | 2 | 0.0086 | 0.0035 |
| 66 97 | 3 | 0.0209 | 0.0155 |
| 67 98 | 2 | 0.0081 | 0.0040 |
| 68 99 | 1 | 0.0381 | 0.0075 |
| 69 101 | 5 | 0.0332 | 0.0428 |
| 70 102 | 4 | 0.0192 | 0.0234 |
| 71 103 | 2 | 0.0109 | 0.0047 |
| 72 104 | 6 | 0.0098 | 0.0078 |
| 73 105 | 4 | 0.0117 | 0.0216 |
| 74 107 | 1 | 0.0304 | 0.0065 |
| 75 110 | 6 | 0.0149 | 0.0176 |
| 76 113 | 2 | 0.0226 | 0.0073 |
| 77 114 | 2 | 0.0313 | 0.0193 |
| 78 115 | 1 | 0.0435 | 0.0086 |
| 79 117 | 1 | 0.0319 | 0.0087 |
| 80 118 | 6 | 0.0047 | 0.0052 |
| 81 120 | 4 | 0.0206 | 0.0366 |
| 82 121 | 6 | 0.0069 | 0.0071 |
| 83 122 | 5 | 0.0066 | 0.0047 |
| 84 124 | 3 | 0.0585 | 0.0520 |
| 85 125 | 5 | 0.0113 | 0.0075 |
| 86 126 | 2 | 0.0107 | 0.0054 |
| 87 127 | 6 | 0.0163 | 0.0161 |
| 88 128 | 4 | 0.0269 | 0.0633 |

**Membership Matrix Section**

| Row | Cluster | Prob in 7 | Prob in 8 |
|---|---|---|---|
| 89 129 | 3 | 0.0322 | 0.0234 |
| 90 130 | 7 | 0.7154 | 0.1144 |
| 91 131 | 5 | 0.0972 | 0.1136 |
| 92 132 | 1 | 0.0443 | 0.0130 |
| 93 133 | 6 | 0.0033 | 0.0032 |
| 94 134 | 8 | 0.0827 | 0.6157 |
| 95 135 | 2 | 0.0106 | 0.0041 |
| 96 136 | 5 | 0.0261 | 0.0252 |
| 97 138 | 5 | 0.0105 | 0.0081 |
| 98 139 | 2 | 0.0265 | 0.0093 |
| 99 140 | 2 | 0.0060 | 0.0025 |
| 100 141 | 7 | 0.9151 | 0.0139 |
| 101 142 | 8 | 0.0461 | 0.8764 |
| 102 143 | 7 | 0.4282 | 0.0346 |
| 103 144 | 4 | 0.0352 | 0.0484 |
| 104 146 | 7 | 0.6555 | 0.0903 |
| 105 147 | 2 | 0.0117 | 0.0054 |
| 106 148 | 6 | 0.0029 | 0.0031 |
| 107 149 | 2 | 0.0043 | 0.0018 |
| 108 150 | 2 | 0.0171 | 0.0075 |
| 109 151 | 2 | 0.0079 | 0.0031 |
| 110 152 | 5 | 0.0060 | 0.0046 |
| 111 153 | 5 | 0.0053 | 0.0044 |
| 112 154 | 6 | 0.0122 | 0.0157 |
| 113 155 | 5 | 0.0101 | 0.0078 |
| 114 156 | 4 | 0.0177 | 0.0222 |
| 115 158 | 1 | 0.1233 | 0.0126 |
| 116 159 | 6 | 0.0065 | 0.0063 |
| 117 161 | 7 | 0.6330 | 0.0650 |
| 118 163 | 3 | 0.0195 | 0.0143 |
| 119 164 | 1 | 0.0376 | 0.0089 |
| 120 165 | 4 | 0.0236 | 0.0537 |
| 121 168 | 3 | 0.0152 | 0.0105 |
| 122 171 | 3 | 0.0098 | 0.0059 |
| 123 172 | 1 | 0.1244 | 0.0296 |

**Cluster Medoids Section**

| Variable | Cluster1 | Cluster2 | Cluster3 | Cluster4 | Cluster5 | Cluster6 |
|---|---|---|---|---|---|---|
| Factor1 | -0.8839 | -0.6203 | 0.4986 | 0.1124 | 1.0082 | -0.4908 |
| Factor2 | -1.3572 | -0.5606 | -0.8558 | -0.5152 | 2.2898 | 1.2297 |
| Factor3 | -1.0036 | 1.06 | -0.3941 | 0.4501 | 0.3485 | -0.6199 |
| Row | 10 13 | 49 73 | 46 68 | 95 135 | 31 43 | 43 64 |

**Cluster Medoids Section**

| Variable | Cluster7 | Cluster8 | Cluster9 |
|---|---|---|---|
| Factor1 | -1.371 | 2.2997 | 1.0327 |
| Factor2 | 0.7289 | -1.0495 | -0.14 |
| Factor3 | -1.0087 | -1.6501 | 1.0032 |
| Row | 83 122 | 62 91 | 40 60 |

**Membership Summary Section for Clusters = 9**

<table>
<tr><th>Row</th><th>Cluster</th><th>Cluster Membership</th><th>Sum of Squared Memberships</th><th>Bar of Squared Memberships</th><th>Silhouette Amount</th><th>Silhouette Bar</th></tr>
<tr><td>10 13</td><td>1</td><td>0.9069</td><td>0.8246</td><td>|IIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.5692</td><td>|IIIIIIIIIIIIIIIII</td></tr>
<tr><td>33 47</td><td>1</td><td>0.8441</td><td>0.7199</td><td>|IIIIIIIIIIIIIIIIIIIIII</td><td>0.3735</td><td>|IIIIIIIIIII</td></tr>
<tr><td>59 87</td><td>1</td><td>0.8305</td><td>0.6962</td><td>|IIIIIIIIIIIIIIIIIIIII</td><td>0.4813</td><td>|IIIIIIIIIIIIII</td></tr>
<tr><td>64 93</td><td>1</td><td>0.8024</td><td>0.6544</td><td>|IIIIIIIIIIIIIIIIIIII</td><td>0.3265</td><td>|IIIIIIIIII</td></tr>
<tr><td>48 72</td><td>1</td><td>0.7759</td><td>0.6117</td><td>|IIIIIIIIIIIIIIIIII</td><td>0.5729</td><td>|IIIIIIIIIIIIIIIII</td></tr>
<tr><td>38 56</td><td>1</td><td>0.7296</td><td>0.5453</td><td>|IIIIIIIIIIIIIIII</td><td>0.5647</td><td>|IIIIIIIIIIIIIIIII</td></tr>
<tr><td>102 143</td><td>1</td><td>0.5489</td><td>0.3495</td><td>|IIIIIIIIII</td><td>0.2708</td><td>|IIIIIIII</td></tr>
<tr><td>49 73</td><td>2</td><td>0.8612</td><td>0.7487</td><td>|IIIIIIIIIIIIIIIIIIIIII</td><td>0.4351</td><td>|IIIIIIIIIIIII</td></tr>
<tr><td>86 126</td><td>2</td><td>0.8611</td><td>0.7485</td><td>|IIIIIIIIIIIIIIIIIIIIII</td><td>0.4114</td><td>|IIIIIIIIIIII</td></tr>
<tr><td>39 58</td><td>2</td><td>0.8600</td><td>0.7463</td><td>|IIIIIIIIIIIIIIIIIIIIII</td><td>0.4419</td><td>|IIIIIIIIIIIII</td></tr>
<tr><td>36 54</td><td>2</td><td>0.8471</td><td>0.7253</td><td>|IIIIIIIIIIIIIIIIIIIIII</td><td>0.4540</td><td>|IIIIIIIIIIIIII</td></tr>
<tr><td>108 150</td><td>2</td><td>0.7231</td><td>0.5479</td><td>|IIIIIIIIIIIIIIII</td><td>0.3811</td><td>|IIIIIIIIIII</td></tr>
<tr><td>32 46</td><td>2</td><td>0.6871</td><td>0.5030</td><td>|IIIIIIIIIIIIIII</td><td>0.3528</td><td>|IIIIIIIIIII</td></tr>
<tr><td>65 95</td><td>2</td><td>0.6760</td><td>0.5073</td><td>|IIIIIIIIIIIIIII</td><td>0.1925</td><td>|IIIIII</td></tr>
<tr><td>67 98</td><td>2</td><td>0.6685</td><td>0.4955</td><td>|IIIIIIIIIIIIIII</td><td>0.1414</td><td>|IIII</td></tr>
<tr><td>37 55</td><td>2</td><td>0.5189</td><td>0.4045</td><td>|IIIIIIIIIIII</td><td>-0.0512</td><td>|</td></tr>
<tr><td>77 114</td><td>2</td><td>0.4853</td><td>0.3013</td><td>|IIIIIIIII</td><td>0.3104</td><td>|IIIIIIIII</td></tr>
<tr><td>109 151</td><td>2</td><td>0.4771</td><td>0.3820</td><td>|IIIIIIIIIII</td><td>-0.0523</td><td>|</td></tr>
<tr><td>98 139</td><td>2</td><td>0.3877</td><td>0.2661</td><td>|IIIIIIII</td><td>-0.0001</td><td>|</td></tr>
<tr><td>28 40</td><td>2</td><td>0.2299</td><td>0.1885</td><td>|IIIIII</td><td>-0.0852</td><td>|</td></tr>
<tr><td>46 68</td><td>3</td><td>0.8663</td><td>0.7544</td><td>|IIIIIIIIIIIIIIIIIIIIIII</td><td>0.4807</td><td>|IIIIIIIIIIIIII</td></tr>
<tr><td>29 41</td><td>3</td><td>0.8138</td><td>0.6688</td><td>|IIIIIIIIIIIIIIIIIIII</td><td>0.5027</td><td>|IIIIIIIIIIIIIII</td></tr>
<tr><td>2 2</td><td>3</td><td>0.7955</td><td>0.6411</td><td>|IIIIIIIIIIIIIIIIIII</td><td>0.5226</td><td>|IIIIIIIIIIIIIIII</td></tr>
<tr><td>115 158</td><td>3</td><td>0.6951</td><td>0.5097</td><td>|IIIIIIIIIIIIIII</td><td>0.4621</td><td>|IIIIIIIIIIIIII</td></tr>
<tr><td>78 115</td><td>3</td><td>0.6810</td><td>0.4875</td><td>|IIIIIIIIIIIIIII</td><td>0.4087</td><td>|IIIIIIIIIIII</td></tr>
<tr><td>68 99</td><td>3</td><td>0.6786</td><td>0.4853</td><td>|IIIIIIIIIIIIIII</td><td>0.2926</td><td>|IIIIIIIII</td></tr>
<tr><td>34 49</td><td>3</td><td>0.6588</td><td>0.4623</td><td>|IIIIIIIIIIIIII</td><td>0.2739</td><td>|IIIIIIII</td></tr>
<tr><td>74 107</td><td>3</td><td>0.6314</td><td>0.4322</td><td>|IIIIIIIIIIIII</td><td>0.3141</td><td>|IIIIIIIII</td></tr>
<tr><td>123 172</td><td>3</td><td>0.6212</td><td>0.4132</td><td>|IIIIIIIIIIII</td><td>0.3377</td><td>|IIIIIIIIII</td></tr>
<tr><td>1 1</td><td>3</td><td>0.5962</td><td>0.4102</td><td>|IIIIIIIIIIII</td><td>0.3583</td><td>|IIIIIIIIIII</td></tr>
<tr><td>119 164</td><td>3</td><td>0.5455</td><td>0.3604</td><td>|IIIIIIIIIII</td><td>0.0186</td><td>|I</td></tr>
<tr><td>6 7</td><td>3</td><td>0.5056</td><td>0.3741</td><td>|IIIIIIIIIII</td><td>0.2643</td><td>|IIIIIIII</td></tr>
<tr><td>19 29</td><td>3</td><td>0.4575</td><td>0.2646</td><td>|IIIIIIII</td><td>0.3795</td><td>|IIIIIIIIIII</td></tr>
<tr><td>11 14</td><td>3</td><td>0.4126</td><td>0.3295</td><td>|IIIIIIIIII</td><td>0.1549</td><td>|IIIII</td></tr>
<tr><td>12 15</td><td>3</td><td>0.3354</td><td>0.2399</td><td>|IIIIIII</td><td>-0.0459</td><td>|</td></tr>
</table>

**Membership Summary Section for Clusters = 9**

<table>
<tr><th>Row</th><th>Cluster</th><th>Cluster Membership</th><th>Sum of Squared Memberships</th><th>Bar of Squared Memberships</th><th>Silhouette Amount</th><th>Silhouette Bar</th></tr>
<tr><td>7 10</td><td>3</td><td>0.3125</td><td>0.2128</td><td>|||||||</td><td>-0.1109</td><td>|</td></tr>
<tr><td>95 135</td><td>4</td><td>0.8429</td><td>0.7187</td><td>|||||||||||||||||||||||</td><td>0.4718</td><td>|||||||||||||||</td></tr>
<tr><td>9 12</td><td>4</td><td>0.8193</td><td>0.6843</td><td>||||||||||||||||||||||</td><td>0.4374</td><td>||||||||||||||</td></tr>
<tr><td>71 103</td><td>4</td><td>0.7746</td><td>0.6168</td><td>||||||||||||||||||||</td><td>0.4269</td><td>||||||||||||||</td></tr>
<tr><td>99 140</td><td>4</td><td>0.7523</td><td>0.5957</td><td>|||||||||||||||||||</td><td>0.3365</td><td>|||||||||||</td></tr>
<tr><td>22 34</td><td>4</td><td>0.6800</td><td>0.5187</td><td>|||||||||||||||||</td><td>0.2832</td><td>|||||||||</td></tr>
<tr><td>55 83</td><td>4</td><td>0.6436</td><td>0.4613</td><td>|||||||||||||||</td><td>0.3205</td><td>|||||||||||</td></tr>
<tr><td>76 113</td><td>4</td><td>0.6162</td><td>0.4203</td><td>||||||||||||||</td><td>0.4366</td><td>||||||||||||||</td></tr>
<tr><td>107 149</td><td>4</td><td>0.5632</td><td>0.4395</td><td>||||||||||||||</td><td>0.1557</td><td>||||||</td></tr>
<tr><td>105 147</td><td>4</td><td>0.5241</td><td>0.3645</td><td>||||||||||||</td><td>0.1967</td><td>|||||||</td></tr>
<tr><td>35 52</td><td>4</td><td>0.5006</td><td>0.3410</td><td>|||||||||||</td><td>0.2777</td><td>|||||||||</td></tr>
<tr><td>25 37</td><td>4</td><td>0.4841</td><td>0.3018</td><td>||||||||||</td><td>0.3009</td><td>||||||||||</td></tr>
<tr><td>51 75</td><td>4</td><td>0.4434</td><td>0.2923</td><td>||||||||||</td><td>0.2080</td><td>|||||||</td></tr>
<tr><td>4 4</td><td>4</td><td>0.4263</td><td>0.3103</td><td>||||||||||</td><td>0.1524</td><td>||||||</td></tr>
<tr><td>79 117</td><td>4</td><td>0.3590</td><td>0.2759</td><td>|||||||||</td><td>0.1578</td><td>||||||</td></tr>
<tr><td>30 42</td><td>4</td><td>0.3093</td><td>0.2152</td><td>|||||||</td><td>0.1877</td><td>|||||||</td></tr>
<tr><td>92 132</td><td>4</td><td>0.2390</td><td>0.1927</td><td>|||||||</td><td>0.0600</td><td>|||</td></tr>
<tr><td>31 43</td><td>5</td><td>0.8739</td><td>0.7669</td><td>||||||||||||||||||||||||</td><td>0.0549</td><td>|||</td></tr>
<tr><td>73 105</td><td>5</td><td>0.8372</td><td>0.7051</td><td>||||||||||||||||||||||</td><td>0.2734</td><td>|||||||||</td></tr>
<tr><td>120 165</td><td>5</td><td>0.7738</td><td>0.6078</td><td>|||||||||||||||||||</td><td>0.1065</td><td>||||</td></tr>
<tr><td>88 128</td><td>5</td><td>0.7535</td><td>0.5773</td><td>||||||||||||||||||</td><td>0.2253</td><td>||||||||</td></tr>
<tr><td>81 120</td><td>5</td><td>0.6082</td><td>0.4101</td><td>|||||||||||||</td><td>-0.2991</td><td>|</td></tr>
<tr><td>60 89</td><td>5</td><td>0.6028</td><td>0.3902</td><td>|||||||||||||</td><td>0.0365</td><td>||</td></tr>
<tr><td>70 102</td><td>5</td><td>0.4734</td><td>0.2775</td><td>|||||||||</td><td>-0.1770</td><td>|</td></tr>
<tr><td>103 144</td><td>5</td><td>0.4564</td><td>0.2503</td><td>|||||||||</td><td>0.2214</td><td>||||||||</td></tr>
<tr><td>114 156</td><td>5</td><td>0.4210</td><td>0.2675</td><td>|||||||||</td><td>-0.3827</td><td>|</td></tr>
<tr><td>52 77</td><td>5</td><td>0.3313</td><td>0.1841</td><td>|||||||</td><td>-0.2059</td><td>|</td></tr>
<tr><td>63 92</td><td>5</td><td>0.2634</td><td>0.1453</td><td>|||||</td><td>-0.0048</td><td>|</td></tr>
<tr><td>50 74</td><td>5</td><td>0.2410</td><td>0.1336</td><td>|||||</td><td>0.1669</td><td>||||||</td></tr>
<tr><td>43 64</td><td>6</td><td>0.8962</td><td>0.8089</td><td>|||||||||||||||||||||||||</td><td>0.5802</td><td>||||||||||||||||||</td></tr>
<tr><td>106 148</td><td>6</td><td>0.8914</td><td>0.8001</td><td>|||||||||||||||||||||||||</td><td>0.5876</td><td>|||||||||||||||||||</td></tr>
<tr><td>80 118</td><td>6</td><td>0.8619</td><td>0.7485</td><td>|||||||||||||||||||||||</td><td>0.6075</td><td>|||||||||||||||||||</td></tr>
<tr><td>93 133</td><td>6</td><td>0.8617</td><td>0.7518</td><td>||||||||||||||||||||||||</td><td>0.5587</td><td>||||||||||||||||||</td></tr>
<tr><td>13 19</td><td>6</td><td>0.8502</td><td>0.7297</td><td>|||||||||||||||||||||||</td><td>0.5924</td><td>|||||||||||||||||||</td></tr>
<tr><td>21 32</td><td>6</td><td>0.8102</td><td>0.6668</td><td>|||||||||||||||||||||</td><td>0.5690</td><td>||||||||||||||||||</td></tr>
<tr><td>116 159</td><td>6</td><td>0.8002</td><td>0.6529</td><td>|||||||||||||||||||||</td><td>0.5575</td><td>||||||||||||||||||</td></tr>
<tr><td>20 31</td><td>6</td><td>0.7528</td><td>0.6055</td><td>|||||||||||||||||||</td><td>0.4652</td><td>|||||||||||||||</td></tr>
<tr><td>54 82</td><td>6</td><td>0.7417</td><td>0.5676</td><td>||||||||||||||||||</td><td>0.5399</td><td>|||||||||||||||||</td></tr>
<tr><td>17 26</td><td>6</td><td>0.6790</td><td>0.5321</td><td>|||||||||||||||||</td><td>0.4118</td><td>|||||||||||||</td></tr>
<tr><td>112 154</td><td>6</td><td>0.6640</td><td>0.4778</td><td>|||||||||||||||</td><td>0.4496</td><td>||||||||||||||</td></tr>
<tr><td>82 121</td><td>6</td><td>0.6336</td><td>0.4890</td><td>||||||||||||||||</td><td>0.3710</td><td>||||||||||||</td></tr>
<tr><td>5 6</td><td>6</td><td>0.5875</td><td>0.4714</td><td>|||||||||||||||</td><td>0.3455</td><td>|||||||||||</td></tr>
</table>

**Membership Summary Section for Clusters = 9**

<table>
<tr><th>Row</th><th>Cluster</th><th>Cluster Membership</th><th>Sum of Squared Memberships</th><th>Bar of Squared Memberships</th><th>Silhouette Amount</th><th>Silhouette Bar</th></tr>
<tr><td>75 110</td><td>6</td><td>0.5850</td><td>0.4134</td><td>|IIIIIIIIIIII</td><td>0.3562</td><td>|IIIIIIIIIII</td></tr>
<tr><td>87 127</td><td>6</td><td>0.5796</td><td>0.3718</td><td>|IIIIIIIIIII</td><td>0.4728</td><td>|IIIIIIIIIIIIII</td></tr>
<tr><td>61 90</td><td>6</td><td>0.5648</td><td>0.4600</td><td>|IIIIIIIIIIIIII</td><td>0.3239</td><td>|IIIIIIIIII</td></tr>
<tr><td>57 85</td><td>6</td><td>0.5194</td><td>0.4063</td><td>|IIIIIIIIIIII</td><td>0.2606</td><td>|IIIIIIII</td></tr>
<tr><td>83 122</td><td>7</td><td>0.8499</td><td>0.7303</td><td>|IIIIIIIIIIIIIIIIIIIIII</td><td>0.3148</td><td>|IIIIIIIII</td></tr>
<tr><td>113 155</td><td>7</td><td>0.8363</td><td>0.7075</td><td>|IIIIIIIIIIIIIIIIIIIII</td><td>0.3898</td><td>|IIIIIIIIIIII</td></tr>
<tr><td>45 67</td><td>7</td><td>0.8278</td><td>0.6937</td><td>|IIIIIIIIIIIIIIIIIIIII</td><td>0.3688</td><td>|IIIIIIIIIII</td></tr>
<tr><td>85 125</td><td>7</td><td>0.8143</td><td>0.6718</td><td>|IIIIIIIIIIIIIIIIIIII</td><td>0.4024</td><td>|IIIIIIIIIIII</td></tr>
<tr><td>97 138</td><td>7</td><td>0.8056</td><td>0.6619</td><td>|IIIIIIIIIIIIIIIIIIII</td><td>0.2819</td><td>|IIIIIIII</td></tr>
<tr><td>110 152</td><td>7</td><td>0.7751</td><td>0.6280</td><td>|IIIIIIIIIIIIIIIIIII</td><td>0.0725</td><td>|II</td></tr>
<tr><td>47 71</td><td>7</td><td>0.7044</td><td>0.5201</td><td>|IIIIIIIIIIIIIIII</td><td>0.3158</td><td>|IIIIIIIII</td></tr>
<tr><td>111 153</td><td>7</td><td>0.7021</td><td>0.5534</td><td>|IIIIIIIIIIIIIIIII</td><td>-0.1061</td><td>|</td></tr>
<tr><td>15 21</td><td>7</td><td>0.6656</td><td>0.5005</td><td>|IIIIIIIIIIIIIII</td><td>-0.0096</td><td>|</td></tr>
<tr><td>96 136</td><td>7</td><td>0.6268</td><td>0.4323</td><td>|IIIIIIIIIIIII</td><td>0.2823</td><td>|IIIIIIII</td></tr>
<tr><td>23 35</td><td>7</td><td>0.5123</td><td>0.2989</td><td>|IIIIIIIII</td><td>0.3797</td><td>|IIIIIIIIIII</td></tr>
<tr><td>72 104</td><td>7</td><td>0.4541</td><td>0.3919</td><td>|IIIIIIIIIIII</td><td>-0.2569</td><td>|</td></tr>
<tr><td>69 101</td><td>7</td><td>0.4318</td><td>0.2907</td><td>|IIIIIIIII</td><td>-0.0054</td><td>|</td></tr>
<tr><td>91 131</td><td>7</td><td>0.3435</td><td>0.1848</td><td>|IIIIII</td><td>0.2005</td><td>|IIIIII</td></tr>
<tr><td>62 91</td><td>8</td><td>0.8783</td><td>0.7743</td><td>|IIIIIIIIIIIIIIIIIIIIIII</td><td>-0.3709</td><td>|</td></tr>
<tr><td>90 130</td><td>8</td><td>0.8368</td><td>0.7045</td><td>|IIIIIIIIIIIIIIIIIIIII</td><td>-0.1382</td><td>|</td></tr>
<tr><td>8 11</td><td>8</td><td>0.7951</td><td>0.6411</td><td>|IIIIIIIIIIIIIIIIIII</td><td>-0.4541</td><td>|</td></tr>
<tr><td>100 141</td><td>8</td><td>0.7247</td><td>0.5419</td><td>|IIIIIIIIIIIIIIII</td><td>-0.5002</td><td>|</td></tr>
<tr><td>104 146</td><td>8</td><td>0.6641</td><td>0.4628</td><td>|IIIIIIIIIIIIII</td><td>-0.4848</td><td>|</td></tr>
<tr><td>101 142</td><td>8</td><td>0.5087</td><td>0.2901</td><td>|IIIIIIIII</td><td>0.0212</td><td>|I</td></tr>
<tr><td>41 61</td><td>8</td><td>0.5087</td><td>0.2922</td><td>|IIIIIIIII</td><td>0.1112</td><td>|III</td></tr>
<tr><td>24 36</td><td>8</td><td>0.4525</td><td>0.2452</td><td>|IIIIIII</td><td>-0.2607</td><td>|</td></tr>
<tr><td>117 161</td><td>8</td><td>0.4237</td><td>0.2498</td><td>|IIIIIII</td><td>-0.4592</td><td>|</td></tr>
<tr><td>42 63</td><td>8</td><td>0.4222</td><td>0.2212</td><td>|IIIIIII</td><td>0.0744</td><td>|II</td></tr>
<tr><td>94 134</td><td>8</td><td>0.2413</td><td>0.1331</td><td>|IIII</td><td>0.1526</td><td>|IIIII</td></tr>
<tr><td>18 27</td><td>8</td><td>0.1517</td><td>0.1133</td><td>|III</td><td>0.1398</td><td>|IIII</td></tr>
<tr><td>40 60</td><td>9</td><td>0.8524</td><td>0.7328</td><td>|IIIIIIIIIIIIIIIIIIIIII</td><td>0.3389</td><td>|IIIIIIIIII</td></tr>
<tr><td>3 3</td><td>9</td><td>0.8426</td><td>0.7171</td><td>|IIIIIIIIIIIIIIIIIIIIII</td><td>0.3261</td><td>|IIIIIIIIII</td></tr>
<tr><td>118 163</td><td>9</td><td>0.7887</td><td>0.6316</td><td>|IIIIIIIIIIIIIIIIIII</td><td>0.3784</td><td>|IIIIIIIIIII</td></tr>
<tr><td>58 86</td><td>9</td><td>0.7538</td><td>0.5812</td><td>|IIIIIIIIIIIIIIIII</td><td>0.3518</td><td>|IIIIIIIIIII</td></tr>
<tr><td>121 168</td><td>9</td><td>0.7527</td><td>0.5822</td><td>|IIIIIIIIIIIIIIIII</td><td>0.3636</td><td>|IIIIIIIIIII</td></tr>
<tr><td>66 97</td><td>9</td><td>0.6700</td><td>0.4710</td><td>|IIIIIIIIIIIIII</td><td>0.2967</td><td>|IIIIIIIII</td></tr>
<tr><td>26 38</td><td>9</td><td>0.6183</td><td>0.4368</td><td>|IIIIIIIIIIIII</td><td>0.0359</td><td>|I</td></tr>
<tr><td>16 22</td><td>9</td><td>0.5980</td><td>0.4210</td><td>|IIIIIIIIIIIII</td><td>-0.0099</td><td>|</td></tr>
<tr><td>44 65</td><td>9</td><td>0.5908</td><td>0.3919</td><td>|IIIIIIIIIIII</td><td>0.1338</td><td>|IIII</td></tr>
<tr><td>122 171</td><td>9</td><td>0.5874</td><td>0.4043</td><td>|IIIIIIIIIIII</td><td>0.1277</td><td>|IIII</td></tr>
<tr><td>27 39</td><td>9</td><td>0.5069</td><td>0.3086</td><td>|IIIIIIIII</td><td>0.1733</td><td>|IIIII</td></tr>
<tr><td>56 84</td><td>9</td><td>0.4256</td><td>0.2272</td><td>|IIIIIII</td><td>0.3404</td><td>|IIIIIIIIII</td></tr>
</table>

**Membership Summary Section for Clusters = 9**

| Row | Cluster | Cluster Membership | Sum of Squared Memberships | Bar of Squared Memberships | Silhouette Amount | Silhouette Bar |
|---|---|---|---|---|---|---|
| 89 129 | 9 | 0.3897 | 0.2498 | \|IIIIIII | 0.0884 | \|III |
| 14 20 | 9 | 0.3731 | 0.2893 | \|IIIIIIIII | -0.1614 | \| |
| 53 80 | 9 | 0.2597 | 0.2025 | \|IIIIII | -0.1468 | \| |
| 84 124 | 9 | 0.2212 | 0.1437 | \|IIII | 0.0287 | \|I |

**Membership Matrix Section**

| Row | Cluster | Prob in 1 | Prob in 2 | Prob in 3 | Prob in 4 | Prob in 5 | Prob in 6 |
|---|---|---|---|---|---|---|---|
| 1 1 | 3 | 0.2180 | 0.0315 | 0.5962 | 0.0569 | 0.0048 | 0.0089 |
| 2 2 | 3 | 0.0609 | 0.0222 | 0.7955 | 0.0484 | 0.0035 | 0.0064 |
| 3 3 | 9 | 0.0057 | 0.0510 | 0.0144 | 0.0645 | 0.0045 | 0.0070 |
| 4 4 | 4 | 0.0454 | 0.3358 | 0.1032 | 0.4263 | 0.0048 | 0.0100 |
| 5 6 | 6 | 0.0056 | 0.0081 | 0.0082 | 0.0094 | 0.0115 | 0.5875 |
| 6 7 | 3 | 0.3365 | 0.0301 | 0.5056 | 0.0536 | 0.0042 | 0.0088 |
| 7 10 | 3 | 0.2068 | 0.1408 | 0.3125 | 0.2205 | 0.0075 | 0.0164 |
| 8 11 | 8 | 0.0537 | 0.0149 | 0.0684 | 0.0227 | 0.0060 | 0.0094 |
| 9 12 | 4 | 0.0073 | 0.1069 | 0.0250 | 0.8193 | 0.0014 | 0.0027 |
| 10 13 | 1 | 0.9069 | 0.0113 | 0.0385 | 0.0146 | 0.0020 | 0.0040 |
| 11 14 | 3 | 0.3890 | 0.0299 | 0.4126 | 0.0506 | 0.0059 | 0.0117 |
| 12 15 | 3 | 0.0422 | 0.0818 | 0.3354 | 0.3038 | 0.0092 | 0.0178 |
| 13 19 | 6 | 0.0051 | 0.0092 | 0.0080 | 0.0105 | 0.0214 | 0.8502 |
| 14 20 | 9 | 0.0172 | 0.1915 | 0.0495 | 0.3321 | 0.0063 | 0.0097 |
| 15 21 | 7 | 0.0112 | 0.0150 | 0.0151 | 0.0170 | 0.0149 | 0.2366 |
| 16 22 | 9 | 0.0119 | 0.0894 | 0.0394 | 0.2313 | 0.0051 | 0.0082 |
| 17 26 | 6 | 0.0051 | 0.0074 | 0.0078 | 0.0088 | 0.0113 | 0.6790 |
| 18 27 | 8 | 0.1078 | 0.0947 | 0.1104 | 0.1010 | 0.1179 | 0.1044 |
| 19 29 | 3 | 0.0810 | 0.0495 | 0.4575 | 0.1031 | 0.0132 | 0.0227 |
| 20 31 | 6 | 0.0047 | 0.0070 | 0.0070 | 0.0083 | 0.0108 | 0.7528 |
| 21 32 | 6 | 0.0063 | 0.0103 | 0.0101 | 0.0123 | 0.0348 | 0.8102 |
| 22 34 | 4 | 0.0072 | 0.2310 | 0.0209 | 0.6800 | 0.0018 | 0.0033 |
| 23 35 | 7 | 0.0706 | 0.0429 | 0.0696 | 0.0521 | 0.0331 | 0.1301 |
| 24 36 | 8 | 0.0595 | 0.0461 | 0.1116 | 0.0689 | 0.0493 | 0.0605 |
| 25 37 | 4 | 0.0306 | 0.1092 | 0.1657 | 0.4841 | 0.0063 | 0.0108 |
| 26 38 | 9 | 0.0092 | 0.1328 | 0.0249 | 0.1896 | 0.0046 | 0.0076 |
| 27 39 | 9 | 0.0289 | 0.0780 | 0.1058 | 0.1747 | 0.0174 | 0.0269 |
| 28 40 | 2 | 0.2202 | 0.2299 | 0.1833 | 0.2181 | 0.0105 | 0.0213 |
| 29 41 | 3 | 0.0473 | 0.0214 | 0.8138 | 0.0503 | 0.0034 | 0.0071 |
| 30 42 | 4 | 0.1305 | 0.2151 | 0.2281 | 0.3093 | 0.0071 | 0.0149 |
| 31 43 | 5 | 0.0058 | 0.0097 | 0.0085 | 0.0104 | 0.8739 | 0.0454 |
| 32 46 | 2 | 0.0134 | 0.6871 | 0.0254 | 0.1326 | 0.0059 | 0.0093 |
| 33 47 | 1 | 0.8441 | 0.0158 | 0.0794 | 0.0225 | 0.0024 | 0.0046 |
| 34 49 | 3 | 0.0427 | 0.0452 | 0.6588 | 0.1419 | 0.0052 | 0.0099 |
| 35 52 | 4 | 0.0169 | 0.1066 | 0.0709 | 0.5006 | 0.0051 | 0.0089 |

**Membership Matrix Section**

| Row | Cluster | Prob in 1 | Prob in 2 | Prob in 3 | Prob in 4 | Prob in 5 | Prob in 6 |
|---|---|---|---|---|---|---|---|
| 36 54 | 2 | 0.0082 | 0.8471 | 0.0146 | 0.0766 | 0.0027 | 0.0046 |
| 37 55 | 2 | 0.0161 | 0.5189 | 0.0365 | 0.3628 | 0.0031 | 0.0064 |
| 38 56 | 1 | 0.7296 | 0.0327 | 0.0842 | 0.0399 | 0.0084 | 0.0158 |
| 39 58 | 2 | 0.0068 | 0.8600 | 0.0125 | 0.0717 | 0.0023 | 0.0039 |
| 40 60 | 9 | 0.0059 | 0.0433 | 0.0158 | 0.0626 | 0.0041 | 0.0058 |
| 41 61 | 8 | 0.0919 | 0.0487 | 0.0969 | 0.0614 | 0.0386 | 0.0433 |
| 42 63 | 8 | 0.0654 | 0.0544 | 0.0968 | 0.0713 | 0.0744 | 0.0628 |
| 43 64 | 6 | 0.0024 | 0.0034 | 0.0035 | 0.0040 | 0.0087 | 0.8962 |
| 44 65 | 9 | 0.0199 | 0.0713 | 0.0738 | 0.1755 | 0.0113 | 0.0196 |
| 45 67 | 7 | 0.0124 | 0.0122 | 0.0151 | 0.0144 | 0.0105 | 0.0866 |
| 46 68 | 3 | 0.0398 | 0.0169 | 0.8663 | 0.0413 | 0.0018 | 0.0036 |
| 47 71 | 7 | 0.0196 | 0.0168 | 0.0270 | 0.0219 | 0.0233 | 0.1435 |
| 48 72 | 1 | 0.7759 | 0.0245 | 0.0763 | 0.0313 | 0.0062 | 0.0116 |
| 49 73 | 2 | 0.0077 | 0.8612 | 0.0136 | 0.0779 | 0.0021 | 0.0038 |
| 50 74 | 5 | 0.0656 | 0.1047 | 0.0790 | 0.0980 | 0.2410 | 0.1222 |
| 51 75 | 4 | 0.0401 | 0.1032 | 0.2710 | 0.4434 | 0.0055 | 0.0098 |
| 52 77 | 5 | 0.0387 | 0.0427 | 0.0569 | 0.0527 | 0.3313 | 0.1767 |
| 53 80 | 9 | 0.0453 | 0.0856 | 0.2546 | 0.2383 | 0.0144 | 0.0246 |
| 54 82 | 6 | 0.0100 | 0.0185 | 0.0146 | 0.0196 | 0.0444 | 0.7417 |
| 55 83 | 4 | 0.0088 | 0.1667 | 0.0278 | 0.6436 | 0.0028 | 0.0051 |
| 56 84 | 9 | 0.0346 | 0.0906 | 0.0757 | 0.1191 | 0.0803 | 0.0707 |
| 57 85 | 6 | 0.0103 | 0.0121 | 0.0149 | 0.0148 | 0.0330 | 0.5194 |
| 58 86 | 9 | 0.0112 | 0.0653 | 0.0271 | 0.0835 | 0.0128 | 0.0207 |
| 59 87 | 1 | 0.8305 | 0.0248 | 0.0654 | 0.0308 | 0.0035 | 0.0070 |
| 60 89 | 5 | 0.0202 | 0.0418 | 0.0290 | 0.0409 | 0.6028 | 0.1171 |
| 61 90 | 6 | 0.0060 | 0.0084 | 0.0086 | 0.0098 | 0.0121 | 0.5648 |
| 62 91 | 8 | 0.0278 | 0.0096 | 0.0386 | 0.0144 | 0.0044 | 0.0065 |
| 63 92 | 5 | 0.0577 | 0.0569 | 0.0762 | 0.0676 | 0.2634 | 0.1295 |
| 64 93 | 1 | 0.8024 | 0.0256 | 0.0908 | 0.0348 | 0.0032 | 0.0065 |
| 65 95 | 2 | 0.0168 | 0.6760 | 0.0327 | 0.2180 | 0.0029 | 0.0055 |
| 66 97 | 9 | 0.0152 | 0.0819 | 0.0371 | 0.1082 | 0.0178 | 0.0321 |
| 67 98 | 2 | 0.0084 | 0.6685 | 0.0191 | 0.2026 | 0.0029 | 0.0052 |
| 68 99 | 3 | 0.0949 | 0.0479 | 0.6786 | 0.1099 | 0.0037 | 0.0071 |
| 69 101 | 7 | 0.0257 | 0.0254 | 0.0355 | 0.0315 | 0.0750 | 0.3041 |
| 70 102 | 5 | 0.0238 | 0.0514 | 0.0344 | 0.0498 | 0.4734 | 0.1805 |
| 71 103 | 4 | 0.0077 | 0.1009 | 0.0273 | 0.7746 | 0.0020 | 0.0040 |
| 72 104 | 7 | 0.0121 | 0.0181 | 0.0168 | 0.0201 | 0.0204 | 0.4285 |
| 73 105 | 5 | 0.0095 | 0.0155 | 0.0135 | 0.0164 | 0.8372 | 0.0433 |
| 74 107 | 3 | 0.1359 | 0.0488 | 0.6314 | 0.1052 | 0.0045 | 0.0102 |
| 75 110 | 6 | 0.0125 | 0.0161 | 0.0198 | 0.0202 | 0.0467 | 0.5850 |
| 76 113 | 4 | 0.0319 | 0.1352 | 0.1360 | 0.6162 | 0.0036 | 0.0077 |
| 77 114 | 2 | 0.0307 | 0.4853 | 0.0494 | 0.1630 | 0.0190 | 0.0275 |
| 78 115 | 3 | 0.1198 | 0.0373 | 0.6810 | 0.0799 | 0.0047 | 0.0108 |
| 79 117 | 4 | 0.0737 | 0.1186 | 0.3525 | 0.3590 | 0.0050 | 0.0107 |

**Membership Matrix Section**

| Row | Cluster | Prob in 1 | Prob in 2 | Prob in 3 | Prob in 4 | Prob in 5 | Prob in 6 |
|---|---|---|---|---|---|---|---|
| 80 118 | 6 | 0.0045 | 0.0074 | 0.0068 | 0.0083 | 0.0277 | 0.8619 |
| 81 120 | 5 | 0.0143 | 0.0211 | 0.0215 | 0.0242 | 0.6082 | 0.1740 |
| 82 121 | 6 | 0.0065 | 0.0082 | 0.0095 | 0.0099 | 0.0195 | 0.6336 |
| 83 122 | 7 | 0.0086 | 0.0092 | 0.0110 | 0.0109 | 0.0084 | 0.0860 |
| 84 124 | 9 | 0.0568 | 0.2009 | 0.0797 | 0.1458 | 0.0998 | 0.0844 |
| 85 125 | 7 | 0.0154 | 0.0140 | 0.0185 | 0.0168 | 0.0116 | 0.0845 |
| 86 126 | 2 | 0.0059 | 0.8611 | 0.0114 | 0.0740 | 0.0021 | 0.0036 |
| 87 127 | 6 | 0.0181 | 0.0371 | 0.0264 | 0.0377 | 0.0901 | 0.5796 |
| 88 128 | 5 | 0.0153 | 0.0207 | 0.0211 | 0.0229 | 0.7535 | 0.0647 |
| 89 129 | 9 | 0.0295 | 0.2568 | 0.0536 | 0.1581 | 0.0287 | 0.0340 |
| 90 130 | 8 | 0.0348 | 0.0140 | 0.0413 | 0.0197 | 0.0088 | 0.0118 |
| 91 131 | 7 | 0.0595 | 0.0430 | 0.0807 | 0.0571 | 0.0715 | 0.1765 |
| 92 132 | 4 | 0.2096 | 0.2049 | 0.2110 | 0.2390 | 0.0091 | 0.0189 |
| 93 133 | 6 | 0.0036 | 0.0055 | 0.0052 | 0.0062 | 0.0124 | 0.8617 |
| 94 134 | 8 | 0.0778 | 0.0721 | 0.1005 | 0.0855 | 0.1379 | 0.0909 |
| 95 135 | 4 | 0.0073 | 0.0794 | 0.0273 | 0.8429 | 0.0014 | 0.0028 |
| 96 136 | 7 | 0.0241 | 0.0208 | 0.0296 | 0.0253 | 0.0373 | 0.1849 |
| 97 138 | 7 | 0.0109 | 0.0105 | 0.0157 | 0.0136 | 0.0116 | 0.1087 |
| 98 139 | 2 | 0.0772 | 0.3877 | 0.1132 | 0.3041 | 0.0075 | 0.0154 |
| 99 140 | 4 | 0.0067 | 0.1648 | 0.0203 | 0.7523 | 0.0016 | 0.0029 |
| 100 141 | 8 | 0.0701 | 0.0198 | 0.0979 | 0.0307 | 0.0074 | 0.0113 |
| 101 142 | 8 | 0.0588 | 0.0430 | 0.0879 | 0.0581 | 0.0564 | 0.0560 |
| 102 143 | 1 | 0.5489 | 0.0345 | 0.1677 | 0.0493 | 0.0093 | 0.0164 |
| 103 144 | 5 | 0.0363 | 0.0689 | 0.0487 | 0.0651 | 0.4564 | 0.1135 |
| 104 146 | 8 | 0.0519 | 0.0261 | 0.1174 | 0.0431 | 0.0129 | 0.0196 |
| 105 147 | 4 | 0.0159 | 0.2752 | 0.0432 | 0.5241 | 0.0048 | 0.0106 |
| 106 148 | 6 | 0.0028 | 0.0040 | 0.0041 | 0.0047 | 0.0121 | 0.8914 |
| 107 149 | 4 | 0.0081 | 0.3455 | 0.0218 | 0.5632 | 0.0020 | 0.0038 |
| 108 150 | 2 | 0.0224 | 0.7231 | 0.0346 | 0.1455 | 0.0047 | 0.0087 |
| 109 151 | 2 | 0.0214 | 0.4771 | 0.0470 | 0.3868 | 0.0034 | 0.0069 |
| 110 152 | 7 | 0.0072 | 0.0090 | 0.0098 | 0.0105 | 0.0095 | 0.1632 |
| 111 153 | 7 | 0.0058 | 0.0072 | 0.0080 | 0.0084 | 0.0098 | 0.2452 |
| 112 154 | 6 | 0.0105 | 0.0142 | 0.0155 | 0.0166 | 0.0703 | 0.6640 |
| 113 155 | 7 | 0.0108 | 0.0095 | 0.0142 | 0.0120 | 0.0111 | 0.0849 |
| 114 156 | 5 | 0.0194 | 0.0400 | 0.0294 | 0.0409 | 0.4210 | 0.2682 |
| 115 158 | 3 | 0.1455 | 0.0238 | 0.6951 | 0.0456 | 0.0042 | 0.0081 |
| 116 159 | 6 | 0.0071 | 0.0125 | 0.0103 | 0.0134 | 0.0287 | 0.8002 |
| 117 161 | 8 | 0.2066 | 0.0427 | 0.1316 | 0.0570 | 0.0199 | 0.0312 |
| 118 163 | 9 | 0.0111 | 0.0475 | 0.0308 | 0.0758 | 0.0098 | 0.0133 |
| 119 164 | 3 | 0.0724 | 0.0758 | 0.5455 | 0.2222 | 0.0043 | 0.0084 |
| 120 165 | 5 | 0.0125 | 0.0167 | 0.0176 | 0.0188 | 0.7738 | 0.0689 |
| 121 168 | 9 | 0.0112 | 0.0807 | 0.0268 | 0.0886 | 0.0090 | 0.0115 |
| 122 171 | 9 | 0.0111 | 0.1819 | 0.0265 | 0.1580 | 0.0069 | 0.0112 |
| 123 172 | 3 | 0.0530 | 0.0458 | 0.6212 | 0.1217 | 0.0079 | 0.0160 |

**Membership Matrix Section**

| Row | Cluster | Prob in 7 | Prob in 8 | Prob in 9 |
|---|---|---|---|---|
| 1 1 | 3 | 0.0121 | 0.0461 | 0.0255 |
| 2 2 | 3 | 0.0084 | 0.0324 | 0.0223 |
| 3 3 | 9 | 0.0060 | 0.0044 | 0.8426 |
| 4 4 | 4 | 0.0120 | 0.0105 | 0.0520 |
| 5 6 | 6 | 0.3546 | 0.0047 | 0.0104 |
| 6 7 | 3 | 0.0129 | 0.0270 | 0.0212 |
| 7 10 | 3 | 0.0222 | 0.0225 | 0.0508 |
| 8 11 | 8 | 0.0127 | 0.7951 | 0.0171 |
| 9 12 | 4 | 0.0030 | 0.0028 | 0.0316 |
| 10 13 | 1 | 0.0059 | 0.0098 | 0.0070 |
| 11 14 | 3 | 0.0172 | 0.0584 | 0.0248 |
| 12 15 | 3 | 0.0206 | 0.0317 | 0.1576 |
| 13 19 | 6 | 0.0767 | 0.0048 | 0.0141 |
| 14 20 | 9 | 0.0095 | 0.0109 | 0.3731 |
| 15 21 | 7 | 0.6656 | 0.0079 | 0.0167 |
| 16 22 | 9 | 0.0080 | 0.0087 | 0.5980 |
| 17 26 | 6 | 0.2658 | 0.0046 | 0.0101 |
| 18 27 | 8 | 0.1080 | 0.1517 | 0.1041 |
| 19 29 | 3 | 0.0289 | 0.1686 | 0.0755 |
| 20 31 | 6 | 0.1959 | 0.0040 | 0.0095 |
| 21 32 | 6 | 0.0920 | 0.0068 | 0.0171 |
| 22 34 | 4 | 0.0035 | 0.0031 | 0.0492 |
| 23 35 | 7 | 0.5123 | 0.0469 | 0.0425 |
| 24 36 | 8 | 0.0709 | 0.4525 | 0.0806 |
| 25 37 | 4 | 0.0118 | 0.0186 | 0.1629 |
| 26 38 | 9 | 0.0071 | 0.0059 | 0.6183 |
| 27 39 | 9 | 0.0259 | 0.0354 | 0.5069 |
| 28 40 | 2 | 0.0274 | 0.0261 | 0.0632 |
| 29 41 | 3 | 0.0098 | 0.0241 | 0.0228 |
| 30 42 | 4 | 0.0191 | 0.0190 | 0.0570 |
| 31 43 | 5 | 0.0231 | 0.0075 | 0.0157 |
| 32 46 | 2 | 0.0088 | 0.0067 | 0.1109 |
| 33 47 | 1 | 0.0065 | 0.0147 | 0.0101 |
| 34 49 | 3 | 0.0122 | 0.0264 | 0.0578 |
| 35 52 | 4 | 0.0092 | 0.0108 | 0.2711 |
| 36 54 | 2 | 0.0046 | 0.0035 | 0.0381 |
| 37 55 | 2 | 0.0071 | 0.0052 | 0.0440 |
| 38 56 | 1 | 0.0235 | 0.0428 | 0.0231 |
| 39 58 | 2 | 0.0039 | 0.0029 | 0.0360 |
| 40 60 | 9 | 0.0051 | 0.0049 | 0.8524 |
| 41 61 | 8 | 0.0520 | 0.5087 | 0.0586 |
| 42 63 | 8 | 0.0669 | 0.4222 | 0.0859 |
| 43 64 | 6 | 0.0744 | 0.0023 | 0.0049 |
| 44 65 | 9 | 0.0187 | 0.0192 | 0.5908 |

**Membership Matrix Section**

| Row | Cluster | Prob in 7 | Prob in 8 | Prob in 9 |
|---|---|---|---|---|
| 45 67 | 7 | 0.8278 | 0.0083 | 0.0128 |
| 46 68 | 3 | 0.0048 | 0.0113 | 0.0141 |
| 47 71 | 7 | 0.7044 | 0.0216 | 0.0219 |
| 48 72 | 1 | 0.0171 | 0.0391 | 0.0180 |
| 49 73 | 2 | 0.0039 | 0.0029 | 0.0270 |
| 50 74 | 5 | 0.0994 | 0.0674 | 0.1226 |
| 51 75 | 4 | 0.0113 | 0.0188 | 0.0969 |
| 52 77 | 5 | 0.1485 | 0.0821 | 0.0703 |
| 53 80 | 9 | 0.0268 | 0.0507 | 0.2597 |
| 54 82 | 6 | 0.1173 | 0.0086 | 0.0253 |
| 55 83 | 4 | 0.0052 | 0.0045 | 0.1354 |
| 56 84 | 9 | 0.0532 | 0.0504 | 0.4256 |
| 57 85 | 6 | 0.3665 | 0.0116 | 0.0174 |
| 58 86 | 9 | 0.0161 | 0.0096 | 0.7538 |
| 59 87 | 1 | 0.0101 | 0.0141 | 0.0137 |
| 60 89 | 5 | 0.0621 | 0.0214 | 0.0648 |
| 61 90 | 6 | 0.3748 | 0.0049 | 0.0107 |
| 62 91 | 8 | 0.0085 | 0.8783 | 0.0119 |
| 63 92 | 5 | 0.1236 | 0.1409 | 0.0842 |
| 64 93 | 1 | 0.0094 | 0.0134 | 0.0139 |
| 65 95 | 2 | 0.0061 | 0.0051 | 0.0369 |
| 66 97 | 9 | 0.0247 | 0.0129 | 0.6700 |
| 67 98 | 2 | 0.0051 | 0.0039 | 0.0841 |
| 68 99 | 3 | 0.0091 | 0.0184 | 0.0304 |
| 69 101 | 7 | 0.4318 | 0.0351 | 0.0359 |
| 70 102 | 5 | 0.0854 | 0.0236 | 0.0778 |
| 71 103 | 4 | 0.0042 | 0.0037 | 0.0754 |
| 72 104 | 7 | 0.4541 | 0.0089 | 0.0210 |
| 73 105 | 5 | 0.0270 | 0.0129 | 0.0247 |
| 74 107 | 3 | 0.0146 | 0.0190 | 0.0303 |
| 75 110 | 6 | 0.2585 | 0.0153 | 0.0258 |
| 76 113 | 4 | 0.0094 | 0.0092 | 0.0508 |
| 77 114 | 2 | 0.0247 | 0.0166 | 0.1837 |
| 78 115 | 3 | 0.0160 | 0.0222 | 0.0283 |
| 79 117 | 4 | 0.0137 | 0.0155 | 0.0514 |
| 80 118 | 6 | 0.0676 | 0.0045 | 0.0112 |
| 81 120 | 5 | 0.0806 | 0.0202 | 0.0358 |
| 82 121 | 6 | 0.2944 | 0.0068 | 0.0116 |
| 83 122 | 7 | 0.8499 | 0.0060 | 0.0100 |
| 84 124 | 9 | 0.0669 | 0.0444 | 0.2212 |
| 85 125 | 7 | 0.8143 | 0.0103 | 0.0146 |
| 86 126 | 2 | 0.0036 | 0.0026 | 0.0356 |
| 87 127 | 6 | 0.1450 | 0.0152 | 0.0507 |
| 88 128 | 5 | 0.0454 | 0.0242 | 0.0321 |

**Membership Matrix Section**

| Row | Cluster | Prob in 7 | Prob in 8 | Prob in 9 |
|---|---|---|---|---|
| 89 129 | 9 | 0.0283 | 0.0214 | 0.3897 |
| 90 130 | 8 | 0.0153 | 0.8368 | 0.0176 |
| 91 131 | 7 | 0.3435 | 0.1089 | 0.0593 |
| 92 132 | 4 | 0.0246 | 0.0239 | 0.0591 |
| 93 133 | 6 | 0.0948 | 0.0032 | 0.0074 |
| 94 134 | 8 | 0.0909 | 0.2413 | 0.1032 |
| 95 135 | 4 | 0.0031 | 0.0029 | 0.0330 |
| 96 136 | 7 | 0.6268 | 0.0258 | 0.0256 |
| 97 138 | 7 | 0.8056 | 0.0100 | 0.0134 |
| 98 139 | 2 | 0.0187 | 0.0152 | 0.0610 |
| 99 140 | 4 | 0.0031 | 0.0028 | 0.0455 |
| 100 141 | 8 | 0.0149 | 0.7247 | 0.0232 |
| 101 142 | 8 | 0.0640 | 0.5087 | 0.0672 |
| 102 143 | 1 | 0.0234 | 0.1210 | 0.0296 |
| 103 144 | 5 | 0.0771 | 0.0393 | 0.0949 |
| 104 146 | 8 | 0.0253 | 0.6641 | 0.0396 |
| 105 147 | 4 | 0.0112 | 0.0069 | 0.1082 |
| 106 148 | 6 | 0.0722 | 0.0028 | 0.0058 |
| 107 149 | 4 | 0.0040 | 0.0033 | 0.0483 |
| 108 150 | 2 | 0.0094 | 0.0070 | 0.0447 |
| 109 151 | 2 | 0.0079 | 0.0062 | 0.0434 |
| 110 152 | 7 | 0.7751 | 0.0053 | 0.0104 |
| 111 153 | 7 | 0.7021 | 0.0047 | 0.0088 |
| 112 154 | 6 | 0.1747 | 0.0125 | 0.0216 |
| 113 155 | 7 | 0.8363 | 0.0097 | 0.0115 |
| 114 156 | 5 | 0.0954 | 0.0203 | 0.0654 |
| 115 158 | 3 | 0.0114 | 0.0442 | 0.0220 |
| 116 159 | 6 | 0.1047 | 0.0061 | 0.0170 |
| 117 161 | 8 | 0.0442 | 0.4237 | 0.0431 |
| 118 163 | 9 | 0.0115 | 0.0116 | 0.7887 |
| 119 164 | 3 | 0.0105 | 0.0170 | 0.0440 |
| 120 165 | 5 | 0.0454 | 0.0198 | 0.0266 |
| 121 168 | 9 | 0.0099 | 0.0095 | 0.7527 |
| 122 171 | 9 | 0.0100 | 0.0071 | 0.5874 |
| 123 172 | 3 | 0.0205 | 0.0440 | 0.0699 |

**Cluster Medoids Section**

| Variable | Cluster1 | Cluster2 | Cluster3 | Cluster4 | Cluster5 | Cluster6 |
|---|---|---|---|---|---|---|
| Factor1 | -0.8839 | -0.2941 | -0.3915 | 0.4986 | 1.0082 | 2.2997 |
| Factor2 | -1.3572 | 0.8048 | -0.5192 | -0.8558 | 2.2898 | -1.0495 |
| Factor3 | -1.0036 | -1.573 | 1.2344 | -0.3941 | 0.3485 | -1.6501 |
| Row | 10 13 | 47 71 | 39 58 | 46 68 | 31 43 | 62 91 |

**Cluster Medoids Section**

| Variable | Cluster7 | Cluster8 | Cluster9 | Cluster10 |
|---|---|---|---|---|
| Factor1 | -0.3836 | -1.217 | 0.0488 | 1.0327 |
| Factor2 | 1.3901 | 0.8435 | -0.533 | -0.14 |
| Factor3 | -0.3014 | -0.797 | 0.4977 | 1.0032 |
| Row | 80 118 | 110 152 | 9 12 | 40 60 |

**Membership Summary Section for Clusters = 10**

<table>
<tr><th>Row</th><th>Cluster</th><th>Cluster Membership</th><th>Sum of Squared Memberships</th><th>Bar of Squared Memberships</th><th>Silhouette Amount</th><th>Silhouette Bar</th></tr>
<tr><td>10 13</td><td>1</td><td>0.9087</td><td>0.8275</td><td>|IIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.5452</td><td>|IIIIIIIIIIIIIIII</td></tr>
<tr><td>33 47</td><td>1</td><td>0.8493</td><td>0.7277</td><td>|IIIIIIIIIIIIIIIIIIIIII</td><td>0.3893</td><td>|IIIIIIIIIIII</td></tr>
<tr><td>59 87</td><td>1</td><td>0.8347</td><td>0.7023</td><td>|IIIIIIIIIIIIIIIIIIIII</td><td>0.4495</td><td>|IIIIIIIIIIIII</td></tr>
<tr><td>64 93</td><td>1</td><td>0.8100</td><td>0.6652</td><td>|IIIIIIIIIIIIIIIIIIII</td><td>0.3180</td><td>|IIIIIIIIII</td></tr>
<tr><td>48 72</td><td>1</td><td>0.7637</td><td>0.5929</td><td>|IIIIIIIIIIIIIIIIII</td><td>0.5525</td><td>|IIIIIIIIIIIIIIIII</td></tr>
<tr><td>38 56</td><td>1</td><td>0.7159</td><td>0.5254</td><td>|IIIIIIIIIIIIIIII</td><td>0.5355</td><td>|IIIIIIIIIIIIIIII</td></tr>
<tr><td>102 143</td><td>1</td><td>0.5277</td><td>0.3280</td><td>|IIIIIIIIII</td><td>0.3205</td><td>|IIIIIIIIII</td></tr>
<tr><td>11 14</td><td>1</td><td>0.3933</td><td>0.3164</td><td>|IIIIIIIII</td><td>-0.1549</td><td>|</td></tr>
<tr><td>47 71</td><td>2</td><td>0.7255</td><td>0.5497</td><td>|IIIIIIIIIIIIIIII</td><td>0.3411</td><td>|IIIIIIIIII</td></tr>
<tr><td>69 101</td><td>2</td><td>0.7245</td><td>0.5427</td><td>|IIIIIIIIIIIIIIII</td><td>0.4209</td><td>|IIIIIIIIIIIII</td></tr>
<tr><td>96 136</td><td>2</td><td>0.6415</td><td>0.4487</td><td>|IIIIIIIIIIIII</td><td>0.2796</td><td>|IIIIIIII</td></tr>
<tr><td>57 85</td><td>2</td><td>0.6214</td><td>0.4380</td><td>|IIIIIIIIIIIII</td><td>0.2255</td><td>|IIIIIII</td></tr>
<tr><td>113 155</td><td>2</td><td>0.5392</td><td>0.3880</td><td>|IIIIIIIIIIII</td><td>0.0424</td><td>|I</td></tr>
<tr><td>91 131</td><td>2</td><td>0.5098</td><td>0.2948</td><td>|IIIIIIIII</td><td>0.3474</td><td>|IIIIIIIIII</td></tr>
<tr><td>97 138</td><td>2</td><td>0.4911</td><td>0.3625</td><td>|IIIIIIIIIII</td><td>-0.0022</td><td>|</td></tr>
<tr><td>75 110</td><td>2</td><td>0.4868</td><td>0.3333</td><td>|IIIIIIIIII</td><td>0.0315</td><td>|I</td></tr>
<tr><td>82 121</td><td>2</td><td>0.4171</td><td>0.3137</td><td>|IIIIIIIII</td><td>0.0152</td><td>|</td></tr>
<tr><td>39 58</td><td>3</td><td>0.9203</td><td>0.8492</td><td>|IIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.3962</td><td>|IIIIIIIIIIII</td></tr>
<tr><td>86 126</td><td>3</td><td>0.9138</td><td>0.8377</td><td>|IIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.3517</td><td>|IIIIIIIIIII</td></tr>
<tr><td>36 54</td><td>3</td><td>0.9053</td><td>0.8225</td><td>|IIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.4005</td><td>|IIIIIIIIIIII</td></tr>
<tr><td>49 73</td><td>3</td><td>0.8565</td><td>0.7417</td><td>|IIIIIIIIIIIIIIIIIIIIII</td><td>0.2526</td><td>|IIIIIIII</td></tr>
<tr><td>32 46</td><td>3</td><td>0.7951</td><td>0.6447</td><td>|IIIIIIIIIIIIIIIIIII</td><td>0.3889</td><td>|IIIIIIIIIIII</td></tr>
<tr><td>67 98</td><td>3</td><td>0.6948</td><td>0.5234</td><td>|IIIIIIIIIIIIIIII</td><td>0.0491</td><td>|I</td></tr>
<tr><td>108 150</td><td>3</td><td>0.6496</td><td>0.4655</td><td>|IIIIIIIIIIIIII</td><td>0.0718</td><td>|II</td></tr>
<tr><td>77 114</td><td>3</td><td>0.5534</td><td>0.3511</td><td>|IIIIIIIIIII</td><td>0.3914</td><td>|IIIIIIIIIIII</td></tr>
<tr><td>65 95</td><td>3</td><td>0.4870</td><td>0.3839</td><td>|IIIIIIIIIIII</td><td>-0.2609</td><td>|</td></tr>
<tr><td>84 124</td><td>3</td><td>0.2046</td><td>0.1306</td><td>|IIII</td><td>0.0666</td><td>|II</td></tr>
<tr><td>46 68</td><td>4</td><td>0.8716</td><td>0.7630</td><td>|IIIIIIIIIIIIIIIIIIIIIII</td><td>0.5137</td><td>|IIIIIIIIIIIIIII</td></tr>
<tr><td>29 41</td><td>4</td><td>0.8155</td><td>0.6709</td><td>|IIIIIIIIIIIIIIIIIIII</td><td>0.5327</td><td>|IIIIIIIIIIIIIIII</td></tr>
<tr><td>2 2</td><td>4</td><td>0.7948</td><td>0.6394</td><td>|IIIIIIIIIIIIIIIIIII</td><td>0.5451</td><td>|IIIIIIIIIIIIIIII</td></tr>
<tr><td>34 49</td><td>4</td><td>0.6922</td><td>0.4988</td><td>|IIIIIIIIIIIIIII</td><td>0.3597</td><td>|IIIIIIIIIII</td></tr>
<tr><td>68 99</td><td>4</td><td>0.6864</td><td>0.4940</td><td>|IIIIIIIIIIIIIII</td><td>0.3276</td><td>|IIIIIIIIII</td></tr>
<tr><td>115 158</td><td>4</td><td>0.6790</td><td>0.4887</td><td>|IIIIIIIIIIIIIII</td><td>0.3890</td><td>|IIIIIIIIIIII</td></tr>
<tr><td>78 115</td><td>4</td><td>0.6720</td><td>0.4754</td><td>|IIIIIIIIIIIIII</td><td>0.4212</td><td>|IIIIIIIIIIIII</td></tr>
<tr><td>123 172</td><td>4</td><td>0.6335</td><td>0.4237</td><td>|IIIIIIIIIIIII</td><td>0.4017</td><td>|IIIIIIIIIIII</td></tr>
</table>

**Membership Summary Section for Clusters = 10**

<table>
<tr><th>Row</th><th>Cluster</th><th>Cluster Membership</th><th>Sum of Squared Memberships</th><th>Bar of Squared Memberships</th><th>Silhouette Amount</th><th>Silhouette Bar</th></tr>
<tr><td>74 107</td><td>4</td><td>0.6246</td><td>0.4238</td><td>|IIIIIIIIIIIII</td><td>0.3280</td><td>|IIIIIIIIII</td></tr>
<tr><td>1 1</td><td>4</td><td>0.5778</td><td>0.3916</td><td>|IIIIIIIIIIII</td><td>0.2850</td><td>|IIIIIIIII</td></tr>
<tr><td>119 164</td><td>4</td><td>0.5603</td><td>0.3721</td><td>|IIIIIIIIIII</td><td>0.0937</td><td>|III</td></tr>
<tr><td>6 7</td><td>4</td><td>0.4809</td><td>0.3599</td><td>|IIIIIIIIIII</td><td>0.1765</td><td>|IIIII</td></tr>
<tr><td>19 29</td><td>4</td><td>0.4537</td><td>0.2585</td><td>|IIIIIIII</td><td>0.4173</td><td>|IIIIIIIIIIIII</td></tr>
<tr><td>12 15</td><td>4</td><td>0.3733</td><td>0.2345</td><td>|IIIIIII</td><td>0.0918</td><td>|III</td></tr>
<tr><td>7 10</td><td>4</td><td>0.3034</td><td>0.2132</td><td>|IIIIII</td><td>-0.1418</td><td>|</td></tr>
<tr><td>31 43</td><td>5</td><td>0.8462</td><td>0.7205</td><td>|IIIIIIIIIIIIIIIIIIIIII</td><td>-0.1006</td><td>|</td></tr>
<tr><td>73 105</td><td>5</td><td>0.8344</td><td>0.7001</td><td>|IIIIIIIIIIIIIIIIIIIII</td><td>0.1970</td><td>|IIIIII</td></tr>
<tr><td>120 165</td><td>5</td><td>0.7401</td><td>0.5589</td><td>|IIIIIIIIIIIIIIIII</td><td>0.0617</td><td>|II</td></tr>
<tr><td>88 128</td><td>5</td><td>0.7368</td><td>0.5530</td><td>|IIIIIIIIIIIIIIIII</td><td>0.1931</td><td>|IIIIII</td></tr>
<tr><td>60 89</td><td>5</td><td>0.5310</td><td>0.3168</td><td>|IIIIIIIIII</td><td>-0.1505</td><td>|</td></tr>
<tr><td>81 120</td><td>5</td><td>0.4980</td><td>0.3045</td><td>|IIIIIIIII</td><td>-0.3731</td><td>|</td></tr>
<tr><td>103 144</td><td>5</td><td>0.4174</td><td>0.2176</td><td>|IIIIIII</td><td>0.1368</td><td>|IIII</td></tr>
<tr><td>70 102</td><td>5</td><td>0.3843</td><td>0.2173</td><td>|IIIIIII</td><td>-0.3572</td><td>|</td></tr>
<tr><td>52 77</td><td>5</td><td>0.2525</td><td>0.1658</td><td>|IIIII</td><td>-0.2983</td><td>|</td></tr>
<tr><td>63 92</td><td>5</td><td>0.2269</td><td>0.1305</td><td>|IIII</td><td>-0.0990</td><td>|</td></tr>
<tr><td>50 74</td><td>5</td><td>0.2179</td><td>0.1188</td><td>|IIII</td><td>0.1283</td><td>|IIII</td></tr>
<tr><td>62 91</td><td>6</td><td>0.9133</td><td>0.8353</td><td>|IIIIIIIIIIIIIIIIIIIIIIIII</td><td>-0.3640</td><td>|</td></tr>
<tr><td>8 11</td><td>6</td><td>0.8550</td><td>0.7351</td><td>|IIIIIIIIIIIIIIIIIIIIII</td><td>-0.4456</td><td>|</td></tr>
<tr><td>90 130</td><td>6</td><td>0.8336</td><td>0.6988</td><td>|IIIIIIIIIIIIIIIIIIIII</td><td>-0.1306</td><td>|</td></tr>
<tr><td>100 141</td><td>6</td><td>0.7920</td><td>0.6361</td><td>|IIIIIIIIIIIIIIIIIII</td><td>-0.4930</td><td>|</td></tr>
<tr><td>104 146</td><td>6</td><td>0.6513</td><td>0.4452</td><td>|IIIIIIIIIIIII</td><td>-0.4840</td><td>|</td></tr>
<tr><td>41 61</td><td>6</td><td>0.4693</td><td>0.2549</td><td>|IIIIIIII</td><td>0.1160</td><td>|III</td></tr>
<tr><td>117 161</td><td>6</td><td>0.4434</td><td>0.2549</td><td>|IIIIIIII</td><td>-0.4673</td><td>|</td></tr>
<tr><td>101 142</td><td>6</td><td>0.4141</td><td>0.2122</td><td>|IIIIII</td><td>0.0211</td><td>|I</td></tr>
<tr><td>24 36</td><td>6</td><td>0.3687</td><td>0.1852</td><td>|IIIIII</td><td>-0.2628</td><td>|</td></tr>
<tr><td>42 63</td><td>6</td><td>0.3451</td><td>0.1688</td><td>|IIIII</td><td>0.0730</td><td>|II</td></tr>
<tr><td>94 134</td><td>6</td><td>0.1985</td><td>0.1141</td><td>|III</td><td>0.1231</td><td>|IIII</td></tr>
<tr><td>18 27</td><td>6</td><td>0.1334</td><td>0.1017</td><td>|III</td><td>0.1225</td><td>|IIII</td></tr>
<tr><td>80 118</td><td>7</td><td>0.8718</td><td>0.7646</td><td>|IIIIIIIIIIIIIIIIIIIIIII</td><td>0.5479</td><td>|IIIIIIIIIIIIIIII</td></tr>
<tr><td>13 19</td><td>7</td><td>0.8493</td><td>0.7279</td><td>|IIIIIIIIIIIIIIIIIIIIII</td><td>0.4611</td><td>|IIIIIIIIIIIIII</td></tr>
<tr><td>116 159</td><td>7</td><td>0.7989</td><td>0.6514</td><td>|IIIIIIIIIIIIIIIIIIII</td><td>0.4335</td><td>|IIIIIIIIIIIII</td></tr>
<tr><td>106 148</td><td>7</td><td>0.7722</td><td>0.6147</td><td>|IIIIIIIIIIIIIIIIII</td><td>0.3703</td><td>|IIIIIIIIIII</td></tr>
<tr><td>54 82</td><td>7</td><td>0.7675</td><td>0.6036</td><td>|IIIIIIIIIIIIIIIIII</td><td>0.4640</td><td>|IIIIIIIIIIIIII</td></tr>
<tr><td>21 32</td><td>7</td><td>0.7520</td><td>0.5824</td><td>|IIIIIIIIIIIIIIIII</td><td>0.4598</td><td>|IIIIIIIIIIIIII</td></tr>
<tr><td>93 133</td><td>7</td><td>0.7465</td><td>0.5862</td><td>|IIIIIIIIIIIIIIIIII</td><td>0.2537</td><td>|IIIIIIII</td></tr>
<tr><td>43 64</td><td>7</td><td>0.7324</td><td>0.5641</td><td>|IIIIIIIIIIIIIIIII</td><td>0.2682</td><td>|IIIIIIII</td></tr>
<tr><td>87 127</td><td>7</td><td>0.6096</td><td>0.4024</td><td>|IIIIIIIIIIII</td><td>0.4280</td><td>|IIIIIIIIIIIII</td></tr>
<tr><td>112 154</td><td>7</td><td>0.4554</td><td>0.3147</td><td>|IIIIIIIII</td><td>0.1656</td><td>|IIIII</td></tr>
<tr><td>114 156</td><td>7</td><td>0.3185</td><td>0.2227</td><td>|IIIIIII</td><td>0.4207</td><td>|IIIIIIIIIIIII</td></tr>
<tr><td>110 152</td><td>8</td><td>0.9074</td><td>0.8261</td><td>|IIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.5773</td><td>|IIIIIIIIIIIIIIIII</td></tr>
</table>

**Membership Summary Section for Clusters = 10**

| Row | Cluster | Cluster Membership | Sum of Squared Memberships | Bar of Squared Memberships | Silhouette Amount | Silhouette Bar |
|---|---|---|---|---|---|---|
| 111 153 | 8 | 0.8587 | 0.7446 | \|IIIIIIIIIIIIIIIIIIIIII | 0.4922 | \|IIIIIIIIIIIIIII |
| 15 21 | 8 | 0.8571 | 0.7408 | \|IIIIIIIIIIIIIIIIIIIIII | 0.5376 | \|IIIIIIIIIIIIIIII |
| 83 122 | 8 | 0.8076 | 0.6630 | \|IIIIIIIIIIIIIIIIIIII | 0.5089 | \|IIIIIIIIIIIIIII |
| 61 90 | 8 | 0.7588 | 0.6030 | \|IIIIIIIIIIIIIIIIII | 0.3513 | \|IIIIIIIIIII |
| 72 104 | 8 | 0.7295 | 0.5600 | \|IIIIIIIIIIIIIIIII | 0.3725 | \|IIIIIIIIIII |
| 5 6 | 8 | 0.7250 | 0.5614 | \|IIIIIIIIIIIIIIIII | 0.3362 | \|IIIIIIIIII |
| 45 67 | 8 | 0.7147 | 0.5335 | \|IIIIIIIIIIIIIIII | 0.4551 | \|IIIIIIIIIIIIII |
| 85 125 | 8 | 0.6178 | 0.4244 | \|IIIIIIIIIIIII | 0.3749 | \|IIIIIIIIIII |
| 17 26 | 8 | 0.5129 | 0.3777 | \|IIIIIIIIIII | 0.1707 | \|IIIII |
| 20 31 | 8 | 0.4740 | 0.3858 | \|IIIIIIIIIIII | 0.1032 | \|III |
| 23 35 | 8 | 0.2927 | 0.1928 | \|IIIIII | 0.0557 | \|II |
| 9 12 | 9 | 0.8775 | 0.7746 | \|IIIIIIIIIIIIIIIIIIIIIII | 0.5365 | \|IIIIIIIIIIIIIIII |
| 95 135 | 9 | 0.8617 | 0.7478 | \|IIIIIIIIIIIIIIIIIIIIII | 0.5462 | \|IIIIIIIIIIIIIIII |
| 99 140 | 9 | 0.7976 | 0.6525 | \|IIIIIIIIIIIIIIIIIIII | 0.4273 | \|IIIIIIIIIIIII |
| 22 34 | 9 | 0.7678 | 0.6135 | \|IIIIIIIIIIIIIIIIII | 0.3939 | \|IIIIIIIIIIII |
| 71 103 | 9 | 0.7383 | 0.5658 | \|IIIIIIIIIIIIIIIII | 0.3789 | \|IIIIIIIIIII |
| 107 149 | 9 | 0.6851 | 0.5226 | \|IIIIIIIIIIIIIIII | 0.3329 | \|IIIIIIIIII |
| 76 113 | 9 | 0.6739 | 0.4814 | \|IIIIIIIIIIIIII | 0.3980 | \|IIIIIIIIIIII |
| 4 4 | 9 | 0.5984 | 0.4027 | \|IIIIIIIIIIII | 0.4943 | \|IIIIIIIIIIIIIII |
| 109 151 | 9 | 0.5962 | 0.4304 | \|IIIIIIIIIIIII | 0.3830 | \|IIIIIIIIIII |
| 55 83 | 9 | 0.5936 | 0.4105 | \|IIIIIIIIIIII | 0.2506 | \|IIIIIIII |
| 37 55 | 9 | 0.5884 | 0.4322 | \|IIIIIIIIIIIII | 0.3470 | \|IIIIIIIIII |
| 105 147 | 9 | 0.5704 | 0.3867 | \|IIIIIIIIIIII | 0.3373 | \|IIIIIIIIII |
| 98 139 | 9 | 0.4082 | 0.2617 | \|IIIIIIII | 0.3582 | \|IIIIIIIIIII |
| 79 117 | 9 | 0.3876 | 0.2888 | \|IIIIIIIII | 0.1165 | \|III |
| 25 37 | 9 | 0.3849 | 0.2453 | \|IIIIIII | 0.1762 | \|IIIII |
| 51 75 | 9 | 0.3804 | 0.2663 | \|IIIIIIII | 0.0809 | \|II |
| 30 42 | 9 | 0.3790 | 0.2336 | \|IIIIIII | 0.2786 | \|IIIIIIII |
| 35 52 | 9 | 0.3748 | 0.2945 | \|IIIIIIIII | 0.0243 | \|I |
| 92 132 | 9 | 0.2817 | 0.1932 | \|IIIIII | 0.2272 | \|IIIIIII |
| 28 40 | 9 | 0.2582 | 0.1837 | \|IIIIII | 0.2384 | \|IIIIIII |
| 40 60 | 10 | 0.8619 | 0.7475 | \|IIIIIIIIIIIIIIIIIIIIII | 0.4940 | \|IIIIIIIIIIIIIII |
| 3 3 | 10 | 0.8317 | 0.6989 | \|IIIIIIIIIIIIIIIIIIIII | 0.4705 | \|IIIIIIIIIIIIII |
| 118 163 | 10 | 0.7927 | 0.6361 | \|IIIIIIIIIIIIIIIIIII | 0.5181 | \|IIIIIIIIIIIIIIII |
| 121 168 | 10 | 0.7439 | 0.5687 | \|IIIIIIIIIIIIIIIII | 0.4597 | \|IIIIIIIIIIIIII |
| 58 86 | 10 | 0.7267 | 0.5417 | \|IIIIIIIIIIIIIIII | 0.4707 | \|IIIIIIIIIIIIII |
| 16 22 | 10 | 0.6866 | 0.5022 | \|IIIIIIIIIIIIIII | 0.2553 | \|IIIIIIII |
| 26 38 | 10 | 0.6472 | 0.4610 | \|IIIIIIIIIIIIII | 0.2541 | \|IIIIIIII |
| 66 97 | 10 | 0.6408 | 0.4327 | \|IIIIIIIIIIIII | 0.4187 | \|IIIIIIIIIIIII |
| 44 65 | 10 | 0.6363 | 0.4319 | \|IIIIIIIIIIIII | 0.3448 | \|IIIIIIIIII |
| 122 171 | 10 | 0.5729 | 0.3909 | \|IIIIIIIIIIII | 0.2347 | \|IIIIIII |
| 27 39 | 10 | 0.5419 | 0.3303 | \|IIIIIIIIII | 0.3557 | \|IIIIIIIIIII |

**Membership Summary Section for Clusters = 10**

<table>
<tr><th>Row</th><th>Cluster</th><th>Cluster Membership</th><th>Sum of Squared Memberships</th><th>Bar of Squared Memberships</th><th>Silhouette Amount</th><th>Silhouette Bar</th></tr>
<tr><td>14 20</td><td>10</td><td>0.4263</td><td>0.2922</td><td>|||||||||||</td><td>0.0603</td><td>|||</td></tr>
<tr><td>56 84</td><td>10</td><td>0.3956</td><td>0.2007</td><td>|||||||</td><td>0.4191</td><td>|||||||||||||||</td></tr>
<tr><td>89 129</td><td>10</td><td>0.3472</td><td>0.2357</td><td>||||||||</td><td>-0.0430</td><td>|</td></tr>
<tr><td>53 80</td><td>10</td><td>0.2855</td><td>0.1990</td><td>|||||||</td><td>-0.0547</td><td>|</td></tr>
</table>

**Membership Matrix Section**

| Row | Cluster | Prob in 1 | Prob in 2 | Prob in 3 | Prob in 4 | Prob in 5 | Prob in 6 |
|---|---|---|---|---|---|---|---|
| 1 1 | 4 | 0.2240 | 0.0121 | 0.0274 | 0.5778 | 0.0047 | 0.0517 |
| 2 2 | 4 | 0.0602 | 0.0085 | 0.0187 | 0.7948 | 0.0033 | 0.0345 |
| 3 3 | 10 | 0.0062 | 0.0063 | 0.0593 | 0.0159 | 0.0046 | 0.0046 |
| 4 4 | 9 | 0.0406 | 0.0090 | 0.1777 | 0.0934 | 0.0040 | 0.0095 |
| 5 6 | 8 | 0.0032 | 0.0667 | 0.0044 | 0.0047 | 0.0060 | 0.0026 |
| 6 7 | 4 | 0.3512 | 0.0120 | 0.0255 | 0.4809 | 0.0041 | 0.0294 |
| 7 10 | 4 | 0.2059 | 0.0181 | 0.1018 | 0.3034 | 0.0069 | 0.0227 |
| 8 11 | 6 | 0.0359 | 0.0100 | 0.0094 | 0.0457 | 0.0040 | 0.8550 |
| 9 12 | 9 | 0.0059 | 0.0022 | 0.0576 | 0.0212 | 0.0011 | 0.0023 |
| 10 13 | 1 | 0.9087 | 0.0049 | 0.0093 | 0.0354 | 0.0018 | 0.0100 |
| 11 14 | 1 | 0.3933 | 0.0169 | 0.0260 | 0.3911 | 0.0057 | 0.0650 |
| 12 15 | 4 | 0.0430 | 0.0214 | 0.0717 | 0.3733 | 0.0089 | 0.0325 |
| 13 19 | 7 | 0.0031 | 0.0407 | 0.0054 | 0.0048 | 0.0114 | 0.0027 |
| 14 20 | 10 | 0.0174 | 0.0094 | 0.1948 | 0.0521 | 0.0061 | 0.0110 |
| 15 21 | 8 | 0.0042 | 0.0450 | 0.0053 | 0.0056 | 0.0051 | 0.0029 |
| 16 22 | 10 | 0.0109 | 0.0073 | 0.0793 | 0.0377 | 0.0045 | 0.0079 |
| 17 26 | 8 | 0.0047 | 0.1240 | 0.0065 | 0.0072 | 0.0094 | 0.0040 |
| 18 27 | 6 | 0.0968 | 0.1080 | 0.0849 | 0.0994 | 0.1066 | 0.1334 |
| 19 29 | 4 | 0.0781 | 0.0320 | 0.0433 | 0.4537 | 0.0123 | 0.1697 |
| 20 31 | 8 | 0.0044 | 0.0881 | 0.0064 | 0.0066 | 0.0093 | 0.0037 |
| 21 32 | 7 | 0.0048 | 0.0958 | 0.0077 | 0.0077 | 0.0234 | 0.0049 |
| 22 34 | 9 | 0.0065 | 0.0028 | 0.1459 | 0.0195 | 0.0015 | 0.0028 |
| 23 35 | 8 | 0.0644 | 0.2851 | 0.0368 | 0.0633 | 0.0288 | 0.0425 |
| 24 36 | 6 | 0.0587 | 0.1086 | 0.0441 | 0.1112 | 0.0475 | 0.3687 |
| 25 37 | 9 | 0.0344 | 0.0132 | 0.1049 | 0.2001 | 0.0067 | 0.0211 |
| 26 38 | 10 | 0.0090 | 0.0066 | 0.1382 | 0.0251 | 0.0043 | 0.0058 |
| 27 39 | 10 | 0.0275 | 0.0277 | 0.0710 | 0.1045 | 0.0158 | 0.0326 |
| 28 40 | 9 | 0.2201 | 0.0223 | 0.1730 | 0.1795 | 0.0099 | 0.0265 |
| 29 41 | 4 | 0.0461 | 0.0096 | 0.0178 | 0.8155 | 0.0032 | 0.0247 |
| 30 42 | 9 | 0.1268 | 0.0154 | 0.1445 | 0.2205 | 0.0065 | 0.0188 |
| 31 43 | 5 | 0.0054 | 0.0299 | 0.0091 | 0.0079 | 0.8462 | 0.0066 |
| 32 46 | 3 | 0.0086 | 0.0051 | 0.7951 | 0.0165 | 0.0036 | 0.0043 |
| 33 47 | 1 | 0.8493 | 0.0056 | 0.0130 | 0.0733 | 0.0022 | 0.0151 |
| 34 49 | 4 | 0.0401 | 0.0116 | 0.0361 | 0.6922 | 0.0047 | 0.0256 |
| 35 52 | 9 | 0.0191 | 0.0102 | 0.1063 | 0.0843 | 0.0055 | 0.0122 |

**Membership Matrix Section**

| Row | Cluster | Prob in 1 | Prob in 2 | Prob in 3 | Prob in 4 | Prob in 5 | Prob in 6 |
|---|---|---|---|---|---|---|---|
| 36 54 | 3 | 0.0047 | 0.0023 | 0.9053 | 0.0085 | 0.0015 | 0.0020 |
| 37 55 | 9 | 0.0159 | 0.0059 | 0.2868 | 0.0368 | 0.0029 | 0.0051 |
| 38 56 | 1 | 0.7159 | 0.0209 | 0.0292 | 0.0814 | 0.0080 | 0.0452 |
| 39 58 | 3 | 0.0036 | 0.0018 | 0.9203 | 0.0067 | 0.0012 | 0.0016 |
| 40 60 | 10 | 0.0057 | 0.0050 | 0.0441 | 0.0156 | 0.0037 | 0.0046 |
| 41 61 | 6 | 0.0889 | 0.0621 | 0.0461 | 0.0942 | 0.0371 | 0.4693 |
| 42 63 | 6 | 0.0645 | 0.0947 | 0.0531 | 0.0963 | 0.0731 | 0.3451 |
| 43 64 | 7 | 0.0030 | 0.0978 | 0.0043 | 0.0046 | 0.0100 | 0.0029 |
| 44 65 | 10 | 0.0187 | 0.0187 | 0.0637 | 0.0721 | 0.0101 | 0.0177 |
| 45 67 | 8 | 0.0128 | 0.1307 | 0.0120 | 0.0156 | 0.0102 | 0.0085 |
| 46 68 | 4 | 0.0383 | 0.0045 | 0.0135 | 0.8716 | 0.0017 | 0.0115 |
| 47 71 | 2 | 0.0105 | 0.7255 | 0.0086 | 0.0145 | 0.0117 | 0.0111 |
| 48 72 | 1 | 0.7637 | 0.0158 | 0.0220 | 0.0741 | 0.0060 | 0.0422 |
| 49 73 | 3 | 0.0069 | 0.0030 | 0.8565 | 0.0124 | 0.0018 | 0.0026 |
| 50 74 | 5 | 0.0585 | 0.0942 | 0.0965 | 0.0708 | 0.2179 | 0.0587 |
| 51 75 | 9 | 0.0428 | 0.0117 | 0.0904 | 0.3129 | 0.0056 | 0.0205 |
| 52 77 | 5 | 0.0307 | 0.2471 | 0.0337 | 0.0455 | 0.2525 | 0.0591 |
| 53 80 | 10 | 0.0448 | 0.0290 | 0.0775 | 0.2660 | 0.0137 | 0.0497 |
| 54 82 | 7 | 0.0057 | 0.0513 | 0.0106 | 0.0084 | 0.0229 | 0.0047 |
| 55 83 | 9 | 0.0102 | 0.0055 | 0.1653 | 0.0332 | 0.0030 | 0.0052 |
| 56 84 | 10 | 0.0332 | 0.0629 | 0.0897 | 0.0740 | 0.0738 | 0.0458 |
| 57 85 | 2 | 0.0056 | 0.6214 | 0.0065 | 0.0082 | 0.0165 | 0.0061 |
| 58 86 | 10 | 0.0119 | 0.0174 | 0.0731 | 0.0295 | 0.0129 | 0.0099 |
| 59 87 | 1 | 0.8347 | 0.0082 | 0.0202 | 0.0605 | 0.0032 | 0.0141 |
| 60 89 | 5 | 0.0190 | 0.0667 | 0.0408 | 0.0275 | 0.5310 | 0.0194 |
| 61 90 | 8 | 0.0030 | 0.0576 | 0.0041 | 0.0043 | 0.0055 | 0.0024 |
| 62 91 | 6 | 0.0185 | 0.0068 | 0.0061 | 0.0258 | 0.0029 | 0.9133 |
| 63 92 | 5 | 0.0493 | 0.1700 | 0.0485 | 0.0655 | 0.2269 | 0.1087 |
| 64 93 | 1 | 0.8100 | 0.0076 | 0.0204 | 0.0835 | 0.0028 | 0.0134 |
| 65 95 | 3 | 0.0203 | 0.0063 | 0.4870 | 0.0400 | 0.0033 | 0.0062 |
| 66 97 | 10 | 0.0158 | 0.0255 | 0.0873 | 0.0393 | 0.0174 | 0.0130 |
| 67 98 | 3 | 0.0074 | 0.0040 | 0.6948 | 0.0172 | 0.0025 | 0.0035 |
| 68 99 | 4 | 0.0930 | 0.0083 | 0.0379 | 0.6864 | 0.0035 | 0.0189 |
| 69 101 | 2 | 0.0096 | 0.7245 | 0.0092 | 0.0133 | 0.0260 | 0.0123 |
| 70 102 | 5 | 0.0216 | 0.0838 | 0.0482 | 0.0314 | 0.3843 | 0.0206 |
| 71 103 | 9 | 0.0093 | 0.0047 | 0.0966 | 0.0342 | 0.0023 | 0.0045 |
| 72 104 | 8 | 0.0059 | 0.0618 | 0.0085 | 0.0082 | 0.0091 | 0.0042 |
| 73 105 | 5 | 0.0077 | 0.0292 | 0.0129 | 0.0110 | 0.8344 | 0.0099 |
| 74 107 | 4 | 0.1368 | 0.0128 | 0.0391 | 0.6246 | 0.0043 | 0.0198 |
| 75 110 | 2 | 0.0083 | 0.4868 | 0.0105 | 0.0132 | 0.0282 | 0.0096 |
| 76 113 | 9 | 0.0290 | 0.0075 | 0.0859 | 0.1281 | 0.0031 | 0.0085 |
| 77 114 | 3 | 0.0257 | 0.0185 | 0.5534 | 0.0419 | 0.0152 | 0.0138 |
| 78 115 | 4 | 0.1207 | 0.0145 | 0.0311 | 0.6720 | 0.0045 | 0.0233 |
| 79 117 | 9 | 0.0712 | 0.0115 | 0.0843 | 0.3509 | 0.0046 | 0.0153 |

**Membership Matrix Section**

| Row | Cluster | Prob in 1 | Prob in 2 | Prob in 3 | Prob in 4 | Prob in 5 | Prob in 6 |
|---|---|---|---|---|---|---|---|
| 80 118 | 7 | 0.0025 | 0.0415 | 0.0041 | 0.0038 | 0.0137 | 0.0024 |
| 81 120 | 5 | 0.0131 | 0.1291 | 0.0194 | 0.0198 | 0.4980 | 0.0173 |
| 82 121 | 2 | 0.0056 | 0.4171 | 0.0068 | 0.0082 | 0.0152 | 0.0056 |
| 83 122 | 8 | 0.0072 | 0.0877 | 0.0073 | 0.0092 | 0.0065 | 0.0049 |
| 84 124 | 3 | 0.0523 | 0.0601 | 0.2046 | 0.0742 | 0.0892 | 0.0403 |
| 85 125 | 8 | 0.0184 | 0.1859 | 0.0158 | 0.0221 | 0.0130 | 0.0122 |
| 86 126 | 3 | 0.0034 | 0.0018 | 0.9138 | 0.0067 | 0.0011 | 0.0015 |
| 87 127 | 7 | 0.0120 | 0.0775 | 0.0248 | 0.0177 | 0.0536 | 0.0098 |
| 88 128 | 5 | 0.0128 | 0.0565 | 0.0175 | 0.0178 | 0.7368 | 0.0189 |
| 89 129 | 10 | 0.0280 | 0.0260 | 0.2969 | 0.0517 | 0.0261 | 0.0200 |
| 90 130 | 6 | 0.0322 | 0.0179 | 0.0126 | 0.0384 | 0.0080 | 0.8336 |
| 91 131 | 2 | 0.0354 | 0.5098 | 0.0248 | 0.0482 | 0.0406 | 0.0606 |
| 92 132 | 9 | 0.2074 | 0.0200 | 0.1521 | 0.2057 | 0.0084 | 0.0240 |
| 93 133 | 7 | 0.0032 | 0.0557 | 0.0049 | 0.0047 | 0.0101 | 0.0028 |
| 94 134 | 6 | 0.0711 | 0.1133 | 0.0660 | 0.0925 | 0.1275 | 0.1985 |
| 95 135 | 9 | 0.0071 | 0.0027 | 0.0560 | 0.0277 | 0.0013 | 0.0028 |
| 96 136 | 2 | 0.0140 | 0.6415 | 0.0117 | 0.0172 | 0.0204 | 0.0144 |
| 97 138 | 2 | 0.0117 | 0.4911 | 0.0108 | 0.0169 | 0.0117 | 0.0104 |
| 98 139 | 9 | 0.0773 | 0.0154 | 0.2669 | 0.1136 | 0.0070 | 0.0154 |
| 99 140 | 9 | 0.0063 | 0.0027 | 0.1167 | 0.0200 | 0.0014 | 0.0027 |
| 100 141 | 6 | 0.0503 | 0.0125 | 0.0135 | 0.0703 | 0.0052 | 0.7920 |
| 101 142 | 6 | 0.0598 | 0.0982 | 0.0430 | 0.0902 | 0.0568 | 0.4141 |
| 102 143 | 1 | 0.5277 | 0.0231 | 0.0309 | 0.1603 | 0.0088 | 0.1359 |
| 103 144 | 5 | 0.0327 | 0.0772 | 0.0643 | 0.0441 | 0.4174 | 0.0341 |
| 104 146 | 6 | 0.0499 | 0.0312 | 0.0240 | 0.1138 | 0.0122 | 0.6513 |
| 105 147 | 9 | 0.0158 | 0.0095 | 0.2153 | 0.0440 | 0.0045 | 0.0069 |
| 106 148 | 7 | 0.0030 | 0.0894 | 0.0042 | 0.0044 | 0.0117 | 0.0029 |
| 107 149 | 9 | 0.0075 | 0.0033 | 0.2248 | 0.0206 | 0.0017 | 0.0030 |
| 108 150 | 3 | 0.0245 | 0.0087 | 0.6496 | 0.0382 | 0.0048 | 0.0077 |
| 109 151 | 9 | 0.0205 | 0.0063 | 0.2655 | 0.0456 | 0.0030 | 0.0059 |
| 110 152 | 8 | 0.0024 | 0.0360 | 0.0029 | 0.0033 | 0.0030 | 0.0018 |
| 111 153 | 8 | 0.0024 | 0.0583 | 0.0029 | 0.0034 | 0.0038 | 0.0019 |
| 112 154 | 7 | 0.0083 | 0.2957 | 0.0110 | 0.0123 | 0.0498 | 0.0094 |
| 113 155 | 2 | 0.0124 | 0.5392 | 0.0104 | 0.0163 | 0.0119 | 0.0109 |
| 114 156 | 7 | 0.0167 | 0.0925 | 0.0349 | 0.0254 | 0.3113 | 0.0167 |
| 115 158 | 4 | 0.1479 | 0.0117 | 0.0214 | 0.6790 | 0.0042 | 0.0495 |
| 116 159 | 7 | 0.0042 | 0.0436 | 0.0073 | 0.0061 | 0.0152 | 0.0035 |
| 117 161 | 6 | 0.1855 | 0.0446 | 0.0368 | 0.1185 | 0.0177 | 0.4434 |
| 118 163 | 10 | 0.0108 | 0.0121 | 0.0473 | 0.0309 | 0.0092 | 0.0110 |
| 119 164 | 4 | 0.0704 | 0.0094 | 0.0587 | 0.5603 | 0.0040 | 0.0171 |
| 120 165 | 5 | 0.0108 | 0.0630 | 0.0146 | 0.0154 | 0.7401 | 0.0160 |
| 121 168 | 10 | 0.0114 | 0.0102 | 0.0893 | 0.0277 | 0.0087 | 0.0095 |
| 122 171 | 10 | 0.0110 | 0.0093 | 0.2056 | 0.0271 | 0.0065 | 0.0070 |
| 123 172 | 4 | 0.0506 | 0.0206 | 0.0389 | 0.6335 | 0.0072 | 0.0431 |

**Membership Matrix Section**

| Row | Cluster | Prob in 7 | Prob in 8 | Prob in 9 | Prob in 10 |
|---|---|---|---|---|---|
| 1 1 | 4 | 0.0087 | 0.0112 | 0.0552 | 0.0272 |
| 2 2 | 4 | 0.0060 | 0.0076 | 0.0430 | 0.0234 |
| 3 3 | 10 | 0.0079 | 0.0068 | 0.0567 | 0.8317 |
| 4 4 | 9 | 0.0087 | 0.0109 | 0.5984 | 0.0479 |
| 5 6 | 8 | 0.1765 | 0.7250 | 0.0052 | 0.0058 |
| 6 7 | 4 | 0.0085 | 0.0119 | 0.0541 | 0.0224 |
| 7 10 | 4 | 0.0154 | 0.0212 | 0.2534 | 0.0513 |
| 8 11 | 6 | 0.0061 | 0.0075 | 0.0145 | 0.0120 |
| 9 12 | 9 | 0.0022 | 0.0025 | 0.8775 | 0.0276 |
| 10 13 | 1 | 0.0036 | 0.0051 | 0.0144 | 0.0068 |
| 11 14 | 1 | 0.0111 | 0.0155 | 0.0495 | 0.0259 |
| 12 15 | 4 | 0.0178 | 0.0201 | 0.2310 | 0.1804 |
| 13 19 | 7 | 0.8493 | 0.0684 | 0.0060 | 0.0082 |
| 14 20 | 10 | 0.0101 | 0.0099 | 0.2628 | 0.4263 |
| 15 21 | 8 | 0.0625 | 0.8571 | 0.0062 | 0.0061 |
| 16 22 | 10 | 0.0077 | 0.0075 | 0.1507 | 0.6866 |
| 17 26 | 8 | 0.3146 | 0.5129 | 0.0077 | 0.0091 |
| 18 27 | 6 | 0.0940 | 0.0935 | 0.0895 | 0.0939 |
| 19 29 | 4 | 0.0213 | 0.0250 | 0.0869 | 0.0778 |
| 20 31 | 8 | 0.3912 | 0.4740 | 0.0075 | 0.0088 |
| 21 32 | 7 | 0.7520 | 0.0822 | 0.0088 | 0.0126 |
| 22 34 | 9 | 0.0030 | 0.0032 | 0.7678 | 0.0470 |
| 23 35 | 8 | 0.0996 | 0.2927 | 0.0475 | 0.0391 |
| 24 36 | 6 | 0.0579 | 0.0589 | 0.0625 | 0.0819 |
| 25 37 | 9 | 0.0121 | 0.0130 | 0.3849 | 0.2095 |
| 26 38 | 10 | 0.0077 | 0.0073 | 0.1487 | 0.6472 |
| 27 39 | 10 | 0.0259 | 0.0241 | 0.1291 | 0.5419 |
| 28 40 | 9 | 0.0204 | 0.0269 | 0.2582 | 0.0633 |
| 29 41 | 4 | 0.0066 | 0.0086 | 0.0445 | 0.0235 |
| 30 42 | 9 | 0.0139 | 0.0182 | 0.3790 | 0.0564 |
| 31 43 | 5 | 0.0496 | 0.0221 | 0.0092 | 0.0142 |
| 32 46 | 3 | 0.0062 | 0.0060 | 0.0858 | 0.0689 |
| 33 47 | 1 | 0.0042 | 0.0057 | 0.0219 | 0.0099 |
| 34 49 | 4 | 0.0090 | 0.0108 | 0.1109 | 0.0590 |
| 35 52 | 9 | 0.0101 | 0.0104 | 0.3748 | 0.3671 |
| 36 54 | 3 | 0.0027 | 0.0028 | 0.0487 | 0.0216 |
| 37 55 | 9 | 0.0063 | 0.0073 | 0.5884 | 0.0446 |
| 38 56 | 1 | 0.0148 | 0.0211 | 0.0403 | 0.0232 |
| 39 58 | 3 | 0.0021 | 0.0022 | 0.0416 | 0.0189 |
| 40 60 | 10 | 0.0058 | 0.0051 | 0.0484 | 0.8619 |
| 41 61 | 6 | 0.0413 | 0.0453 | 0.0576 | 0.0581 |
| 42 63 | 6 | 0.0619 | 0.0588 | 0.0663 | 0.0862 |
| 43 64 | 7 | 0.7324 | 0.1338 | 0.0050 | 0.0062 |
| 44 65 | 10 | 0.0187 | 0.0176 | 0.1265 | 0.6363 |

**Membership Matrix Section**

| Row | Cluster | Prob in 7 | Prob in 8 | Prob in 9 | Prob in 10 |
|---|---|---|---|---|---|
| 45 67 | 8 | 0.0677 | 0.7147 | 0.0148 | 0.0132 |
| 46 68 | 4 | 0.0033 | 0.0043 | 0.0370 | 0.0143 |
| 47 71 | 2 | 0.0564 | 0.1386 | 0.0113 | 0.0117 |
| 48 72 | 1 | 0.0109 | 0.0154 | 0.0316 | 0.0183 |
| 49 73 | 3 | 0.0035 | 0.0038 | 0.0850 | 0.0244 |
| 50 74 | 5 | 0.1172 | 0.0928 | 0.0859 | 0.1075 |
| 51 75 | 9 | 0.0104 | 0.0118 | 0.3804 | 0.1136 |
| 52 77 | 5 | 0.1380 | 0.0981 | 0.0396 | 0.0555 |
| 53 80 | 10 | 0.0242 | 0.0253 | 0.1844 | 0.2855 |
| 54 82 | 7 | 0.7675 | 0.1039 | 0.0109 | 0.0141 |
| 55 83 | 9 | 0.0060 | 0.0062 | 0.5936 | 0.1716 |
| 56 84 | 10 | 0.0731 | 0.0517 | 0.1004 | 0.3956 |
| 57 85 | 2 | 0.1756 | 0.1429 | 0.0078 | 0.0094 |
| 58 86 | 10 | 0.0237 | 0.0186 | 0.0763 | 0.7267 |
| 59 87 | 1 | 0.0063 | 0.0090 | 0.0307 | 0.0131 |
| 60 89 | 5 | 0.1350 | 0.0649 | 0.0369 | 0.0588 |
| 61 90 | 8 | 0.1543 | 0.7588 | 0.0048 | 0.0053 |
| 62 91 | 6 | 0.0042 | 0.0050 | 0.0092 | 0.0082 |
| 63 92 | 5 | 0.1110 | 0.0928 | 0.0554 | 0.0719 |
| 64 93 | 1 | 0.0058 | 0.0083 | 0.0348 | 0.0134 |
| 65 95 | 3 | 0.0066 | 0.0076 | 0.3775 | 0.0453 |
| 66 97 | 10 | 0.0357 | 0.0279 | 0.0972 | 0.6408 |
| 67 98 | 3 | 0.0047 | 0.0048 | 0.1857 | 0.0754 |
| 68 99 | 4 | 0.0067 | 0.0084 | 0.1059 | 0.0311 |
| 69 101 | 2 | 0.0877 | 0.0928 | 0.0113 | 0.0133 |
| 70 102 | 5 | 0.2095 | 0.0893 | 0.0434 | 0.0679 |
| 71 103 | 9 | 0.0049 | 0.0053 | 0.7383 | 0.1001 |
| 72 104 | 8 | 0.1533 | 0.7295 | 0.0096 | 0.0100 |
| 73 105 | 5 | 0.0400 | 0.0224 | 0.0127 | 0.0196 |
| 74 107 | 4 | 0.0097 | 0.0136 | 0.1079 | 0.0314 |
| 75 110 | 2 | 0.2743 | 0.1393 | 0.0128 | 0.0169 |
| 76 113 | 9 | 0.0069 | 0.0085 | 0.6739 | 0.0488 |
| 77 114 | 3 | 0.0243 | 0.0226 | 0.1371 | 0.1474 |
| 78 115 | 4 | 0.0102 | 0.0147 | 0.0794 | 0.0295 |
| 79 117 | 9 | 0.0099 | 0.0128 | 0.3876 | 0.0519 |
| 80 118 | 7 | 0.8718 | 0.0496 | 0.0044 | 0.0061 |
| 81 120 | 5 | 0.1789 | 0.0712 | 0.0211 | 0.0321 |
| 82 121 | 2 | 0.2942 | 0.2294 | 0.0081 | 0.0098 |
| 83 122 | 8 | 0.0522 | 0.8076 | 0.0090 | 0.0083 |
| 84 124 | 3 | 0.0851 | 0.0674 | 0.1309 | 0.1959 |
| 85 125 | 8 | 0.0773 | 0.6178 | 0.0199 | 0.0175 |
| 86 126 | 3 | 0.0022 | 0.0022 | 0.0468 | 0.0205 |
| 87 127 | 7 | 0.6096 | 0.1382 | 0.0243 | 0.0326 |
| 88 128 | 5 | 0.0584 | 0.0365 | 0.0183 | 0.0264 |

**Membership Matrix Section**

| Row | Cluster | Prob in 7 | Prob in 8 | Prob in 9 | Prob in 10 |
|---|---|---|---|---|---|
| 89 129 | 10 | 0.0347 | 0.0291 | 0.1402 | 0.3472 |
| 90 130 | 6 | 0.0106 | 0.0124 | 0.0176 | 0.0168 |
| 91 131 | 2 | 0.0897 | 0.1225 | 0.0328 | 0.0357 |
| 92 132 | 9 | 0.0179 | 0.0238 | 0.2817 | 0.0590 |
| 93 133 | 7 | 0.7465 | 0.1602 | 0.0054 | 0.0066 |
| 94 134 | 6 | 0.0843 | 0.0766 | 0.0751 | 0.0950 |
| 95 135 | 9 | 0.0027 | 0.0031 | 0.8617 | 0.0348 |
| 96 136 | 2 | 0.0824 | 0.1694 | 0.0143 | 0.0148 |
| 97 138 | 2 | 0.0818 | 0.3369 | 0.0143 | 0.0145 |
| 98 139 | 9 | 0.0151 | 0.0190 | 0.4082 | 0.0620 |
| 99 140 | 9 | 0.0028 | 0.0031 | 0.7976 | 0.0466 |
| 100 141 | 6 | 0.0079 | 0.0096 | 0.0212 | 0.0175 |
| 101 142 | 6 | 0.0561 | 0.0559 | 0.0562 | 0.0697 |
| 102 143 | 1 | 0.0153 | 0.0204 | 0.0479 | 0.0298 |
| 103 144 | 5 | 0.1160 | 0.0745 | 0.0568 | 0.0830 |
| 104 146 | 6 | 0.0183 | 0.0210 | 0.0387 | 0.0397 |
| 105 147 | 9 | 0.0106 | 0.0118 | 0.5704 | 0.1114 |
| 106 148 | 7 | 0.7722 | 0.1011 | 0.0048 | 0.0062 |
| 107 149 | 9 | 0.0035 | 0.0038 | 0.6851 | 0.0467 |
| 108 150 | 3 | 0.0096 | 0.0109 | 0.1969 | 0.0492 |
| 109 151 | 9 | 0.0065 | 0.0077 | 0.5962 | 0.0427 |
| 110 152 | 8 | 0.0363 | 0.9074 | 0.0035 | 0.0035 |
| 111 153 | 8 | 0.0612 | 0.8587 | 0.0035 | 0.0037 |
| 112 154 | 7 | 0.4554 | 0.1288 | 0.0126 | 0.0167 |
| 113 155 | 2 | 0.0702 | 0.3019 | 0.0135 | 0.0132 |
| 114 156 | 7 | 0.3185 | 0.0961 | 0.0337 | 0.0541 |
| 115 158 | 4 | 0.0079 | 0.0104 | 0.0448 | 0.0234 |
| 116 159 | 7 | 0.7989 | 0.1037 | 0.0077 | 0.0098 |
| 117 161 | 6 | 0.0272 | 0.0349 | 0.0512 | 0.0402 |
| 118 163 | 10 | 0.0136 | 0.0115 | 0.0611 | 0.7927 |
| 119 164 | 4 | 0.0079 | 0.0098 | 0.2173 | 0.0452 |
| 120 165 | 5 | 0.0645 | 0.0372 | 0.0156 | 0.0227 |
| 121 168 | 10 | 0.0122 | 0.0105 | 0.0766 | 0.7439 |
| 122 171 | 10 | 0.0117 | 0.0107 | 0.1380 | 0.5729 |
| 123 172 | 4 | 0.0148 | 0.0180 | 0.1019 | 0.0715 |

**Summary Section**

| Number Clusters | Average Distance | Average Silhouette | F(U) | Fc(U) | D(U) | Dc(U) |
|---|---|---|---|---|---|---|
| 2 | 43.780805 | 0.430624 | 0.7824 | 0.5648 | 0.0682 | 0.1363 |
| 3 | 34.594255 | 0.360891 | 0.6691 | 0.5036 | 0.1179 | 0.1769 |
| 4 | 29.496855 | 0.379707 | 0.6323 | 0.5097 | 0.1317 | 0.1756 |
| 5 | 26.166616 | 0.310612 | 0.5514 | 0.4393 | 0.1718 | 0.2148 |
| 6 | 23.394134 | 0.339416 | 0.5600 | 0.4720 | 0.1589 | 0.1907 |
| 7 | 21.643589 | 0.331975 | 0.5275 | 0.4487 | 0.1765 | 0.2059 |
| 8 | 19.918334 | 0.276890 | 0.5189 | 0.4502 | 0.1905 | 0.2177 |
| 9 | 18.656094 | 0.213871 | 0.4728 | 0.4069 | 0.2319 | 0.2609 |
| 10 | 17.597110 | 0.229638 | 0.4648 | 0.4053 | 0.2385 | 0.2649 |

# Appendix A4.4

**Cluster Hold Out sample Report**
**Cluster Medoids Section**

| **Variable** | **Cluster1** | **Cluster2** |
|---|---|---|
| Factor1 | -0.2791 | -0.0155 |
| Factor2 | -0.6245 | 1.5641 |
| Factor3 | 0.0085 | 0.024 |
| Row | 38 116 | 4 16 |

**Membership Summary Section for Clusters = 2**

<table>
<tr><th>Row</th><th>Cluster</th><th>Cluster Membership</th><th>Sum of Squared Memberships</th><th>Bar of Squared Memberships</th><th>Silhouette Amount</th><th>Silhouette Bar</th></tr>
<tr><td>38 116</td><td>1</td><td>0.9340</td><td>0.8767</td><td>|IIIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.5369</td><td>|IIIIIIIIIIIIIIII</td></tr>
<tr><td>2 8</td><td>1</td><td>0.9284</td><td>0.8670</td><td>|IIIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.5518</td><td>|IIIIIIIIIIIIIIIII</td></tr>
<tr><td>31 96</td><td>1</td><td>0.9276</td><td>0.8656</td><td>|IIIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.5555</td><td>|IIIIIIIIIIIIIIIII</td></tr>
<tr><td>21 62</td><td>1</td><td>0.9244</td><td>0.8603</td><td>|IIIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.5416</td><td>|IIIIIIIIIIIIIIII</td></tr>
<tr><td>41 137</td><td>1</td><td>0.9182</td><td>0.8499</td><td>|IIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.5231</td><td>|IIIIIIIIIIIIIIII</td></tr>
<tr><td>45 162</td><td>1</td><td>0.9150</td><td>0.8444</td><td>|IIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.5187</td><td>|IIIIIIIIIIIIIIII</td></tr>
<tr><td>28 81</td><td>1</td><td>0.9115</td><td>0.8386</td><td>|IIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.5440</td><td>|IIIIIIIIIIIIIIII</td></tr>
<tr><td>8 24</td><td>1</td><td>0.9033</td><td>0.8252</td><td>|IIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.5290</td><td>|IIIIIIIIIIIIIIII</td></tr>
<tr><td>3 9</td><td>1</td><td>0.8895</td><td>0.8034</td><td>|IIIIIIIIIIIIIIIIIIIIIIII</td><td>0.5206</td><td>|IIIIIIIIIIIIIIII</td></tr>
<tr><td>27 79</td><td>1</td><td>0.8857</td><td>0.7975</td><td>|IIIIIIIIIIIIIIIIIIIIIIII</td><td>0.4941</td><td>|IIIIIIIIIIIIIII</td></tr>
<tr><td>5 17</td><td>1</td><td>0.8846</td><td>0.7958</td><td>|IIIIIIIIIIIIIIIIIIIIIIII</td><td>0.5123</td><td>|IIIIIIIIIIIIIII</td></tr>
<tr><td>12 33</td><td>1</td><td>0.8803</td><td>0.7892</td><td>|IIIIIIIIIIIIIIIIIIIIIIII</td><td>0.4972</td><td>|IIIIIIIIIIIIIII</td></tr>
<tr><td>6 18</td><td>1</td><td>0.8786</td><td>0.7867</td><td>|IIIIIIIIIIIIIIIIIIIIIIII</td><td>0.5103</td><td>|IIIIIIIIIIIIIII</td></tr>
<tr><td>40 123</td><td>1</td><td>0.8666</td><td>0.7688</td><td>|IIIIIIIIIIIIIIIIIIIIIII</td><td>0.4532</td><td>|IIIIIIIIIIIIII</td></tr>
<tr><td>9 25</td><td>1</td><td>0.8486</td><td>0.7430</td><td>|IIIIIIIIIIIIIIIIIIIIII</td><td>0.4781</td><td>|IIIIIIIIIIIIII</td></tr>
<tr><td>17 51</td><td>1</td><td>0.8184</td><td>0.7027</td><td>|IIIIIIIIIIIIIIIIIIIII</td><td>0.4513</td><td>|IIIIIIIIIIIIII</td></tr>
<tr><td>32 100</td><td>1</td><td>0.8093</td><td>0.6913</td><td>|IIIIIIIIIIIIIIIIIIIII</td><td>0.4387</td><td>|IIIIIIIIIIIII</td></tr>
<tr><td>36 111</td><td>1</td><td>0.8024</td><td>0.6828</td><td>|IIIIIIIIIIIIIIIIIIII</td><td>0.4337</td><td>|IIIIIIIIIIIII</td></tr>
<tr><td>48 169</td><td>1</td><td>0.7963</td><td>0.6756</td><td>|IIIIIIIIIIIIIIIIIIII</td><td>0.4279</td><td>|IIIIIIIIIIIII</td></tr>
<tr><td>37 112</td><td>1</td><td>0.7840</td><td>0.6613</td><td>|IIIIIIIIIIIIIIIIIIII</td><td>0.4281</td><td>|IIIIIIIIIIIII</td></tr>
<tr><td>42 145</td><td>1</td><td>0.7808</td><td>0.6577</td><td>|IIIIIIIIIIIIIIIIIIII</td><td>0.4242</td><td>|IIIIIIIIIIIII</td></tr>
<tr><td>13 44</td><td>1</td><td>0.7662</td><td>0.6418</td><td>|IIIIIIIIIIIIIIIIIII</td><td>0.3970</td><td>|IIIIIIIIIIII</td></tr>
<tr><td>1 5</td><td>1</td><td>0.7473</td><td>0.6223</td><td>|IIIIIIIIIIIIIIIIIII</td><td>0.3806</td><td>|IIIIIIIIIII</td></tr>
<tr><td>14 45</td><td>1</td><td>0.6724</td><td>0.5595</td><td>|IIIIIIIIIIIIIIIII</td><td>0.3295</td><td>|IIIIIIIIII</td></tr>
<tr><td>10 28</td><td>1</td><td>0.6188</td><td>0.5282</td><td>|IIIIIIIIIIIIIIII</td><td>0.2724</td><td>|IIIIIIII</td></tr>
<tr><td>20 59</td><td>1</td><td>0.6026</td><td>0.5210</td><td>|IIIIIIIIIIIIIIII</td><td>0.2248</td><td>|IIIIIII</td></tr>
<tr><td>22 66</td><td>1</td><td>0.5334</td><td>0.5022</td><td>|IIIIIIIIIIIIIII</td><td>0.0937</td><td>|III</td></tr>
<tr><td>33 106</td><td>1</td><td>0.5004</td><td>0.5000</td><td>|IIIIIIIIIIIIIII</td><td>0.0957</td><td>|III</td></tr>
<tr><td>4 16</td><td>2</td><td>0.9290</td><td>0.8680</td><td>|IIIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.3265</td><td>|IIIIIIIIII</td></tr>
<tr><td>35 109</td><td>2</td><td>0.9170</td><td>0.8478</td><td>|IIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.3440</td><td>|IIIIIIIIII</td></tr>
<tr><td>7 23</td><td>2</td><td>0.9155</td><td>0.8452</td><td>|IIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.3624</td><td>|IIIIIIIIIII</td></tr>
<tr><td>47 167</td><td>2</td><td>0.9128</td><td>0.8407</td><td>|IIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.3097</td><td>|IIIIIIIII</td></tr>
<tr><td>46 166</td><td>2</td><td>0.9081</td><td>0.8331</td><td>|IIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.3363</td><td>|IIIIIIIIII</td></tr>
<tr><td>18 53</td><td>2</td><td>0.8965</td><td>0.8144</td><td>|IIIIIIIIIIIIIIIIIIIIIIII</td><td>0.2640</td><td>|IIIIIIII</td></tr>
<tr><td>30 94</td><td>2</td><td>0.8774</td><td>0.7848</td><td>|IIIIIIIIIIIIIIIIIIIIIIII</td><td>0.2742</td><td>|IIIIIIII</td></tr>
</table>

**Membership Summary Section for Clusters = 2**

<table>
<tr><th>Row</th><th>Cluster</th><th>Cluster Membership</th><th>Sum of Squared Memberships</th><th>Bar of Squared Memberships</th><th>Silhouette Amount</th><th>Silhouette Bar</th></tr>
<tr><td>44 160</td><td>2</td><td>0.8696</td><td>0.7732</td><td>|IIIIIIIIIIIIIIIIIIIIIII</td><td>0.2361</td><td>|IIIIIII</td></tr>
<tr><td>34 108</td><td>2</td><td>0.8668</td><td>0.7691</td><td>|IIIIIIIIIIIIIIIIIIIIIII</td><td>0.2896</td><td>|IIIIIIIII</td></tr>
<tr><td>19 57</td><td>2</td><td>0.8593</td><td>0.7582</td><td>|IIIIIIIIIIIIIIIIIIIIIII</td><td>0.3166</td><td>|IIIIIIIII</td></tr>
<tr><td>39 119</td><td>2</td><td>0.8317</td><td>0.7200</td><td>|IIIIIIIIIIIIIIIIIIIIII</td><td>0.2038</td><td>|IIIIII</td></tr>
<tr><td>23 69</td><td>2</td><td>0.8293</td><td>0.7169</td><td>|IIIIIIIIIIIIIIIIIIIIII</td><td>0.3336</td><td>|IIIIIIIIII</td></tr>
<tr><td>25 76</td><td>2</td><td>0.7878</td><td>0.6657</td><td>|IIIIIIIIIIIIIIIIIIII</td><td>0.1737</td><td>|IIIII</td></tr>
<tr><td>29 88</td><td>2</td><td>0.7303</td><td>0.6061</td><td>|IIIIIIIIIIIIIIIIII</td><td>0.1978</td><td>|IIIIII</td></tr>
<tr><td>49 170</td><td>2</td><td>0.7282</td><td>0.6041</td><td>|IIIIIIIIIIIIIIIIII</td><td>0.1094</td><td>|III</td></tr>
<tr><td>15 48</td><td>2</td><td>0.6580</td><td>0.5500</td><td>|IIIIIIIIIIIIIIII</td><td>0.1290</td><td>|IIII</td></tr>
<tr><td>24 70</td><td>2</td><td>0.6511</td><td>0.5456</td><td>|IIIIIIIIIIIIIIII</td><td>0.0355</td><td>|I</td></tr>
<tr><td>16 50</td><td>2</td><td>0.6475</td><td>0.5435</td><td>|IIIIIIIIIIIIIIII</td><td>0.0280</td><td>|I</td></tr>
<tr><td>26 78</td><td>2</td><td>0.5888</td><td>0.5158</td><td>|IIIIIIIIIIIIIII</td><td>-0.0095</td><td>|</td></tr>
<tr><td>43 157</td><td>2</td><td>0.5823</td><td>0.5135</td><td>|IIIIIIIIIIIIIII</td><td>0.0947</td><td>|III</td></tr>
<tr><td>11 30</td><td>2</td><td>0.5299</td><td>0.5018</td><td>|IIIIIIIIIIIIIII</td><td>-0.0542</td><td>|</td></tr>
</table>

**Membership Matrix Section**

| Row | Cluster | Prob in 1 | Prob in 2 |
|---|---|---|---|
| 1 5 | 1 | 0.7473 | 0.2527 |
| 2 8 | 1 | 0.9284 | 0.0716 |
| 3 9 | 1 | 0.8895 | 0.1105 |
| 4 16 | 2 | 0.0710 | 0.9290 |
| 5 17 | 1 | 0.8846 | 0.1154 |
| 6 18 | 1 | 0.8786 | 0.1214 |
| 7 23 | 2 | 0.0845 | 0.9155 |
| 8 24 | 1 | 0.9033 | 0.0967 |
| 9 25 | 1 | 0.8486 | 0.1514 |
| 10 28 | 1 | 0.6188 | 0.3812 |
| 11 30 | 2 | 0.4701 | 0.5299 |
| 12 33 | 1 | 0.8803 | 0.1197 |
| 13 44 | 1 | 0.7662 | 0.2338 |
| 14 45 | 1 | 0.6724 | 0.3276 |
| 15 48 | 2 | 0.3420 | 0.6580 |
| 16 50 | 2 | 0.3525 | 0.6475 |
| 17 51 | 1 | 0.8184 | 0.1816 |
| 18 53 | 2 | 0.1035 | 0.8965 |
| 19 57 | 2 | 0.1407 | 0.8593 |
| 20 59 | 1 | 0.6026 | 0.3974 |
| 21 62 | 1 | 0.9244 | 0.0756 |
| 22 66 | 1 | 0.5334 | 0.4666 |
| 23 69 | 2 | 0.1707 | 0.8293 |
| 24 70 | 2 | 0.3489 | 0.6511 |
| 25 76 | 2 | 0.2122 | 0.7878 |

**Membership Matrix Section**

| Row | Cluster | Prob in 1 | Prob in 2 |
|---|---|---|---|
| 26 78 | 2 | 0.4112 | 0.5888 |
| 27 79 | 1 | 0.8857 | 0.1143 |
| 28 81 | 1 | 0.9115 | 0.0885 |
| 29 88 | 2 | 0.2697 | 0.7303 |
| 30 94 | 2 | 0.1226 | 0.8774 |
| 31 96 | 1 | 0.9276 | 0.0724 |
| 32 100 | 1 | 0.8093 | 0.1907 |
| 33 106 | 1 | 0.5004 | 0.4996 |
| 34 108 | 2 | 0.1332 | 0.8668 |
| 35 109 | 2 | 0.0830 | 0.9170 |
| 36 111 | 1 | 0.8024 | 0.1976 |
| 37 112 | 1 | 0.7840 | 0.2160 |
| 38 116 | 1 | 0.9340 | 0.0660 |
| 39 119 | 2 | 0.1683 | 0.8317 |
| 40 123 | 1 | 0.8666 | 0.1334 |
| 41 137 | 1 | 0.9182 | 0.0818 |
| 42 145 | 1 | 0.7808 | 0.2192 |
| 43 157 | 2 | 0.4177 | 0.5823 |
| 44 160 | 2 | 0.1304 | 0.8696 |
| 45 162 | 1 | 0.9150 | 0.0850 |
| 46 166 | 2 | 0.0919 | 0.9081 |
| 47 167 | 2 | 0.0872 | 0.9128 |
| 48 169 | 1 | 0.7963 | 0.2037 |
| 49 170 | 2 | 0.2718 | 0.7282 |

**Cluster Medoids Section**

| Variable | Cluster1 | Cluster2 | Cluster3 |
|---|---|---|---|
| Factor1 | 0.6248 | 0.2441 | -0.0155 |
| Factor2 | -0.0306 | -1.2773 | 1.5641 |
| Factor3 | 1.2831 | -0.7492 | 0.024 |
| Row | 48 169 | 6 18 | 4 16 |

**Membership Summary Section for Clusters = 3**

<table>
<tr><th>Row</th><th>Cluster</th><th>Cluster Membership</th><th>Sum of Squared Memberships</th><th>Bar of Squared Memberships</th><th>Silhouette Amount</th><th>Silhouette Bar</th></tr>
<tr><td>48 169</td><td>1</td><td>0.9266</td><td>0.8613</td><td>|IIIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.5694</td><td>|IIIIIIIIIIIIIIIII</td></tr>
<tr><td>42 145</td><td>1</td><td>0.9070</td><td>0.8271</td><td>|IIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.5880</td><td>|IIIIIIIIIIIIIIIIII</td></tr>
<tr><td>12 33</td><td>1</td><td>0.8974</td><td>0.8114</td><td>|IIIIIIIIIIIIIIIIIIIIIIII</td><td>0.5036</td><td>|IIIIIIIIIIIIIII</td></tr>
<tr><td>27 79</td><td>1</td><td>0.8926</td><td>0.8035</td><td>|IIIIIIIIIIIIIIIIIIIIIIII</td><td>0.4756</td><td>|IIIIIIIIIIIIII</td></tr>
<tr><td>1 5</td><td>1</td><td>0.8527</td><td>0.7380</td><td>|IIIIIIIIIIIIIIIIIIIIII</td><td>0.4804</td><td>|IIIIIIIIIIIIII</td></tr>
<tr><td>14 45</td><td>1</td><td>0.8460</td><td>0.7275</td><td>|IIIIIIIIIIIIIIIIIIIIII</td><td>0.5655</td><td>|IIIIIIIIIIIIIIIII</td></tr>
<tr><td>28 81</td><td>1</td><td>0.8459</td><td>0.7312</td><td>|IIIIIIIIIIIIIIIIIIIIII</td><td>0.4318</td><td>|IIIIIIIIIIIII</td></tr>
<tr><td>9 25</td><td>1</td><td>0.8448</td><td>0.7276</td><td>|IIIIIIIIIIIIIIIIIIIIII</td><td>0.4396</td><td>|IIIIIIIIIIIII</td></tr>
<tr><td>37 112</td><td>1</td><td>0.7986</td><td>0.6594</td><td>|IIIIIIIIIIIIIIIIIIII</td><td>0.4995</td><td>|IIIIIIIIIIIIIII</td></tr>
<tr><td>5 17</td><td>1</td><td>0.7677</td><td>0.6235</td><td>|IIIIIIIIIIIIIIIIIII</td><td>0.3979</td><td>|IIIIIIIIIIII</td></tr>
<tr><td>2 8</td><td>1</td><td>0.6024</td><td>0.4822</td><td>|IIIIIIIIIIIIII</td><td>0.2111</td><td>|IIIIII</td></tr>
<tr><td>10 28</td><td>1</td><td>0.5807</td><td>0.4253</td><td>|IIIIIIIIIIIII</td><td>0.2485</td><td>|IIIIIII</td></tr>
<tr><td>33 106</td><td>1</td><td>0.5432</td><td>0.4019</td><td>|IIIIIIIIIIII</td><td>0.3478</td><td>|IIIIIIIIII</td></tr>
<tr><td>26 78</td><td>1</td><td>0.4808</td><td>0.3780</td><td>|IIIIIIIIIII</td><td>0.2336</td><td>|IIIIIII</td></tr>
<tr><td>6 18</td><td>2</td><td>0.9039</td><td>0.8223</td><td>|IIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.4360</td><td>|IIIIIIIIIIIII</td></tr>
<tr><td>8 24</td><td>2</td><td>0.8710</td><td>0.7688</td><td>|IIIIIIIIIIIIIIIIIIIIIII</td><td>0.3151</td><td>|IIIIIIIII</td></tr>
<tr><td>32 100</td><td>2</td><td>0.8623</td><td>0.7534</td><td>|IIIIIIIIIIIIIIIIIIIIIII</td><td>0.4471</td><td>|IIIIIIIIIIIII</td></tr>
<tr><td>3 9</td><td>2</td><td>0.8617</td><td>0.7539</td><td>|IIIIIIIIIIIIIIIIIIIIIII</td><td>0.3309</td><td>|IIIIIIIIII</td></tr>
<tr><td>21 62</td><td>2</td><td>0.8480</td><td>0.7340</td><td>|IIIIIIIIIIIIIIIIIIIIII</td><td>0.2397</td><td>|IIIIIII</td></tr>
<tr><td>41 137</td><td>2</td><td>0.8425</td><td>0.7256</td><td>|IIIIIIIIIIIIIIIIIIIIII</td><td>0.2638</td><td>|IIIIIIII</td></tr>
<tr><td>17 51</td><td>2</td><td>0.8352</td><td>0.7120</td><td>|IIIIIIIIIIIIIIIIIIIII</td><td>0.3978</td><td>|IIIIIIIIIIII</td></tr>
<tr><td>13 44</td><td>2</td><td>0.8180</td><td>0.6861</td><td>|IIIIIIIIIIIIIIIIIIIII</td><td>0.4514</td><td>|IIIIIIIIIIIIII</td></tr>
<tr><td>45 162</td><td>2</td><td>0.7964</td><td>0.6612</td><td>|IIIIIIIIIIIIIIIIIIII</td><td>0.2163</td><td>|IIIIII</td></tr>
<tr><td>36 111</td><td>2</td><td>0.7598</td><td>0.6090</td><td>|IIIIIIIIIIIIIIIIII</td><td>0.3631</td><td>|IIIIIIIIIII</td></tr>
<tr><td>38 116</td><td>2</td><td>0.7519</td><td>0.6080</td><td>|IIIIIIIIIIIIIIIIII</td><td>0.1026</td><td>|III</td></tr>
<tr><td>40 123</td><td>2</td><td>0.6208</td><td>0.4756</td><td>|IIIIIIIIIIIIII</td><td>0.0566</td><td>|II</td></tr>
<tr><td>31 96</td><td>2</td><td>0.5757</td><td>0.4683</td><td>|IIIIIIIIIIIIII</td><td>-0.0878</td><td>|</td></tr>
<tr><td>20 59</td><td>2</td><td>0.5564</td><td>0.4080</td><td>|IIIIIIIIIIII</td><td>0.2935</td><td>|IIIIIIIII</td></tr>
<tr><td>22 66</td><td>2</td><td>0.4326</td><td>0.3482</td><td>|IIIIIIIIII</td><td>0.2206</td><td>|IIIIIII</td></tr>
<tr><td>11 30</td><td>2</td><td>0.3670</td><td>0.3355</td><td>|IIIIIIIIII</td><td>0.1131</td><td>|III</td></tr>
<tr><td>4 16</td><td>3</td><td>0.9132</td><td>0.8379</td><td>|IIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.3390</td><td>|IIIIIIIIII</td></tr>
<tr><td>47 167</td><td>3</td><td>0.8995</td><td>0.8141</td><td>|IIIIIIIIIIIIIIIIIIIIIIII</td><td>0.3971</td><td>|IIIIIIIIIIII</td></tr>
<tr><td>35 109</td><td>3</td><td>0.8967</td><td>0.8094</td><td>|IIIIIIIIIIIIIIIIIIIIIIII</td><td>0.4141</td><td>|IIIIIIIIIIII</td></tr>
<tr><td>7 23</td><td>3</td><td>0.8871</td><td>0.7937</td><td>|IIIIIIIIIIIIIIIIIIIIIIII</td><td>0.3570</td><td>|IIIIIIIIIII</td></tr>
<tr><td>46 166</td><td>3</td><td>0.8742</td><td>0.7722</td><td>|IIIIIIIIIIIIIIIIIIIIIII</td><td>0.3823</td><td>|IIIIIIIIIII</td></tr>
<tr><td>18 53</td><td>3</td><td>0.8677</td><td>0.7616</td><td>|IIIIIIIIIIIIIIIIIIIIIII</td><td>0.3654</td><td>|IIIIIIIIIII</td></tr>
<tr><td>44 160</td><td>3</td><td>0.8119</td><td>0.6783</td><td>|IIIIIIIIIIIIIIIIIIII</td><td>0.2301</td><td>|IIIIIII</td></tr>
<tr><td>30 94</td><td>3</td><td>0.8057</td><td>0.6706</td><td>|IIIIIIIIIIIIIIIIIIII</td><td>0.2152</td><td>|IIIIII</td></tr>
<tr><td>19 57</td><td>3</td><td>0.7929</td><td>0.6502</td><td>|IIIIIIIIIIIIIIIIIIII</td><td>0.3707</td><td>|IIIIIIIIIII</td></tr>
<tr><td>34 108</td><td>3</td><td>0.7723</td><td>0.6263</td><td>|IIIIIIIIIIIIIIIIIII</td><td>0.1940</td><td>|IIIIII</td></tr>
<tr><td>39 119</td><td>3</td><td>0.7218</td><td>0.5657</td><td>|IIIIIIIIIIIIIIIII</td><td>0.1191</td><td>|IIII</td></tr>
<tr><td>23 69</td><td>3</td><td>0.7102</td><td>0.5495</td><td>|IIIIIIIIIIIIIIII</td><td>0.2532</td><td>|IIIIIIII</td></tr>
</table>

**Membership Summary Section for Clusters = 3**

<table>
<tr><th>Row</th><th>Cluster</th><th>Cluster Membership</th><th>Sum of Squared Memberships</th><th>Bar of Squared Memberships</th><th>Silhouette Amount</th><th>Silhouette Bar</th></tr>
<tr><td>25 76</td><td>3</td><td>0.7002</td><td>0.5370</td><td>|IIIIIIIIIIIIIIII</td><td>0.2800</td><td>|IIIIIIII</td></tr>
<tr><td>49 170</td><td>3</td><td>0.6114</td><td>0.4544</td><td>|IIIIIIIIIIIIII</td><td>0.2085</td><td>|IIIIII</td></tr>
<tr><td>29 88</td><td>3</td><td>0.5734</td><td>0.4215</td><td>|IIIIIIIIIIIII</td><td>0.1628</td><td>|IIIII</td></tr>
<tr><td>16 50</td><td>3</td><td>0.5007</td><td>0.3884</td><td>|IIIIIIIIIIII</td><td>0.1078</td><td>|III</td></tr>
<tr><td>24 70</td><td>3</td><td>0.4910</td><td>0.3896</td><td>|IIIIIIIIIIII</td><td>0.0738</td><td>|II</td></tr>
<tr><td>15 48</td><td>3</td><td>0.4450</td><td>0.3721</td><td>|IIIIIIIIIII</td><td>-0.0965</td><td>|</td></tr>
<tr><td>43 157</td><td>3</td><td>0.3913</td><td>0.3386</td><td>|IIIIIIIIII</td><td>0.0069</td><td>|</td></tr>
</table>

**Membership Matrix Section**

| Row | Cluster | Prob in 1 | Prob in 2 | Prob in 3 |
|---|---|---|---|---|
| 1 5 | 1 | 0.8527 | 0.0815 | 0.0658 |
| 2 8 | 1 | 0.6024 | 0.3407 | 0.0569 |
| 3 9 | 2 | 0.0995 | 0.8617 | 0.0388 |
| 4 16 | 3 | 0.0542 | 0.0326 | 0.9132 |
| 5 17 | 1 | 0.7677 | 0.1763 | 0.0560 |
| 6 18 | 2 | 0.0662 | 0.9039 | 0.0299 |
| 7 23 | 3 | 0.0712 | 0.0417 | 0.8871 |
| 8 24 | 2 | 0.0945 | 0.8710 | 0.0345 |
| 9 25 | 1 | 0.8448 | 0.1087 | 0.0465 |
| 10 28 | 1 | 0.5807 | 0.2200 | 0.1993 |
| 11 30 | 2 | 0.3019 | 0.3670 | 0.3311 |
| 12 33 | 1 | 0.8974 | 0.0718 | 0.0308 |
| 13 44 | 2 | 0.1051 | 0.8180 | 0.0769 |
| 14 45 | 1 | 0.8460 | 0.0763 | 0.0777 |
| 15 48 | 3 | 0.3777 | 0.1773 | 0.4450 |
| 16 50 | 3 | 0.1690 | 0.3303 | 0.5007 |
| 17 51 | 2 | 0.1044 | 0.8352 | 0.0605 |
| 18 53 | 3 | 0.0647 | 0.0676 | 0.8677 |
| 19 57 | 3 | 0.0968 | 0.1104 | 0.7929 |
| 20 59 | 2 | 0.2280 | 0.5564 | 0.2157 |
| 21 62 | 2 | 0.1172 | 0.8480 | 0.0349 |
| 22 66 | 2 | 0.2899 | 0.4326 | 0.2775 |
| 23 69 | 3 | 0.1845 | 0.1053 | 0.7102 |
| 24 70 | 3 | 0.1570 | 0.3520 | 0.4910 |
| 25 76 | 3 | 0.1197 | 0.1801 | 0.7002 |
| 26 78 | 1 | 0.4808 | 0.1821 | 0.3372 |
| 27 79 | 1 | 0.8926 | 0.0756 | 0.0317 |
| 28 81 | 1 | 0.8459 | 0.1205 | 0.0335 |
| 29 88 | 3 | 0.1843 | 0.2423 | 0.5734 |
| 30 94 | 3 | 0.1327 | 0.0616 | 0.8057 |
| 31 96 | 2 | 0.3652 | 0.5757 | 0.0591 |
| 32 100 | 2 | 0.0836 | 0.8623 | 0.0541 |

**Membership Matrix Section**

| Row | Cluster | Prob in 1 | Prob in 2 | Prob in 3 |
|---|---|---|---|---|
| 33 106 | 1 | 0.5432 | 0.1931 | 0.2636 |
| 34 108 | 3 | 0.1582 | 0.0695 | 0.7723 |
| 35 109 | 3 | 0.0535 | 0.0498 | 0.8967 |
| 36 111 | 2 | 0.1581 | 0.7598 | 0.0821 |
| 37 112 | 1 | 0.7986 | 0.1265 | 0.0749 |
| 38 116 | 2 | 0.2011 | 0.7519 | 0.0470 |
| 39 119 | 3 | 0.1938 | 0.0843 | 0.7218 |
| 40 123 | 2 | 0.2854 | 0.6208 | 0.0939 |
| 41 137 | 2 | 0.1198 | 0.8425 | 0.0377 |
| 42 145 | 1 | 0.9070 | 0.0542 | 0.0388 |
| 43 157 | 3 | 0.2936 | 0.3151 | 0.3913 |
| 44 160 | 3 | 0.1211 | 0.0670 | 0.8119 |
| 45 162 | 2 | 0.1576 | 0.7964 | 0.0461 |
| 46 166 | 3 | 0.0681 | 0.0576 | 0.8742 |
| 47 167 | 3 | 0.0523 | 0.0482 | 0.8995 |
| 48 169 | 1 | 0.9266 | 0.0428 | 0.0306 |
| 49 170 | 3 | 0.1440 | 0.2446 | 0.6114 |

**Cluster Medoids Section**

| Variable | Cluster1 | Cluster2 | Cluster3 | Cluster4 |
|---|---|---|---|---|
| Factor1 | 0.6248 | 0.2441 | -0.5879 | 0.3822 |
| Factor2 | -0.0306 | -1.2773 | 1.6774 | 1.1491 |
| Factor3 | 1.2831 | -0.7492 | 0.6984 | -0.84 |
| Row | 48 169 | 6 18 | 30 94 | 18 53 |

**Membership Summary Section for Clusters = 4**

| Row | Cluster | Cluster Membership | Sum of Squared Memberships | Bar of Squared Memberships | Silhouette Amount | Silhouette Bar |
|---|---|---|---|---|---|---|
| 48 169 | 1 | 0.9227 | 0.8534 | |IIIIIIIIIIIIIIIIIIIIIIIIII | 0.6066 | |IIIIIIIIIIIIIIIIII |
| 12 33 | 1 | 0.9163 | 0.8424 | |IIIIIIIIIIIIIIIIIIIIIIIII | 0.5519 | |IIIIIIIIIIIIIIIII |
| 27 79 | 1 | 0.9106 | 0.8325 | |IIIIIIIIIIIIIIIIIIIIIIIII | 0.5242 | |IIIIIIIIIIIIIIII |
| 42 145 | 1 | 0.8977 | 0.8095 | |IIIIIIIIIIIIIIIIIIIIIIII | 0.6192 | |IIIIIIIIIIIIIIIIIII |
| 28 81 | 1 | 0.8739 | 0.7714 | |IIIIIIIIIIIIIIIIIIIIIII | 0.4787 | |IIIIIIIIIIIIII |
| 9 25 | 1 | 0.8407 | 0.7168 | |IIIIIIIIIIIIIIIIIIIIII | 0.4768 | |IIIIIIIIIIIIII |
| 1 5 | 1 | 0.8189 | 0.6817 | |IIIIIIIIIIIIIIIIIIII | 0.5122 | |IIIIIIIIIIIIIII |
| 14 45 | 1 | 0.7853 | 0.6329 | |IIIIIIIIIIIIIIIIIII | 0.5265 | |IIIIIIIIIIIIIIII |
| 5 17 | 1 | 0.7813 | 0.6324 | |IIIIIIIIIIIIIIIIIII | 0.4368 | |IIIIIIIIIIIII |
| 37 112 | 1 | 0.7749 | 0.6187 | |IIIIIIIIIIIIIIIIIII | 0.5271 | |IIIIIIIIIIIIIIII |
| 2 8 | 1 | 0.6194 | 0.4731 | |IIIIIIIIIIIIII | 0.2379 | |IIIIIII |
| 10 28 | 1 | 0.4872 | 0.3259 | |IIIIIIIIII | 0.2674 | |IIIIIIII |
| 33 106 | 1 | 0.3900 | 0.2958 | |IIIIIIIII | 0.0836 | |III |
| 6 18 | 2 | 0.9020 | 0.8174 | |IIIIIIIIIIIIIIIIIIIIIIIII | 0.4767 | |IIIIIIIIIIIIII |
| 8 24 | 2 | 0.8865 | 0.7915 | |IIIIIIIIIIIIIIIIIIIIIIII | 0.3653 | |IIIIIIIIIII |
| 3 9 | 2 | 0.8750 | 0.7723 | |IIIIIIIIIIIIIIIIIIIIIII | 0.3799 | |IIIIIIIIIII |
| 21 62 | 2 | 0.8596 | 0.7484 | |IIIIIIIIIIIIIIIIIIIIII | 0.2857 | |IIIIIIIII |
| 32 100 | 2 | 0.8426 | 0.7191 | |IIIIIIIIIIIIIIIIIIIIII | 0.4850 | |IIIIIIIIIIIIIII |
| 17 51 | 2 | 0.8226 | 0.6883 | |IIIIIIIIIIIIIIIIIIIII | 0.4385 | |IIIIIIIIIIIII |
| 41 137 | 2 | 0.8175 | 0.6837 | |IIIIIIIIIIIIIIIIIIIII | 0.2962 | |IIIIIIIII |
| 13 44 | 2 | 0.7680 | 0.6094 | |IIIIIIIIIIIIIIIIII | 0.4775 | |IIIIIIIIIIIIII |
| 45 162 | 2 | 0.7588 | 0.6033 | |IIIIIIIIIIIIIIIIII | 0.2415 | |IIIIIII |
| 38 116 | 2 | 0.7372 | 0.5808 | |IIIIIIIIIIIIIIIII | 0.1309 | |IIII |
| 36 111 | 2 | 0.6806 | 0.5019 | |IIIIIIIIIIIIIII | 0.3712 | |IIIIIIIIIII |
| 31 96 | 2 | 0.5546 | 0.4350 | |IIIIIIIIIIIII | -0.0839 | | |
| 40 123 | 2 | 0.5430 | 0.3895 | |IIIIIIIIIIII | 0.0621 | |II |
| 20 59 | 2 | 0.3978 | 0.3002 | |IIIIIIIII | 0.2212 | |IIIIIII |
| 22 66 | 2 | 0.3118 | 0.2642 | |IIIIIIII | 0.0489 | |I |
| 30 94 | 3 | 0.9292 | 0.8654 | |IIIIIIIIIIIIIIIIIIIIIIIIII | 0.4731 | |IIIIIIIIIIIIII |
| 34 108 | 3 | 0.9064 | 0.8251 | |IIIIIIIIIIIIIIIIIIIIIIIII | 0.4989 | |IIIIIIIIIIIIIII |
| 39 119 | 3 | 0.8707 | 0.7645 | |IIIIIIIIIIIIIIIIIIIIIII | 0.3873 | |IIIIIIIIIIII |
| 7 23 | 3 | 0.8692 | 0.7644 | |IIIIIIIIIIIIIIIIIIIIIII | 0.4365 | |IIIIIIIIIIIII |
| 44 160 | 3 | 0.8073 | 0.6680 | |IIIIIIIIIIIIIIIIIIII | 0.3475 | |IIIIIIIIII |
| 4 16 | 3 | 0.7627 | 0.6148 | |IIIIIIIIIIIIIIIIII | 0.3044 | |IIIIIIIII |
| 23 69 | 3 | 0.6430 | 0.4685 | |IIIIIIIIIIIIII | 0.3833 | |IIIIIIIIIIII |
| 15 48 | 3 | 0.5107 | 0.3465 | |IIIIIIIIII | 0.2650 | |IIIIIIII |
| 26 78 | 3 | 0.3772 | 0.2907 | |IIIIIIIII | -0.0127 | | |
| 18 53 | 4 | 0.8401 | 0.7174 | |IIIIIIIIIIIIIIIIIIIIII | 0.1729 | |IIIII |
| 35 109 | 4 | 0.8071 | 0.6710 | |IIIIIIIIIIIIIIIIIIII | 0.1344 | |IIII |
| 19 57 | 4 | 0.8018 | 0.6594 | |IIIIIIIIIIIIIIIIIIII | 0.2835 | |IIIIIIIII |
| 25 76 | 4 | 0.7511 | 0.5869 | |IIIIIIIIIIIIIIIIII | 0.2396 | |IIIIIII |
| 46 166 | 4 | 0.7251 | 0.5662 | |IIIIIIIIIIIIIIIII | 0.0702 | |II |

**Membership Summary Section for Clusters = 4**

<table>
<tr><th>Row</th><th>Cluster</th><th>Cluster Membership</th><th>Sum of Squared Memberships</th><th>Bar of Squared Memberships</th><th>Silhouette Amount</th><th>Silhouette Bar</th></tr>
<tr><td>49 170</td><td>4</td><td>0.6901</td><td>0.5099</td><td>|IIIIIIIIIIIIIII</td><td>0.1744</td><td>|IIIII</td></tr>
<tr><td>47 167</td><td>4</td><td>0.6818</td><td>0.5237</td><td>|IIIIIIIIIIIIIIII</td><td>-0.0162</td><td>|</td></tr>
<tr><td>24 70</td><td>4</td><td>0.6445</td><td>0.4614</td><td>|IIIIIIIIIIIIII</td><td>0.0975</td><td>|III</td></tr>
<tr><td>29 88</td><td>4</td><td>0.6287</td><td>0.4432</td><td>|IIIIIIIIIIIII</td><td>0.2992</td><td>|IIIIIIIII</td></tr>
<tr><td>16 50</td><td>4</td><td>0.5848</td><td>0.4029</td><td>|IIIIIIIIIIII</td><td>0.0696</td><td>|II</td></tr>
<tr><td>11 30</td><td>4</td><td>0.3450</td><td>0.2637</td><td>|IIIIIIII</td><td>-0.0095</td><td>|</td></tr>
<tr><td>43 157</td><td>4</td><td>0.3447</td><td>0.2628</td><td>|IIIIIIII</td><td>0.1401</td><td>|IIII</td></tr>
</table>

**Membership Matrix Section**

| Row | Cluster | Prob in 1 | Prob in 2 | Prob in 3 | Prob in 4 |
|---|---|---|---|---|---|
| 1 5 | 1 | 0.8189 | 0.0683 | 0.0617 | 0.0510 |
| 2 8 | 1 | 0.6194 | 0.2924 | 0.0420 | 0.0462 |
| 3 9 | 2 | 0.0712 | 0.8750 | 0.0205 | 0.0333 |
| 4 16 | 3 | 0.0377 | 0.0231 | 0.7627 | 0.1766 |
| 5 17 | 1 | 0.7813 | 0.1363 | 0.0439 | 0.0385 |
| 6 18 | 2 | 0.0504 | 0.9020 | 0.0159 | 0.0317 |
| 7 23 | 3 | 0.0258 | 0.0156 | 0.8692 | 0.0895 |
| 8 24 | 2 | 0.0667 | 0.8865 | 0.0177 | 0.0291 |
| 9 25 | 1 | 0.8407 | 0.0847 | 0.0377 | 0.0369 |
| 10 28 | 1 | 0.4872 | 0.1770 | 0.1480 | 0.1878 |
| 11 30 | 4 | 0.2129 | 0.2492 | 0.1929 | 0.3450 |
| 12 33 | 1 | 0.9163 | 0.0453 | 0.0211 | 0.0173 |
| 13 44 | 2 | 0.0884 | 0.7680 | 0.0444 | 0.0993 |
| 14 45 | 1 | 0.7853 | 0.0663 | 0.0943 | 0.0541 |
| 15 48 | 3 | 0.2119 | 0.1049 | 0.5107 | 0.1725 |
| 16 50 | 4 | 0.0964 | 0.1789 | 0.1399 | 0.5848 |
| 17 51 | 2 | 0.0809 | 0.8226 | 0.0341 | 0.0624 |
| 18 53 | 4 | 0.0305 | 0.0307 | 0.0987 | 0.8401 |
| 19 57 | 4 | 0.0403 | 0.0444 | 0.1134 | 0.8018 |
| 20 59 | 2 | 0.1790 | 0.3978 | 0.1107 | 0.3124 |
| 21 62 | 2 | 0.0903 | 0.8596 | 0.0192 | 0.0309 |
| 22 66 | 2 | 0.2166 | 0.3118 | 0.1692 | 0.3024 |
| 23 69 | 3 | 0.0938 | 0.0556 | 0.6430 | 0.2077 |
| 24 70 | 4 | 0.0792 | 0.1664 | 0.1099 | 0.6445 |
| 25 76 | 4 | 0.0542 | 0.0773 | 0.1174 | 0.7511 |
| 26 78 | 3 | 0.3161 | 0.1263 | 0.3772 | 0.1804 |
| 27 79 | 1 | 0.9106 | 0.0490 | 0.0215 | 0.0189 |
| 28 81 | 1 | 0.8739 | 0.0817 | 0.0226 | 0.0218 |
| 29 88 | 4 | 0.0948 | 0.1191 | 0.1575 | 0.6287 |
| 30 94 | 3 | 0.0220 | 0.0107 | 0.9292 | 0.0381 |
| 31 96 | 2 | 0.3505 | 0.5546 | 0.0423 | 0.0526 |
| 32 100 | 2 | 0.0659 | 0.8426 | 0.0296 | 0.0618 |

**Membership Matrix Section**

| Row | Cluster | Prob in 1 | Prob in 2 | Prob in 3 | Prob in 4 |
|---|---|---|---|---|---|
| 33 106 | 1 | 0.3900 | 0.1443 | 0.3178 | 0.1479 |
| 34 108 | 3 | 0.0306 | 0.0142 | 0.9064 | 0.0487 |
| 35 109 | 4 | 0.0309 | 0.0282 | 0.1337 | 0.8071 |
| 36 111 | 2 | 0.1479 | 0.6806 | 0.0533 | 0.1182 |
| 37 112 | 1 | 0.7749 | 0.1019 | 0.0741 | 0.0492 |
| 38 116 | 2 | 0.1848 | 0.7372 | 0.0301 | 0.0478 |
| 39 119 | 3 | 0.0472 | 0.0215 | 0.8707 | 0.0606 |
| 40 123 | 2 | 0.2772 | 0.5430 | 0.0606 | 0.1193 |
| 41 137 | 2 | 0.1121 | 0.8175 | 0.0238 | 0.0466 |
| 42 145 | 1 | 0.8977 | 0.0407 | 0.0377 | 0.0239 |
| 43 157 | 4 | 0.2012 | 0.2126 | 0.2415 | 0.3447 |
| 44 160 | 3 | 0.0505 | 0.0286 | 0.8073 | 0.1136 |
| 45 162 | 2 | 0.1527 | 0.7588 | 0.0303 | 0.0582 |
| 46 166 | 4 | 0.0451 | 0.0376 | 0.1922 | 0.7251 |
| 47 167 | 4 | 0.0435 | 0.0394 | 0.2353 | 0.6818 |
| 48 169 | 1 | 0.9227 | 0.0311 | 0.0271 | 0.0191 |
| 49 170 | 4 | 0.0707 | 0.1135 | 0.1257 | 0.6901 |

**Cluster Medoids Section**

| Variable | Cluster1 | Cluster2 | Cluster3 | Cluster4 | Cluster5 |
|---|---|---|---|---|---|
| Factor1 | 0.6248 | 6.8201 | -0.5879 | -0.8821 | 0.3822 |
| Factor2 | -0.0306 | -0.0255 | 1.6774 | -1.1021 | 1.1491 |
| Factor3 | 1.2831 | -1.5344 | 0.6984 | -0.287 | -0.84 |
| Row | 48 169 | 11 30 | 30 94 | 8 24 | 18 53 |

**Membership Summary Section for Clusters = 5**

<table>
<tr><th>Row</th><th>Cluster</th><th>Cluster Membership</th><th>Sum of Squared Memberships</th><th>Bar of Squared Memberships</th><th>Silhouette Amount</th><th>Silhouette Bar</th></tr>
<tr><td>48 169</td><td>1</td><td>0.9311</td><td>0.8684</td><td>|IIIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.5687</td><td>|IIIIIIIIIIIIIIIII</td></tr>
<tr><td>12 33</td><td>1</td><td>0.9263</td><td>0.8601</td><td>|IIIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.4939</td><td>|IIIIIIIIIIIIIII</td></tr>
<tr><td>27 79</td><td>1</td><td>0.9185</td><td>0.8461</td><td>|IIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.4606</td><td>|IIIIIIIIIIIIII</td></tr>
<tr><td>42 145</td><td>1</td><td>0.9091</td><td>0.8290</td><td>|IIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.5849</td><td>|IIIIIIIIIIIIIIIIII</td></tr>
<tr><td>28 81</td><td>1</td><td>0.8793</td><td>0.7798</td><td>|IIIIIIIIIIIIIIIIIIIIIII</td><td>0.4100</td><td>|IIIIIIIIIIII</td></tr>
<tr><td>9 25</td><td>1</td><td>0.8402</td><td>0.7150</td><td>|IIIIIIIIIIIIIIIIIIIII</td><td>0.4255</td><td>|IIIIIIIIIIIII</td></tr>
<tr><td>1 5</td><td>1</td><td>0.8213</td><td>0.6842</td><td>|IIIIIIIIIIIIIIIIIIIII</td><td>0.4667</td><td>|IIIIIIIIIIIIII</td></tr>
<tr><td>14 45</td><td>1</td><td>0.7910</td><td>0.6391</td><td>|IIIIIIIIIIIIIIIIIII</td><td>0.5265</td><td>|IIIIIIIIIIIIIIII</td></tr>
<tr><td>5 17</td><td>1</td><td>0.7854</td><td>0.6373</td><td>|IIIIIIIIIIIIIIIIIII</td><td>0.3572</td><td>|IIIIIIIIIII</td></tr>
<tr><td>37 112</td><td>1</td><td>0.7842</td><td>0.6302</td><td>|IIIIIIIIIIIIIIIIIII</td><td>0.4792</td><td>|IIIIIIIIIIIIII</td></tr>
<tr><td>2 8</td><td>1</td><td>0.6016</td><td>0.4600</td><td>|IIIIIIIIIIIIII</td><td>0.0985</td><td>|III</td></tr>
<tr><td>10 28</td><td>1</td><td>0.4796</td><td>0.3081</td><td>|IIIIIIIII</td><td>0.2164</td><td>|IIIIII</td></tr>
<tr><td>33 106</td><td>1</td><td>0.3723</td><td>0.2666</td><td>|IIIIIIII</td><td>0.0836</td><td>|III</td></tr>
<tr><td>11 30</td><td>2</td><td>0.9458</td><td>0.8953</td><td>|IIIIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.4432</td><td>|IIIIIIIIIIIII</td></tr>
<tr><td>22 66</td><td>2</td><td>0.8798</td><td>0.7779</td><td>|IIIIIIIIIIIIIIIIIIIIIII</td><td>0.3554</td><td>|IIIIIIIIIII</td></tr>
<tr><td>43 157</td><td>2</td><td>0.7562</td><td>0.5870</td><td>|IIIIIIIIIIIIIIIIII</td><td>0.4230</td><td>|IIIIIIIIIIIII</td></tr>
<tr><td>30 94</td><td>3</td><td>0.9470</td><td>0.8979</td><td>|IIIIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.3826</td><td>|IIIIIIIIIII</td></tr>
<tr><td>34 108</td><td>3</td><td>0.9229</td><td>0.8540</td><td>|IIIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.4402</td><td>|IIIIIIIIIIIII</td></tr>
<tr><td>39 119</td><td>3</td><td>0.8905</td><td>0.7974</td><td>|IIIIIIIIIIIIIIIIIIIIIIII</td><td>0.3574</td><td>|IIIIIIIIIII</td></tr>
<tr><td>7 23</td><td>3</td><td>0.8758</td><td>0.7748</td><td>|IIIIIIIIIIIIIIIIIIIIIII</td><td>0.2228</td><td>|IIIIIII</td></tr>
<tr><td>44 160</td><td>3</td><td>0.8061</td><td>0.6668</td><td>|IIIIIIIIIIIIIIIIIIII</td><td>0.1349</td><td>|IIII</td></tr>
<tr><td>4 16</td><td>3</td><td>0.7401</td><td>0.5879</td><td>|IIIIIIIIIIIIIIIIII</td><td>-0.0219</td><td>|</td></tr>
<tr><td>23 69</td><td>3</td><td>0.6272</td><td>0.4413</td><td>|IIIIIIIIIIIII</td><td>0.2786</td><td>|IIIIIIII</td></tr>
<tr><td>15 48</td><td>3</td><td>0.4906</td><td>0.3170</td><td>|IIIIIIIIII</td><td>0.2650</td><td>|IIIIIIII</td></tr>
<tr><td>26 78</td><td>3</td><td>0.3421</td><td>0.2499</td><td>|IIIIIII</td><td>-0.0127</td><td>|</td></tr>
<tr><td>8 24</td><td>4</td><td>0.9120</td><td>0.8347</td><td>|IIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.5014</td><td>|IIIIIIIIIIIIIII</td></tr>
<tr><td>6 18</td><td>4</td><td>0.9019</td><td>0.8167</td><td>|IIIIIIIIIIIIIIIIIIIIIIII</td><td>0.5725</td><td>|IIIIIIIIIIIIIIIII</td></tr>
<tr><td>3 9</td><td>4</td><td>0.8985</td><td>0.8112</td><td>|IIIIIIIIIIIIIIIIIIIIIIII</td><td>0.5062</td><td>|IIIIIIIIIIIIIII</td></tr>
<tr><td>21 62</td><td>4</td><td>0.8905</td><td>0.7982</td><td>|IIIIIIIIIIIIIIIIIIIIIIII</td><td>0.4412</td><td>|IIIIIIIIIIIII</td></tr>
<tr><td>32 100</td><td>4</td><td>0.8394</td><td>0.7124</td><td>|IIIIIIIIIIIIIIIIIIIII</td><td>0.5663</td><td>|IIIIIIIIIIIIIIIII</td></tr>
<tr><td>17 51</td><td>4</td><td>0.8293</td><td>0.6968</td><td>|IIIIIIIIIIIIIIIIIIIII</td><td>0.5300</td><td>|IIIIIIIIIIIIIIII</td></tr>
<tr><td>41 137</td><td>4</td><td>0.8215</td><td>0.6881</td><td>|IIIIIIIIIIIIIIIIIIIII</td><td>0.4305</td><td>|IIIIIIIIIIIII</td></tr>
<tr><td>38 116</td><td>4</td><td>0.7698</td><td>0.6194</td><td>|IIIIIIIIIIIIIIIIIII</td><td>0.3059</td><td>|IIIIIIIII</td></tr>
<tr><td>45 162</td><td>4</td><td>0.7596</td><td>0.6020</td><td>|IIIIIIIIIIIIIIIIII</td><td>0.3765</td><td>|IIIIIIIIIII</td></tr>
<tr><td>13 44</td><td>4</td><td>0.7431</td><td>0.5712</td><td>|IIIIIIIIIIIIIIIII</td><td>0.5115</td><td>|IIIIIIIIIIIIIII</td></tr>
<tr><td>36 111</td><td>4</td><td>0.6324</td><td>0.4397</td><td>|IIIIIIIIIIIII</td><td>0.4274</td><td>|IIIIIIIIIIIII</td></tr>
<tr><td>31 96</td><td>4</td><td>0.5921</td><td>0.4526</td><td>|IIIIIIIIIIIIII</td><td>0.0990</td><td>|III</td></tr>
<tr><td>40 123</td><td>4</td><td>0.5407</td><td>0.3813</td><td>|IIIIIIIIIII</td><td>0.2032</td><td>|IIIIII</td></tr>
<tr><td>20 59</td><td>4</td><td>0.3181</td><td>0.2283</td><td>|IIIIIII</td><td>0.1741</td><td>|IIIII</td></tr>
<tr><td>18 53</td><td>5</td><td>0.8800</td><td>0.7800</td><td>|IIIIIIIIIIIIIIIIIIIIIII</td><td>0.5203</td><td>|IIIIIIIIIIIIIIII</td></tr>
<tr><td>25 76</td><td>5</td><td>0.8609</td><td>0.7475</td><td>|IIIIIIIIIIIIIIIIIIIIII</td><td>0.5383</td><td>|IIIIIIIIIIIIIIII</td></tr>
<tr><td>35 109</td><td>5</td><td>0.8080</td><td>0.6694</td><td>|IIIIIIIIIIIIIIIIIIII</td><td>0.4635</td><td>|IIIIIIIIIIIIII</td></tr>
</table>

**Membership Summary Section for Clusters = 5**

| Row | Cluster | Cluster Membership | Sum of Squared Memberships | Bar of Squared Memberships | Silhouette Amount | Silhouette Bar |
|---|---|---|---|---|---|---|
| 49 170 | 5 | 0.8077 | 0.6639 | |IIIIIIIIIIIIIIIIIIII | 0.4738 | |IIIIIIIIIIIIII |
| 47 167 | 5 | 0.7867 | 0.6429 | |IIIIIIIIIIIIIIIIIII | 0.4054 | |IIIIIIIIIIII |
| 19 57 | 5 | 0.7490 | 0.5813 | |IIIIIIIIIIIIIIIII | 0.5068 | |IIIIIIIIIIIIIII |
| 24 70 | 5 | 0.7255 | 0.5504 | |IIIIIIIIIIIIIIIII | 0.3816 | |IIIIIIIIIII |
| 46 166 | 5 | 0.6926 | 0.5223 | |IIIIIIIIIIIIIIII | 0.3710 | |IIIIIIIIIII |
| 16 50 | 5 | 0.6903 | 0.5069 | |IIIIIIIIIIIIIII | 0.3599 | |IIIIIIIIIII |
| 29 88 | 5 | 0.4455 | 0.2817 | |IIIIIIII | 0.3731 | |IIIIIIIIIII |

**Membership Matrix Section**

| Row | Cluster | Prob in 1 | Prob in 2 | Prob in 3 | Prob in 4 | Prob in 5 |
|---|---|---|---|---|---|---|
| 1 5 | 1 | 0.8213 | 0.0102 | 0.0562 | 0.0657 | 0.0467 |
| 2 8 | 1 | 0.6016 | 0.0097 | 0.0371 | 0.3078 | 0.0438 |
| 3 9 | 4 | 0.0537 | 0.0068 | 0.0148 | 0.8985 | 0.0262 |
| 4 16 | 3 | 0.0351 | 0.0073 | 0.7401 | 0.0213 | 0.1962 |
| 5 17 | 1 | 0.7854 | 0.0082 | 0.0379 | 0.1330 | 0.0355 |
| 6 18 | 4 | 0.0458 | 0.0099 | 0.0139 | 0.9019 | 0.0284 |
| 7 23 | 3 | 0.0215 | 0.0054 | 0.8758 | 0.0129 | 0.0844 |
| 8 24 | 4 | 0.0484 | 0.0052 | 0.0123 | 0.9120 | 0.0221 |
| 9 25 | 1 | 0.8402 | 0.0107 | 0.0343 | 0.0817 | 0.0331 |
| 10 28 | 1 | 0.4796 | 0.0447 | 0.1384 | 0.1723 | 0.1650 |
| 11 30 | 2 | 0.0128 | 0.9458 | 0.0110 | 0.0143 | 0.0161 |
| 12 33 | 1 | 0.9263 | 0.0030 | 0.0168 | 0.0395 | 0.0144 |
| 13 44 | 4 | 0.0844 | 0.0378 | 0.0408 | 0.7431 | 0.0939 |
| 14 45 | 1 | 0.7910 | 0.0151 | 0.0844 | 0.0617 | 0.0478 |
| 15 48 | 3 | 0.1970 | 0.0589 | 0.4906 | 0.0960 | 0.1575 |
| 16 50 | 5 | 0.0682 | 0.0188 | 0.0947 | 0.1279 | 0.6903 |
| 17 51 | 4 | 0.0698 | 0.0166 | 0.0283 | 0.8293 | 0.0560 |
| 18 53 | 5 | 0.0226 | 0.0071 | 0.0679 | 0.0224 | 0.8800 |
| 19 57 | 5 | 0.0460 | 0.0348 | 0.1208 | 0.0494 | 0.7490 |
| 20 59 | 4 | 0.1554 | 0.2163 | 0.0918 | 0.3181 | 0.2184 |
| 21 62 | 4 | 0.0668 | 0.0050 | 0.0136 | 0.8905 | 0.0240 |
| 22 66 | 2 | 0.0282 | 0.8798 | 0.0212 | 0.0385 | 0.0322 |
| 23 69 | 3 | 0.0899 | 0.0428 | 0.6272 | 0.0524 | 0.1878 |
| 24 70 | 5 | 0.0576 | 0.0205 | 0.0759 | 0.1205 | 0.7255 |
| 25 76 | 5 | 0.0292 | 0.0084 | 0.0599 | 0.0416 | 0.8609 |
| 26 78 | 3 | 0.2953 | 0.0938 | 0.3421 | 0.1155 | 0.1534 |
| 27 79 | 1 | 0.9185 | 0.0032 | 0.0177 | 0.0442 | 0.0164 |
| 28 81 | 1 | 0.8793 | 0.0054 | 0.0193 | 0.0770 | 0.0190 |
| 29 88 | 5 | 0.0943 | 0.1997 | 0.1467 | 0.1138 | 0.4455 |
| 30 94 | 3 | 0.0148 | 0.0024 | 0.9470 | 0.0071 | 0.0287 |
| 31 96 | 4 | 0.3137 | 0.0110 | 0.0356 | 0.5921 | 0.0476 |
| 32 100 | 4 | 0.0596 | 0.0178 | 0.0258 | 0.8394 | 0.0573 |

**Membership Matrix Section**

| Row | Cluster | Prob in 1 | Prob in 2 | Prob in 3 | Prob in 4 | Prob in 5 |
|---|---|---|---|---|---|---|
| 33 106 | 1 | 0.3723 | 0.0624 | 0.2966 | 0.1345 | 0.1342 |
| 34 108 | 3 | 0.0232 | 0.0045 | 0.9229 | 0.0106 | 0.0388 |
| 35 109 | 5 | 0.0303 | 0.0131 | 0.1216 | 0.0271 | 0.8080 |
| 36 111 | 4 | 0.1479 | 0.0614 | 0.0514 | 0.6324 | 0.1068 |
| 37 112 | 1 | 0.7842 | 0.0117 | 0.0646 | 0.0950 | 0.0445 |
| 38 116 | 4 | 0.1561 | 0.0076 | 0.0243 | 0.7698 | 0.0422 |
| 39 119 | 3 | 0.0362 | 0.0047 | 0.8905 | 0.0163 | 0.0522 |
| 40 123 | 4 | 0.2684 | 0.0191 | 0.0563 | 0.5407 | 0.1155 |
| 41 137 | 4 | 0.1042 | 0.0099 | 0.0213 | 0.8215 | 0.0431 |
| 42 145 | 1 | 0.9091 | 0.0054 | 0.0307 | 0.0350 | 0.0198 |
| 43 157 | 2 | 0.0531 | 0.7562 | 0.0608 | 0.0544 | 0.0755 |
| 44 160 | 3 | 0.0431 | 0.0063 | 0.8061 | 0.0243 | 0.1201 |
| 45 162 | 4 | 0.1452 | 0.0128 | 0.0278 | 0.7596 | 0.0546 |
| 46 166 | 5 | 0.0492 | 0.0232 | 0.1949 | 0.0402 | 0.6926 |
| 47 167 | 5 | 0.0293 | 0.0078 | 0.1499 | 0.0263 | 0.7867 |
| 48 169 | 1 | 0.9311 | 0.0038 | 0.0222 | 0.0270 | 0.0159 |
| 49 170 | 5 | 0.0421 | 0.0115 | 0.0711 | 0.0677 | 0.8077 |

**Cluster Medoids Section**

| Variable | Cluster1 | Cluster2 | Cluster3 | Cluster4 | Cluster5 | Cluster6 |
|---|---|---|---|---|---|---|
| Factor1 | -0.6146 | 0.6248 | 6.8201 | -0.5068 | -0.5879 | 0.3822 |
| Factor2 | -1.3633 | -0.0306 | -0.0255 | -0.6832 | 1.6774 | 1.1491 |
| Factor3 | -1.3072 | 1.2831 | -1.5344 | 0.6975 | 0.6984 | -0.84 |
| Row | 32 100 | 48 169 | 11 30 | 2 8 | 30 94 | 18 53 |

**Membership Summary Section for Clusters = 6**

<table>
<tr><th>Row</th><th>Cluster</th><th>Cluster Membership</th><th>Sum of Squared Memberships</th><th>Bar of Squared Memberships</th><th>Silhouette Amount</th><th>Silhouette Bar</th></tr>
<tr><td>32 100</td><td>1</td><td>0.8843</td><td>0.7860</td><td>|IIIIIIIIIIIIIIIIIIIIIIII</td><td>0.4433</td><td>|IIIIIIIIIIIII</td></tr>
<tr><td>6 18</td><td>1</td><td>0.8672</td><td>0.7588</td><td>|IIIIIIIIIIIIIIIIIIIIIII</td><td>0.3160</td><td>|IIIIIIIII</td></tr>
<tr><td>17 51</td><td>1</td><td>0.8521</td><td>0.7331</td><td>|IIIIIIIIIIIIIIIIIIIIII</td><td>0.3801</td><td>|IIIIIIIIIII</td></tr>
<tr><td>3 9</td><td>1</td><td>0.8222</td><td>0.6905</td><td>|IIIIIIIIIIIIIIIIIIIII</td><td>0.1762</td><td>|IIIII</td></tr>
<tr><td>8 24</td><td>1</td><td>0.7874</td><td>0.6430</td><td>|IIIIIIIIIIIIIIIIIII</td><td>0.0830</td><td>|II</td></tr>
<tr><td>13 44</td><td>1</td><td>0.7786</td><td>0.6192</td><td>|IIIIIIIIIIIIIIIIIII</td><td>0.4301</td><td>|IIIIIIIIIIIII</td></tr>
<tr><td>21 62</td><td>1</td><td>0.5462</td><td>0.4276</td><td>|IIIIIIIIIIIII</td><td>-0.2199</td><td>|</td></tr>
<tr><td>36 111</td><td>1</td><td>0.4855</td><td>0.3112</td><td>|IIIIIIIII</td><td>0.1438</td><td>|IIII</td></tr>
<tr><td>20 59</td><td>1</td><td>0.2561</td><td>0.1844</td><td>|IIIIII</td><td>0.0898</td><td>|III</td></tr>
<tr><td>48 169</td><td>2</td><td>0.8990</td><td>0.8133</td><td>|IIIIIIIIIIIIIIIIIIIIIIII</td><td>-0.0786</td><td>|</td></tr>
<tr><td>42 145</td><td>2</td><td>0.8320</td><td>0.7058</td><td>|IIIIIIIIIIIIIIIIIIIII</td><td>-0.0019</td><td>|</td></tr>
<tr><td>14 45</td><td>2</td><td>0.8175</td><td>0.6796</td><td>|IIIIIIIIIIIIIIIIIIII</td><td>0.2389</td><td>|IIIIIII</td></tr>
<tr><td>1 5</td><td>2</td><td>0.7881</td><td>0.6401</td><td>|IIIIIIIIIIIIIIIIIII</td><td>-0.1071</td><td>|</td></tr>
<tr><td>9 25</td><td>2</td><td>0.6971</td><td>0.5341</td><td>|IIIIIIIIIIIIIIII</td><td>-0.2281</td><td>|</td></tr>
<tr><td>37 112</td><td>2</td><td>0.4741</td><td>0.3627</td><td>|IIIIIIIIIII</td><td>-0.2331</td><td>|</td></tr>
<tr><td>10 28</td><td>2</td><td>0.4546</td><td>0.2890</td><td>|IIIIIIIII</td><td>-0.1348</td><td>|</td></tr>
<tr><td>33 106</td><td>2</td><td>0.3527</td><td>0.2277</td><td>|IIIIIII</td><td>0.1924</td><td>|IIIIII</td></tr>
<tr><td>26 78</td><td>2</td><td>0.3192</td><td>0.2147</td><td>|IIIIII</td><td>0.1097</td><td>|III</td></tr>
<tr><td>11 30</td><td>3</td><td>0.9388</td><td>0.8821</td><td>|IIIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.4432</td><td>|IIIIIIIIIIIII</td></tr>
<tr><td>22 66</td><td>3</td><td>0.8605</td><td>0.7444</td><td>|IIIIIIIIIIIIIIIIIIIIII</td><td>0.3419</td><td>|IIIIIIIIII</td></tr>
<tr><td>43 157</td><td>3</td><td>0.7143</td><td>0.5268</td><td>|IIIIIIIIIIIIIIII</td><td>0.4230</td><td>|IIIIIIIIIIIII</td></tr>
<tr><td>2 8</td><td>4</td><td>0.8463</td><td>0.7251</td><td>|IIIIIIIIIIIIIIIIIIIIII</td><td>0.5735</td><td>|IIIIIIIIIIIIIIIII</td></tr>
<tr><td>31 96</td><td>4</td><td>0.7411</td><td>0.5761</td><td>|IIIIIIIIIIIIIIIII</td><td>0.4256</td><td>|IIIIIIIIIIIII</td></tr>
<tr><td>5 17</td><td>4</td><td>0.6903</td><td>0.5227</td><td>|IIIIIIIIIIIIIIII</td><td>0.4642</td><td>|IIIIIIIIIIIIII</td></tr>
<tr><td>38 116</td><td>4</td><td>0.6619</td><td>0.4923</td><td>|IIIIIIIIIIIIIII</td><td>0.3778</td><td>|IIIIIIIIIII</td></tr>
<tr><td>28 81</td><td>4</td><td>0.5654</td><td>0.4459</td><td>|IIIIIIIIIIIII</td><td>0.4220</td><td>|IIIIIIIIIIIII</td></tr>
<tr><td>40 123</td><td>4</td><td>0.5076</td><td>0.3322</td><td>|IIIIIIIIII</td><td>0.3507</td><td>|IIIIIIIIIII</td></tr>
<tr><td>12 33</td><td>4</td><td>0.5065</td><td>0.4342</td><td>|IIIIIIIIIIIII</td><td>0.3917</td><td>|IIIIIIIIIIII</td></tr>
<tr><td>27 79</td><td>4</td><td>0.4862</td><td>0.4323</td><td>|IIIIIIIIIIIII</td><td>0.4114</td><td>|IIIIIIIIIIII</td></tr>
<tr><td>45 162</td><td>4</td><td>0.4832</td><td>0.3531</td><td>|IIIIIIIIIII</td><td>0.2615</td><td>|IIIIIIII</td></tr>
<tr><td>41 137</td><td>4</td><td>0.4337</td><td>0.3584</td><td>|IIIIIIIIIII</td><td>0.2027</td><td>|IIIIII</td></tr>
<tr><td>30 94</td><td>5</td><td>0.9491</td><td>0.9016</td><td>|IIIIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.5109</td><td>|IIIIIIIIIIIIIII</td></tr>
<tr><td>34 108</td><td>5</td><td>0.9090</td><td>0.8286</td><td>|IIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.5343</td><td>|IIIIIIIIIIIIIIII</td></tr>
<tr><td>39 119</td><td>5</td><td>0.8793</td><td>0.7773</td><td>|IIIIIIIIIIIIIIIIIIIIIII</td><td>0.4731</td><td>|IIIIIIIIIIIIII</td></tr>
<tr><td>7 23</td><td>5</td><td>0.8790</td><td>0.7785</td><td>|IIIIIIIIIIIIIIIIIIIIIII</td><td>0.3778</td><td>|IIIIIIIIIII</td></tr>
<tr><td>44 160</td><td>5</td><td>0.8053</td><td>0.6615</td><td>|IIIIIIIIIIIIIIIIIIII</td><td>0.2957</td><td>|IIIIIIIII</td></tr>
<tr><td>4 16</td><td>5</td><td>0.7404</td><td>0.5812</td><td>|IIIIIIIIIIIIIIIII</td><td>0.1570</td><td>|IIIII</td></tr>
<tr><td>23 69</td><td>5</td><td>0.5608</td><td>0.3668</td><td>|IIIIIIIIIII</td><td>0.3222</td><td>|IIIIIIIIII</td></tr>
<tr><td>15 48</td><td>5</td><td>0.3950</td><td>0.2441</td><td>|IIIIIII</td><td>0.1761</td><td>|IIIII</td></tr>
<tr><td>18 53</td><td>6</td><td>0.8738</td><td>0.7684</td><td>|IIIIIIIIIIIIIIIIIIIIIII</td><td>0.4646</td><td>|IIIIIIIIIIIIII</td></tr>
<tr><td>25 76</td><td>6</td><td>0.8249</td><td>0.6881</td><td>|IIIIIIIIIIIIIIIIIIIII</td><td>0.5224</td><td>|IIIIIIIIIIIIIIII</td></tr>
<tr><td>35 109</td><td>6</td><td>0.8089</td><td>0.6674</td><td>|IIIIIIIIIIIIIIIIIIII</td><td>0.4018</td><td>|IIIIIIIIIIII</td></tr>
</table>

**Membership Summary Section for Clusters = 6**

<table>
<tr><th>Row</th><th>Cluster</th><th>Cluster Membership</th><th>Sum of Squared Memberships</th><th>Bar of Squared Memberships</th><th>Silhouette Amount</th><th>Silhouette Bar</th></tr>
<tr><td>47 167</td><td>6</td><td>0.7744</td><td>0.6219</td><td>|IIIIIIIIIIIIIIIIIII</td><td>0.3125</td><td>|IIIIIIIII</td></tr>
<tr><td>49 170</td><td>6</td><td>0.7516</td><td>0.5797</td><td>|IIIIIIIIIIIIIIIII</td><td>0.4708</td><td>|IIIIIIIIIIIIII</td></tr>
<tr><td>19 57</td><td>6</td><td>0.7330</td><td>0.5553</td><td>|IIIIIIIIIIIIIIIII</td><td>0.4662</td><td>|IIIIIIIIIIIIII</td></tr>
<tr><td>46 166</td><td>6</td><td>0.6851</td><td>0.5044</td><td>|IIIIIIIIIIIIIII</td><td>0.3066</td><td>|IIIIIIIII</td></tr>
<tr><td>24 70</td><td>6</td><td>0.6530</td><td>0.4556</td><td>|IIIIIIIIIIIIII</td><td>0.3985</td><td>|IIIIIIIIIIII</td></tr>
<tr><td>16 50</td><td>6</td><td>0.6119</td><td>0.4108</td><td>|IIIIIIIIIIII</td><td>0.3782</td><td>|IIIIIIIIIII</td></tr>
<tr><td>29 88</td><td>6</td><td>0.4115</td><td>0.2428</td><td>|IIIIIII</td><td>0.3770</td><td>|IIIIIIIIIII</td></tr>
</table>

**Membership Matrix Section**

| Row | Cluster | Prob in 1 | Prob in 2 | Prob in 3 | Prob in 4 | Prob in 5 | Prob in 6 |
|---|---|---|---|---|---|---|---|
| 1 5 | 2 | 0.0243 | 0.7881 | 0.0052 | 0.1304 | 0.0281 | 0.0239 |
| 2 8 | 4 | 0.0510 | 0.0775 | 0.0027 | 0.8463 | 0.0104 | 0.0120 |
| 3 9 | 1 | 0.8222 | 0.0290 | 0.0048 | 0.1152 | 0.0107 | 0.0182 |
| 4 16 | 5 | 0.0156 | 0.0345 | 0.0060 | 0.0282 | 0.7404 | 0.1752 |
| 5 17 | 4 | 0.0558 | 0.2051 | 0.0049 | 0.6903 | 0.0227 | 0.0212 |
| 6 18 | 1 | 0.8672 | 0.0243 | 0.0062 | 0.0759 | 0.0089 | 0.0176 |
| 7 23 | 5 | 0.0092 | 0.0203 | 0.0042 | 0.0159 | 0.8790 | 0.0714 |
| 8 24 | 1 | 0.7874 | 0.0316 | 0.0045 | 0.1467 | 0.0109 | 0.0189 |
| 9 25 | 2 | 0.0383 | 0.6971 | 0.0070 | 0.2137 | 0.0221 | 0.0218 |
| 10 28 | 2 | 0.0862 | 0.4546 | 0.0288 | 0.2334 | 0.0887 | 0.1082 |
| 11 30 | 3 | 0.0124 | 0.0126 | 0.9388 | 0.0122 | 0.0097 | 0.0144 |
| 12 33 | 4 | 0.0328 | 0.4194 | 0.0037 | 0.5065 | 0.0202 | 0.0175 |
| 13 44 | 1 | 0.7786 | 0.0407 | 0.0200 | 0.0892 | 0.0222 | 0.0493 |
| 14 45 | 2 | 0.0225 | 0.8175 | 0.0069 | 0.0939 | 0.0371 | 0.0221 |
| 15 48 | 5 | 0.0763 | 0.2072 | 0.0503 | 0.1327 | 0.3950 | 0.1385 |
| 16 50 | 6 | 0.1178 | 0.0609 | 0.0172 | 0.0998 | 0.0925 | 0.6119 |
| 17 51 | 1 | 0.8521 | 0.0274 | 0.0077 | 0.0736 | 0.0135 | 0.0257 |
| 18 53 | 6 | 0.0167 | 0.0210 | 0.0058 | 0.0229 | 0.0598 | 0.8738 |
| 19 57 | 6 | 0.0402 | 0.0446 | 0.0291 | 0.0459 | 0.1072 | 0.7330 |
| 20 59 | 1 | 0.2561 | 0.1355 | 0.1708 | 0.1832 | 0.0757 | 0.1787 |
| 21 62 | 1 | 0.5462 | 0.0524 | 0.0055 | 0.3544 | 0.0154 | 0.0261 |
| 22 66 | 3 | 0.0356 | 0.0268 | 0.8605 | 0.0292 | 0.0189 | 0.0290 |
| 23 69 | 5 | 0.0443 | 0.1031 | 0.0388 | 0.0711 | 0.5608 | 0.1819 |
| 24 70 | 6 | 0.1148 | 0.0529 | 0.0189 | 0.0859 | 0.0745 | 0.6530 |
| 25 76 | 6 | 0.0377 | 0.0284 | 0.0079 | 0.0400 | 0.0611 | 0.8249 |
| 26 78 | 2 | 0.0815 | 0.3192 | 0.0727 | 0.1566 | 0.2479 | 0.1222 |
| 27 79 | 4 | 0.0322 | 0.4406 | 0.0036 | 0.4862 | 0.0194 | 0.0180 |
| 28 81 | 4 | 0.0451 | 0.3515 | 0.0047 | 0.5654 | 0.0167 | 0.0166 |
| 29 88 | 6 | 0.0981 | 0.0931 | 0.1691 | 0.0971 | 0.1310 | 0.4115 |
| 30 94 | 5 | 0.0046 | 0.0130 | 0.0017 | 0.0094 | 0.9491 | 0.0221 |
| 31 96 | 4 | 0.1432 | 0.0765 | 0.0046 | 0.7411 | 0.0150 | 0.0196 |
| 32 100 | 1 | 0.8843 | 0.0210 | 0.0072 | 0.0541 | 0.0107 | 0.0228 |

**Membership Matrix Section**

| Row | Cluster | Prob in 1 | Prob in 2 | Prob in 3 | Prob in 4 | Prob in 5 | Prob in 6 |
|---|---|---|---|---|---|---|---|
| 33 106 | 2 | 0.0926 | 0.3527 | 0.0474 | 0.1914 | 0.2125 | 0.1035 |
| 34 108 | 5 | 0.0084 | 0.0258 | 0.0040 | 0.0167 | 0.9090 | 0.0361 |
| 35 109 | 6 | 0.0202 | 0.0284 | 0.0105 | 0.0275 | 0.1044 | 0.8089 |
| 36 111 | 1 | 0.4855 | 0.1139 | 0.0482 | 0.2267 | 0.0414 | 0.0843 |
| 37 112 | 2 | 0.0637 | 0.4741 | 0.0100 | 0.3597 | 0.0544 | 0.0381 |
| 38 116 | 4 | 0.2195 | 0.0700 | 0.0050 | 0.6619 | 0.0163 | 0.0273 |
| 39 119 | 5 | 0.0118 | 0.0349 | 0.0039 | 0.0254 | 0.8793 | 0.0446 |
| 40 123 | 4 | 0.2025 | 0.1610 | 0.0129 | 0.5076 | 0.0388 | 0.0772 |
| 41 137 | 4 | 0.3997 | 0.0894 | 0.0103 | 0.4337 | 0.0226 | 0.0443 |
| 42 145 | 2 | 0.0182 | 0.8320 | 0.0037 | 0.1121 | 0.0204 | 0.0136 |
| 43 157 | 3 | 0.0510 | 0.0544 | 0.7143 | 0.0514 | 0.0569 | 0.0721 |
| 44 160 | 5 | 0.0171 | 0.0388 | 0.0050 | 0.0336 | 0.8053 | 0.1002 |
| 45 162 | 4 | 0.3238 | 0.1084 | 0.0114 | 0.4832 | 0.0252 | 0.0481 |
| 46 166 | 6 | 0.0309 | 0.0493 | 0.0193 | 0.0442 | 0.1713 | 0.6851 |
| 47 167 | 6 | 0.0204 | 0.0276 | 0.0066 | 0.0296 | 0.1414 | 0.7744 |
| 48 169 | 2 | 0.0101 | 0.8990 | 0.0020 | 0.0695 | 0.0111 | 0.0082 |
| 49 170 | 6 | 0.0627 | 0.0402 | 0.0110 | 0.0617 | 0.0728 | 0.7516 |

**Cluster Medoids Section**

| Variable | Cluster1 | Cluster2 | Cluster3 | Cluster4 | Cluster5 | Cluster6 |
|---|---|---|---|---|---|---|
| Factor1 | 6.8201 | -0.1699 | -0.6146 | 0.6248 | -0.5879 | 0.6786 |
| Factor2 | -0.0255 | -0.2872 | -1.3633 | -0.0306 | 1.6774 | -0.6386 |
| Factor3 | -1.5344 | 1.1 | -1.3072 | 1.2831 | 0.6984 | -0.2163 |
| Row | 11 30 | 12 33 | 32 100 | 48 169 | 30 94 | 45 162 |

**Cluster Medoids Section**

| Variable | Cluster7 |
|---|---|
| Factor1 | 0.3822 |
| Factor2 | 1.1491 |
| Factor3 | -0.84 |
| Row | 18 53 |

**Membership Summary Section for Clusters = 7**

<table>
<tr><th>Row</th><th>Cluster</th><th>Cluster Membership</th><th>Sum of Squared Memberships</th><th>Bar of Squared Memberships</th><th>Silhouette Amount</th><th>Silhouette Bar</th></tr>
<tr><td>11 30</td><td>1</td><td>0.9331</td><td>0.8715</td><td>|IIIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.3557</td><td>|IIIIIIIIIII</td></tr>
<tr><td>22 66</td><td>1</td><td>0.8443</td><td>0.7171</td><td>|IIIIIIIIIIIIIIIIIIIIII</td><td>0.2804</td><td>|IIIIIIII</td></tr>
<tr><td>43 157</td><td>1</td><td>0.6680</td><td>0.4651</td><td>|IIIIIIIIIIIIII</td><td>0.4230</td><td>|IIIIIIIIIIIII</td></tr>
<tr><td>12 33</td><td>2</td><td>0.8697</td><td>0.7642</td><td>|IIIIIIIIIIIIIIIIIIIIIII</td><td>0.6200</td><td>|IIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>5 17</td><td>2</td><td>0.8564</td><td>0.7394</td><td>|IIIIIIIIIIIIIIIIIIIIII</td><td>0.6852</td><td>|IIIIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>27 79</td><td>2</td><td>0.7710</td><td>0.6184</td><td>|IIIIIIIIIIIIIIIIIII</td><td>0.5550</td><td>|IIIIIIIIIIIIIIIII</td></tr>
<tr><td>28 81</td><td>2</td><td>0.7544</td><td>0.5930</td><td>|IIIIIIIIIIIIIIIIII</td><td>0.5716</td><td>|IIIIIIIIIIIIIIIII</td></tr>
<tr><td>2 8</td><td>2</td><td>0.7542</td><td>0.5863</td><td>|IIIIIIIIIIIIIIIIII</td><td>0.5775</td><td>|IIIIIIIIIIIIIIIII</td></tr>
<tr><td>37 112</td><td>2</td><td>0.5970</td><td>0.4191</td><td>|IIIIIIIIIIIII</td><td>0.4599</td><td>|IIIIIIIIIIIIII</td></tr>
<tr><td>31 96</td><td>2</td><td>0.4630</td><td>0.3051</td><td>|IIIIIIIII</td><td>0.3068</td><td>|IIIIIIIII</td></tr>
<tr><td>32 100</td><td>3</td><td>0.8856</td><td>0.7885</td><td>|IIIIIIIIIIIIIIIIIIIIIIII</td><td>0.5221</td><td>|IIIIIIIIIIIIIIII</td></tr>
<tr><td>17 51</td><td>3</td><td>0.8791</td><td>0.7771</td><td>|IIIIIIIIIIIIIIIIIIIIIII</td><td>0.5596</td><td>|IIIIIIIIIIIIIIIII</td></tr>
<tr><td>3 9</td><td>3</td><td>0.8217</td><td>0.6860</td><td>|IIIIIIIIIIIIIIIIIIIII</td><td>0.5101</td><td>|IIIIIIIIIIIIIII</td></tr>
<tr><td>8 24</td><td>3</td><td>0.7603</td><td>0.5994</td><td>|IIIIIIIIIIIIIIIIII</td><td>0.4558</td><td>|IIIIIIIIIIIIII</td></tr>
<tr><td>13 44</td><td>3</td><td>0.7229</td><td>0.5448</td><td>|IIIIIIIIIIIIIIII</td><td>0.3610</td><td>|IIIIIIIIIII</td></tr>
<tr><td>6 18</td><td>3</td><td>0.7034</td><td>0.5374</td><td>|IIIIIIIIIIIIIIII</td><td>0.2579</td><td>|IIIIIIII</td></tr>
<tr><td>21 62</td><td>3</td><td>0.4539</td><td>0.3344</td><td>|IIIIIIIIII</td><td>0.2052</td><td>|IIIIII</td></tr>
<tr><td>48 169</td><td>4</td><td>0.8203</td><td>0.6902</td><td>|IIIIIIIIIIIIIIIIIIIII</td><td>-0.2647</td><td>|</td></tr>
<tr><td>14 45</td><td>4</td><td>0.8174</td><td>0.6794</td><td>|IIIIIIIIIIIIIIIIIIII</td><td>0.0956</td><td>|III</td></tr>
<tr><td>1 5</td><td>4</td><td>0.7536</td><td>0.5883</td><td>|IIIIIIIIIIIIIIIIII</td><td>-0.1278</td><td>|</td></tr>
<tr><td>42 145</td><td>4</td><td>0.6620</td><td>0.5047</td><td>|IIIIIIIIIIIIIII</td><td>-0.3216</td><td>|</td></tr>
<tr><td>9 25</td><td>4</td><td>0.5984</td><td>0.4212</td><td>|IIIIIIIIIIIII</td><td>-0.2587</td><td>|</td></tr>
<tr><td>10 28</td><td>4</td><td>0.4026</td><td>0.2460</td><td>|IIIIIII</td><td>-0.1213</td><td>|</td></tr>
<tr><td>33 106</td><td>4</td><td>0.3251</td><td>0.2009</td><td>|IIIIII</td><td>0.1320</td><td>|IIII</td></tr>
<tr><td>26 78</td><td>4</td><td>0.3193</td><td>0.1934</td><td>|IIIIII</td><td>0.1365</td><td>|IIII</td></tr>
<tr><td>30 94</td><td>5</td><td>0.9502</td><td>0.9035</td><td>|IIIIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.5109</td><td>|IIIIIIIIIIIIIII</td></tr>
<tr><td>34 108</td><td>5</td><td>0.8967</td><td>0.8065</td><td>|IIIIIIIIIIIIIIIIIIIIIIII</td><td>0.5343</td><td>|IIIIIIIIIIIIIIII</td></tr>
<tr><td>39 119</td><td>5</td><td>0.8729</td><td>0.7657</td><td>|IIIIIIIIIIIIIIIIIIIIIII</td><td>0.4731</td><td>|IIIIIIIIIIIIII</td></tr>
<tr><td>7 23</td><td>5</td><td>0.8722</td><td>0.7664</td><td>|IIIIIIIIIIIIIIIIIIIIIII</td><td>0.3778</td><td>|IIIIIIIIIII</td></tr>
<tr><td>44 160</td><td>5</td><td>0.8018</td><td>0.6540</td><td>|IIIIIIIIIIIIIIIIIIII</td><td>0.2957</td><td>|IIIIIIIII</td></tr>
<tr><td>4 16</td><td>5</td><td>0.7223</td><td>0.5554</td><td>|IIIIIIIIIIIIIIIII</td><td>0.1570</td><td>|IIIII</td></tr>
<tr><td>23 69</td><td>5</td><td>0.5058</td><td>0.3117</td><td>|IIIIIIIII</td><td>0.3222</td><td>|IIIIIIIIII</td></tr>
<tr><td>15 48</td><td>5</td><td>0.3371</td><td>0.2033</td><td>|IIIIII</td><td>0.1671</td><td>|IIIII</td></tr>
<tr><td>45 162</td><td>6</td><td>0.9345</td><td>0.8744</td><td>|IIIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.4020</td><td>|IIIIIIIIIIII</td></tr>
<tr><td>41 137</td><td>6</td><td>0.9259</td><td>0.8589</td><td>|IIIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.3334</td><td>|IIIIIIIIII</td></tr>
<tr><td>40 123</td><td>6</td><td>0.8196</td><td>0.6793</td><td>|IIIIIIIIIIIIIIIIIIII</td><td>0.3213</td><td>|IIIIIIIIII</td></tr>
<tr><td>38 116</td><td>6</td><td>0.5894</td><td>0.4005</td><td>|IIIIIIIIIIII</td><td>-0.1228</td><td>|</td></tr>
<tr><td>36 111</td><td>6</td><td>0.4943</td><td>0.3159</td><td>|IIIIIIIII</td><td>0.2561</td><td>|IIIIIIII</td></tr>
<tr><td>20 59</td><td>6</td><td>0.3146</td><td>0.1839</td><td>|IIIIII</td><td>0.2889</td><td>|IIIIIIIII</td></tr>
<tr><td>18 53</td><td>7</td><td>0.8762</td><td>0.7715</td><td>|IIIIIIIIIIIIIIIIIIIIIII</td><td>0.4646</td><td>|IIIIIIIIIIIIII</td></tr>
<tr><td>35 109</td><td>7</td><td>0.8286</td><td>0.6950</td><td>|IIIIIIIIIIIIIIIIIIIII</td><td>0.4018</td><td>|IIIIIIIIIIII</td></tr>
<tr><td>47 167</td><td>7</td><td>0.7735</td><td>0.6171</td><td>|IIIIIIIIIIIIIIIIIII</td><td>0.3125</td><td>|IIIIIIIII</td></tr>
</table>

**Membership Summary Section for Clusters = 7**

| Row | Cluster | Cluster Membership | Sum of Squared Memberships | Bar of Squared Memberships | Silhouette Amount | Silhouette Bar |
|---|---|---|---|---|---|---|
| 25 76 | 7 | 0.7705 | 0.6046 | \|IIIIIIIIIIIIIIIIII | 0.5133 | \|IIIIIIIIIIIIIII |
| 19 57 | 7 | 0.7280 | 0.5453 | \|IIIIIIIIIIIIIIII | 0.4662 | \|IIIIIIIIIIIIII |
| 46 166 | 7 | 0.7010 | 0.5168 | \|IIIIIIIIIIIIIIII | 0.3066 | \|IIIIIIIII |
| 49 170 | 7 | 0.6758 | 0.4777 | \|IIIIIIIIIIIIII | 0.4595 | \|IIIIIIIIIIIIII |
| 24 70 | 7 | 0.5628 | 0.3559 | \|IIIIIIIIIII | 0.3730 | \|IIIIIIIIIII |
| 16 50 | 7 | 0.5230 | 0.3192 | \|IIIIIIIIII | 0.3494 | \|IIIIIIIIII |
| 29 88 | 7 | 0.3805 | 0.2131 | \|IIIIII | 0.2619 | \|IIIIIIII |

**Membership Matrix Section**

| Row | Cluster | Prob in 1 | Prob in 2 | Prob in 3 | Prob in 4 | Prob in 5 | Prob in 6 |
|---|---|---|---|---|---|---|---|
| 1 5 | 4 | 0.0042 | 0.1262 | 0.0163 | 0.7536 | 0.0225 | 0.0578 |
| 2 8 | 2 | 0.0031 | 0.7542 | 0.0496 | 0.0649 | 0.0119 | 0.1028 |
| 3 9 | 3 | 0.0035 | 0.0440 | 0.8217 | 0.0187 | 0.0080 | 0.0913 |
| 4 16 | 5 | 0.0055 | 0.0244 | 0.0130 | 0.0336 | 0.7223 | 0.0246 |
| 5 17 | 2 | 0.0021 | 0.8564 | 0.0215 | 0.0624 | 0.0099 | 0.0387 |
| 6 18 | 3 | 0.0065 | 0.0394 | 0.7034 | 0.0231 | 0.0095 | 0.2001 |
| 7 23 | 5 | 0.0037 | 0.0142 | 0.0077 | 0.0196 | 0.8722 | 0.0132 |
| 8 24 | 3 | 0.0038 | 0.0576 | 0.7603 | 0.0228 | 0.0093 | 0.1309 |
| 9 25 | 4 | 0.0064 | 0.2271 | 0.0286 | 0.5984 | 0.0201 | 0.0996 |
| 10 28 | 4 | 0.0225 | 0.1516 | 0.0552 | 0.4026 | 0.0692 | 0.2124 |
| 11 30 | 1 | 0.9331 | 0.0093 | 0.0101 | 0.0117 | 0.0085 | 0.0144 |
| 12 33 | 2 | 0.0012 | 0.8697 | 0.0093 | 0.0837 | 0.0067 | 0.0237 |
| 13 44 | 3 | 0.0158 | 0.0435 | 0.7229 | 0.0301 | 0.0178 | 0.1323 |
| 14 45 | 4 | 0.0045 | 0.0966 | 0.0130 | 0.8174 | 0.0239 | 0.0299 |
| 15 48 | 5 | 0.0440 | 0.1348 | 0.0642 | 0.2036 | 0.3371 | 0.0914 |
| 16 50 | 7 | 0.0168 | 0.0727 | 0.1130 | 0.0577 | 0.0935 | 0.1232 |
| 17 51 | 3 | 0.0043 | 0.0252 | 0.8791 | 0.0140 | 0.0077 | 0.0557 |
| 18 53 | 7 | 0.0047 | 0.0149 | 0.0123 | 0.0177 | 0.0498 | 0.0243 |
| 19 57 | 7 | 0.0243 | 0.0322 | 0.0313 | 0.0398 | 0.0916 | 0.0527 |
| 20 59 | 6 | 0.1288 | 0.0952 | 0.1620 | 0.1045 | 0.0584 | 0.3146 |
| 21 62 | 3 | 0.0054 | 0.1270 | 0.4539 | 0.0428 | 0.0152 | 0.3310 |
| 22 66 | 1 | 0.8443 | 0.0222 | 0.0300 | 0.0246 | 0.0170 | 0.0357 |
| 23 69 | 5 | 0.0357 | 0.0676 | 0.0386 | 0.1078 | 0.5058 | 0.0632 |
| 24 70 | 7 | 0.0186 | 0.0608 | 0.1091 | 0.0508 | 0.0755 | 0.1224 |
| 25 76 | 7 | 0.0084 | 0.0327 | 0.0378 | 0.0298 | 0.0671 | 0.0537 |
| 26 78 | 4 | 0.0600 | 0.1507 | 0.0629 | 0.3193 | 0.1987 | 0.1042 |
| 27 79 | 2 | 0.0019 | 0.7710 | 0.0147 | 0.1463 | 0.0106 | 0.0458 |
| 28 81 | 2 | 0.0028 | 0.7544 | 0.0227 | 0.1397 | 0.0100 | 0.0606 |
| 29 88 | 7 | 0.1448 | 0.0695 | 0.0789 | 0.0861 | 0.1153 | 0.1249 |
| 30 94 | 5 | 0.0014 | 0.0082 | 0.0035 | 0.0115 | 0.9502 | 0.0062 |
| 31 96 | 2 | 0.0063 | 0.4630 | 0.1726 | 0.0810 | 0.0205 | 0.2306 |
| 32 100 | 3 | 0.0045 | 0.0197 | 0.8856 | 0.0120 | 0.0068 | 0.0577 |

**Membership Matrix Section**

| Row | Cluster | Prob in 1 | Prob in 2 | Prob in 3 | Prob in 4 | Prob in 5 | Prob in 6 |
|---|---|---|---|---|---|---|---|
| 33 106 | 4 | 0.0388 | 0.2027 | 0.0725 | 0.3251 | 0.1704 | 0.1044 |
| 34 108 | 5 | 0.0037 | 0.0169 | 0.0073 | 0.0269 | 0.8967 | 0.0128 |
| 35 109 | 7 | 0.0080 | 0.0180 | 0.0142 | 0.0233 | 0.0813 | 0.0265 |
| 36 111 | 6 | 0.0322 | 0.0846 | 0.2330 | 0.0722 | 0.0281 | 0.4943 |
| 37 112 | 2 | 0.0065 | 0.5970 | 0.0382 | 0.2354 | 0.0352 | 0.0631 |
| 38 116 | 6 | 0.0046 | 0.1646 | 0.1503 | 0.0519 | 0.0151 | 0.5894 |
| 39 119 | 5 | 0.0034 | 0.0245 | 0.0097 | 0.0324 | 0.8729 | 0.0166 |
| 40 123 | 6 | 0.0039 | 0.0576 | 0.0423 | 0.0422 | 0.0118 | 0.8196 |
| 41 137 | 6 | 0.0014 | 0.0189 | 0.0338 | 0.0107 | 0.0032 | 0.9259 |
| 42 145 | 4 | 0.0035 | 0.2540 | 0.0151 | 0.6620 | 0.0189 | 0.0337 |
| 43 157 | 1 | 0.6680 | 0.0457 | 0.0470 | 0.0550 | 0.0547 | 0.0587 |
| 44 160 | 5 | 0.0044 | 0.0296 | 0.0140 | 0.0352 | 0.8018 | 0.0242 |
| 45 162 | 6 | 0.0014 | 0.0188 | 0.0249 | 0.0115 | 0.0031 | 0.9345 |
| 46 166 | 7 | 0.0156 | 0.0312 | 0.0231 | 0.0437 | 0.1407 | 0.0446 |
| 47 167 | 7 | 0.0057 | 0.0219 | 0.0165 | 0.0249 | 0.1284 | 0.0290 |
| 48 169 | 4 | 0.0018 | 0.1282 | 0.0082 | 0.8203 | 0.0104 | 0.0233 |
| 49 170 | 7 | 0.0115 | 0.0484 | 0.0629 | 0.0412 | 0.0789 | 0.0814 |

**Membership Matrix Section**

| Row | Cluster | Prob in 7 |
|---|---|---|
| 1 5 | 4 | 0.0194 |
| 2 8 | 2 | 0.0134 |
| 3 9 | 3 | 0.0129 |
| 4 16 | 5 | 0.1765 |
| 5 17 | 2 | 0.0090 |
| 6 18 | 3 | 0.0179 |
| 7 23 | 5 | 0.0694 |
| 8 24 | 3 | 0.0153 |
| 9 25 | 4 | 0.0199 |
| 10 28 | 4 | 0.0864 |
| 11 30 | 1 | 0.0129 |
| 12 33 | 2 | 0.0057 |
| 13 44 | 3 | 0.0377 |
| 14 45 | 4 | 0.0146 |
| 15 48 | 5 | 0.1249 |
| 16 50 | 7 | 0.5230 |
| 17 51 | 3 | 0.0140 |
| 18 53 | 7 | 0.8762 |
| 19 57 | 7 | 0.7280 |
| 20 59 | 6 | 0.1365 |
| 21 62 | 3 | 0.0246 |
| 22 66 | 1 | 0.0262 |
| 23 69 | 5 | 0.1812 |
| 24 70 | 7 | 0.5628 |
| 25 76 | 7 | 0.7705 |
| 26 78 | 4 | 0.1041 |
| 27 79 | 2 | 0.0097 |
| 28 81 | 2 | 0.0098 |
| 29 88 | 7 | 0.3805 |
| 30 94 | 5 | 0.0190 |
| 31 96 | 2 | 0.0260 |
| 32 100 | 3 | 0.0137 |
| 33 106 | 4 | 0.0861 |
| 34 108 | 5 | 0.0357 |
| 35 109 | 7 | 0.8286 |
| 36 111 | 6 | 0.0556 |
| 37 112 | 2 | 0.0246 |
| 38 116 | 6 | 0.0242 |
| 39 119 | 5 | 0.0405 |
| 40 123 | 6 | 0.0226 |
| 41 137 | 6 | 0.0060 |
| 42 145 | 4 | 0.0127 |
| 43 157 | 1 | 0.0709 |
| 44 160 | 5 | 0.0909 |

**Membership Matrix Section**

| Row | Cluster | Prob in 7 |
|---|---|---|
| 45 162 | 6 | 0.0058 |
| 46 166 | 7 | 0.7010 |
| 47 167 | 7 | 0.7735 |
| 48 169 | 4 | 0.0078 |
| 49 170 | 7 | 0.6758 |

**Cluster Medoids Section**

| Variable | Cluster1 | Cluster2 | Cluster3 | Cluster4 | Cluster5 | Cluster6 |
|---|---|---|---|---|---|---|
| Factor1 | -0.6146 | 0.6248 | -1.1904 | 6.8201 | -0.5879 | 0.6786 |
| Factor2 | -1.3633 | -0.0306 | 0.732 | -0.0255 | 1.6774 | -0.6386 |
| Factor3 | -1.3072 | 1.2831 | -1.2667 | -1.5344 | 0.6984 | -0.2163 |
| Row | 32 100 | 48 169 | 49 170 | 11 30 | 30 94 | 45 162 |

**Cluster Medoids Section**

| Variable | Cluster7 | Cluster8 |
|---|---|---|
| Factor1 | -0.1699 | 0.8123 |
| Factor2 | -0.2872 | 1.5092 |
| Factor3 | 1.1 | -0.8698 |
| Row | 12 33 | 35 109 |

**Membership Summary Section for Clusters = 8**

<table>
<tr><th>Row</th><th>Cluster</th><th>Cluster Membership</th><th>Sum of Squared Memberships</th><th>Bar of Squared Memberships</th><th>Silhouette Amount</th><th>Silhouette Bar</th></tr>
<tr><td>32 100</td><td>1</td><td>0.8757</td><td>0.7709</td><td>|IIIIIIIIIIIIIIIIIIIIIII</td><td>0.5221</td><td>|IIIIIIIIIIIIIIII</td></tr>
<tr><td>17 51</td><td>1</td><td>0.8749</td><td>0.7693</td><td>|IIIIIIIIIIIIIIIIIIIIIII</td><td>0.5596</td><td>|IIIIIIIIIIIIIIIII</td></tr>
<tr><td>3 9</td><td>1</td><td>0.8319</td><td>0.7006</td><td>|IIIIIIIIIIIIIIIIIIIII</td><td>0.5101</td><td>|IIIIIIIIIIIIIII</td></tr>
<tr><td>8 24</td><td>1</td><td>0.7697</td><td>0.6099</td><td>|IIIIIIIIIIIIIIIIII</td><td>0.4558</td><td>|IIIIIIIIIIIIII</td></tr>
<tr><td>13 44</td><td>1</td><td>0.6922</td><td>0.5018</td><td>|IIIIIIIIIIIIIII</td><td>0.3610</td><td>|IIIIIIIIIII</td></tr>
<tr><td>6 18</td><td>1</td><td>0.6921</td><td>0.5211</td><td>|IIIIIIIIIIIIIIII</td><td>0.2579</td><td>|IIIIIIII</td></tr>
<tr><td>21 62</td><td>1</td><td>0.4526</td><td>0.3241</td><td>|IIIIIIIIII</td><td>0.2052</td><td>|IIIIII</td></tr>
<tr><td>48 169</td><td>2</td><td>0.8463</td><td>0.7280</td><td>|IIIIIIIIIIIIIIIIIIIIII</td><td>-0.2647</td><td>|</td></tr>
<tr><td>14 45</td><td>2</td><td>0.8229</td><td>0.6866</td><td>|IIIIIIIIIIIIIIIIIIIII</td><td>0.0956</td><td>|III</td></tr>
<tr><td>1 5</td><td>2</td><td>0.7571</td><td>0.5912</td><td>|IIIIIIIIIIIIIIIIII</td><td>-0.1278</td><td>|</td></tr>
<tr><td>42 145</td><td>2</td><td>0.6885</td><td>0.5275</td><td>|IIIIIIIIIIIIIIII</td><td>-0.3216</td><td>|</td></tr>
<tr><td>9 25</td><td>2</td><td>0.6103</td><td>0.4278</td><td>|IIIIIIIIIIIII</td><td>-0.2587</td><td>|</td></tr>
<tr><td>10 28</td><td>2</td><td>0.3780</td><td>0.2223</td><td>|IIIIIII</td><td>-0.1213</td><td>|</td></tr>
<tr><td>33 106</td><td>2</td><td>0.2993</td><td>0.1783</td><td>|IIIII</td><td>0.1320</td><td>|IIII</td></tr>
<tr><td>26 78</td><td>2</td><td>0.2878</td><td>0.1692</td><td>|IIIII</td><td>0.1365</td><td>|IIII</td></tr>
<tr><td>49 170</td><td>3</td><td>0.9790</td><td>0.9586</td><td>|IIIIIIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.7856</td><td>|IIIIIIIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>16 50</td><td>3</td><td>0.9409</td><td>0.8859</td><td>|IIIIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.7698</td><td>|IIIIIIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>25 76</td><td>3</td><td>0.9285</td><td>0.8633</td><td>|IIIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.6628</td><td>|IIIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>24 70</td><td>3</td><td>0.9063</td><td>0.8230</td><td>|IIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.7117</td><td>|IIIIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>11 30</td><td>4</td><td>0.9329</td><td>0.8710</td><td>|IIIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.3557</td><td>|IIIIIIIIIII</td></tr>
</table>

**Membership Summary Section for Clusters = 8**

| Row | Cluster | Cluster Membership | Sum of Squared Memberships | Bar of Squared Memberships | Silhouette Amount | Silhouette Bar |
|---|---|---|---|---|---|---|
| 22 66 | 4 | 0.8512 | 0.7278 | ||||||||||||||||||||||| | 0.2804 | ||||||||| |
| 43 157 | 4 | 0.6001 | 0.3839 | ||||||||||||| | 0.3690 | |||||||||||| |
| 30 94 | 5 | 0.9552 | 0.9128 | |||||||||||||||||||||||||||| | 0.4854 | |||||||||||||||| |
| 34 108 | 5 | 0.8904 | 0.7953 | ||||||||||||||||||||||||| | 0.4892 | |||||||||||||||| |
| 39 119 | 5 | 0.8800 | 0.7771 | |||||||||||||||||||||||| | 0.4658 | ||||||||||||||| |
| 7 23 | 5 | 0.8427 | 0.7172 | ||||||||||||||||||||||| | 0.2986 | |||||||||| |
| 44 160 | 5 | 0.7946 | 0.6398 | |||||||||||||||||||| | 0.2898 | |||||||||| |
| 4 16 | 5 | 0.6685 | 0.4855 | |||||||||||||||| | 0.0330 | || |
| 23 69 | 5 | 0.4279 | 0.2576 | ||||||||| | 0.1975 | ||||||| |
| 15 48 | 5 | 0.3120 | 0.1784 | |||||| | 0.1671 | |||||| |
| 45 162 | 6 | 0.9485 | 0.9003 | |||||||||||||||||||||||||||| | 0.4020 | ||||||||||||| |
| 41 137 | 6 | 0.9404 | 0.8853 | |||||||||||||||||||||||||||| | 0.3334 | ||||||||||| |
| 40 123 | 6 | 0.8183 | 0.6764 | ||||||||||||||||||||| | 0.3213 | ||||||||||| |
| 38 116 | 6 | 0.5851 | 0.3922 | ||||||||||||| | -0.1228 | | |
| 36 111 | 6 | 0.4820 | 0.2970 | |||||||||| | 0.2561 | ||||||||| |
| 20 59 | 6 | 0.2840 | 0.1594 | |||||| | 0.2889 | |||||||||| |
| 12 33 | 7 | 0.8693 | 0.7633 | |||||||||||||||||||||||| | 0.6200 | |||||||||||||||||||| |
| 5 17 | 7 | 0.8623 | 0.7487 | ||||||||||||||||||||||| | 0.6852 | |||||||||||||||||||||| |
| 27 79 | 7 | 0.7628 | 0.6069 | ||||||||||||||||||| | 0.5550 | |||||||||||||||||| |
| 2 8 | 7 | 0.7602 | 0.5933 | ||||||||||||||||||| | 0.5775 | |||||||||||||||||| |
| 28 81 | 7 | 0.7528 | 0.5903 | ||||||||||||||||||| | 0.5716 | |||||||||||||||||| |
| 37 112 | 7 | 0.5876 | 0.4071 | ||||||||||||| | 0.4599 | ||||||||||||||| |
| 31 96 | 7 | 0.4601 | 0.2970 | |||||||||| | 0.3068 | |||||||||| |
| 35 109 | 8 | 0.9542 | 0.9109 | |||||||||||||||||||||||||||| | 0.5218 | ||||||||||||||||| |
| 46 166 | 8 | 0.9224 | 0.8522 | ||||||||||||||||||||||||||| | 0.5435 | ||||||||||||||||| |
| 19 57 | 8 | 0.8364 | 0.7048 | |||||||||||||||||||||| | 0.4865 | |||||||||||||||| |
| 18 53 | 8 | 0.7764 | 0.6154 | ||||||||||||||||||| | 0.2487 | |||||||| |
| 47 167 | 8 | 0.5116 | 0.3303 | ||||||||||| | -0.0015 | | |
| 29 88 | 8 | 0.4269 | 0.2330 | |||||||| | 0.3440 | ||||||||||| |

**Membership Matrix Section**

| Row | Cluster | Prob in 1 | Prob in 2 | Prob in 3 | Prob in 4 | Prob in 5 | Prob in 6 |
|---|---|---|---|---|---|---|---|
| 1 5 | 2 | 0.0155 | 0.7571 | 0.0124 | 0.0040 | 0.0214 | 0.0549 |
| 2 8 | 7 | 0.0465 | 0.0615 | 0.0129 | 0.0029 | 0.0110 | 0.0957 |
| 3 9 | 1 | 0.8319 | 0.0164 | 0.0150 | 0.0031 | 0.0069 | 0.0796 |
| 4 16 | 5 | 0.0127 | 0.0322 | 0.0500 | 0.0054 | 0.6685 | 0.0233 |
| 5 17 | 7 | 0.0195 | 0.0581 | 0.0081 | 0.0019 | 0.0089 | 0.0348 |
| 6 18 | 1 | 0.6921 | 0.0223 | 0.0203 | 0.0064 | 0.0091 | 0.1986 |
| 7 23 | 5 | 0.0075 | 0.0187 | 0.0256 | 0.0037 | 0.8427 | 0.0125 |
| 8 24 | 1 | 0.7697 | 0.0207 | 0.0180 | 0.0035 | 0.0083 | 0.1176 |
| 9 25 | 2 | 0.0268 | 0.6103 | 0.0142 | 0.0061 | 0.0188 | 0.0953 |
| 10 28 | 2 | 0.0527 | 0.3780 | 0.0471 | 0.0220 | 0.0655 | 0.2031 |
| 11 30 | 4 | 0.0087 | 0.0100 | 0.0079 | 0.9329 | 0.0072 | 0.0124 |
| 12 33 | 7 | 0.0087 | 0.0833 | 0.0047 | 0.0012 | 0.0063 | 0.0222 |
| 13 44 | 1 | 0.6922 | 0.0294 | 0.0477 | 0.0158 | 0.0172 | 0.1282 |
| 14 45 | 2 | 0.0120 | 0.8229 | 0.0096 | 0.0042 | 0.0222 | 0.0276 |
| 15 48 | 5 | 0.0583 | 0.1803 | 0.0829 | 0.0398 | 0.3120 | 0.0821 |
| 16 50 | 3 | 0.0105 | 0.0055 | 0.9409 | 0.0016 | 0.0088 | 0.0110 |
| 17 51 | 1 | 0.8749 | 0.0129 | 0.0182 | 0.0041 | 0.0070 | 0.0507 |
| 18 53 | 8 | 0.0135 | 0.0193 | 0.0912 | 0.0053 | 0.0523 | 0.0255 |
| 19 57 | 8 | 0.0130 | 0.0165 | 0.0524 | 0.0102 | 0.0366 | 0.0213 |
| 20 59 | 6 | 0.1459 | 0.0950 | 0.0918 | 0.1211 | 0.0524 | 0.2840 |
| 21 62 | 1 | 0.4526 | 0.0412 | 0.0293 | 0.0053 | 0.0145 | 0.3178 |
| 22 66 | 4 | 0.0250 | 0.0205 | 0.0180 | 0.8512 | 0.0140 | 0.0298 |
| 23 69 | 5 | 0.0339 | 0.0923 | 0.0728 | 0.0311 | 0.4279 | 0.0545 |
| 24 70 | 3 | 0.0166 | 0.0080 | 0.9063 | 0.0030 | 0.0116 | 0.0180 |
| 25 76 | 3 | 0.0070 | 0.0056 | 0.9285 | 0.0016 | 0.0123 | 0.0095 |
| 26 78 | 2 | 0.0584 | 0.2878 | 0.0647 | 0.0556 | 0.1852 | 0.0964 |
| 27 79 | 7 | 0.0142 | 0.1506 | 0.0080 | 0.0019 | 0.0103 | 0.0445 |
| 28 81 | 7 | 0.0214 | 0.1397 | 0.0082 | 0.0027 | 0.0094 | 0.0581 |
| 29 88 | 8 | 0.0583 | 0.0635 | 0.1198 | 0.1058 | 0.0833 | 0.0904 |
| 30 94 | 5 | 0.0027 | 0.0086 | 0.0075 | 0.0011 | 0.9552 | 0.0046 |
| 31 96 | 7 | 0.1678 | 0.0783 | 0.0278 | 0.0060 | 0.0195 | 0.2223 |
| 32 100 | 1 | 0.8757 | 0.0116 | 0.0183 | 0.0044 | 0.0065 | 0.0552 |
| 33 106 | 2 | 0.0680 | 0.2993 | 0.0651 | 0.0364 | 0.1622 | 0.0975 |
| 34 108 | 5 | 0.0065 | 0.0231 | 0.0154 | 0.0033 | 0.8904 | 0.0111 |
| 35 109 | 8 | 0.0028 | 0.0045 | 0.0133 | 0.0016 | 0.0150 | 0.0050 |
| 36 111 | 6 | 0.2180 | 0.0686 | 0.0485 | 0.0314 | 0.0263 | 0.4820 |
| 37 112 | 7 | 0.0366 | 0.2339 | 0.0217 | 0.0063 | 0.0340 | 0.0601 |
| 38 116 | 6 | 0.1442 | 0.0502 | 0.0261 | 0.0045 | 0.0144 | 0.5851 |
| 39 119 | 5 | 0.0080 | 0.0262 | 0.0200 | 0.0028 | 0.8800 | 0.0133 |
| 40 123 | 6 | 0.0391 | 0.0397 | 0.0183 | 0.0037 | 0.0110 | 0.8183 |
| 41 137 | 6 | 0.0254 | 0.0082 | 0.0046 | 0.0011 | 0.0024 | 0.9404 |
| 42 145 | 2 | 0.0136 | 0.6885 | 0.0091 | 0.0031 | 0.0172 | 0.0304 |
| 43 157 | 4 | 0.0474 | 0.0553 | 0.0539 | 0.6001 | 0.0547 | 0.0591 |
| 44 160 | 5 | 0.0127 | 0.0315 | 0.0457 | 0.0041 | 0.7946 | 0.0214 |

**Membership Matrix Section**

| Row | Cluster | Prob in 1 | Prob in 2 | Prob in 3 | Prob in 4 | Prob in 5 | Prob in 6 |
|---|---|---|---|---|---|---|---|
| 45 162 | 6 | 0.0182 | 0.0086 | 0.0041 | 0.0011 | 0.0023 | 0.9485 |
| 46 166 | 8 | 0.0048 | 0.0090 | 0.0174 | 0.0033 | 0.0275 | 0.0090 |
| 47 167 | 8 | 0.0220 | 0.0331 | 0.1934 | 0.0079 | 0.1653 | 0.0372 |
| 48 169 | 2 | 0.0069 | 0.8463 | 0.0049 | 0.0016 | 0.0088 | 0.0196 |
| 49 170 | 3 | 0.0028 | 0.0018 | 0.9790 | 0.0005 | 0.0035 | 0.0034 |

**Membership Matrix Section**

| Row | Cluster | Prob in 7 | Prob in 8 |
|---|---|---|---|
| 1 5 | 2 | 0.1174 | 0.0173 |
| 2 8 | 7 | 0.7602 | 0.0094 |
| 3 9 | 1 | 0.0390 | 0.0079 |
| 4 16 | 5 | 0.0239 | 0.1839 |
| 5 17 | 7 | 0.8623 | 0.0064 |
| 6 18 | 1 | 0.0384 | 0.0128 |
| 7 23 | 5 | 0.0138 | 0.0756 |
| 8 24 | 1 | 0.0527 | 0.0095 |
| 9 25 | 2 | 0.2113 | 0.0172 |
| 10 28 | 2 | 0.1439 | 0.0878 |
| 11 30 | 4 | 0.0080 | 0.0129 |
| 12 33 | 7 | 0.8693 | 0.0043 |
| 13 44 | 1 | 0.0428 | 0.0268 |
| 14 45 | 2 | 0.0881 | 0.0133 |
| 15 48 | 5 | 0.1222 | 0.1224 |
| 16 50 | 3 | 0.0070 | 0.0147 |
| 17 51 | 1 | 0.0234 | 0.0089 |
| 18 53 | 8 | 0.0166 | 0.7764 |
| 19 57 | 8 | 0.0136 | 0.8364 |
| 20 59 | 6 | 0.0872 | 0.1225 |
| 21 62 | 1 | 0.1232 | 0.0162 |
| 22 66 | 4 | 0.0186 | 0.0230 |
| 23 69 | 5 | 0.0593 | 0.2282 |
| 24 70 | 3 | 0.0096 | 0.0269 |
| 25 76 | 3 | 0.0062 | 0.0292 |
| 26 78 | 2 | 0.1395 | 0.1124 |
| 27 79 | 7 | 0.7628 | 0.0076 |
| 28 81 | 7 | 0.7528 | 0.0077 |
| 29 88 | 8 | 0.0521 | 0.4269 |
| 30 94 | 5 | 0.0063 | 0.0140 |
| 31 96 | 7 | 0.4601 | 0.0181 |
| 32 100 | 1 | 0.0191 | 0.0092 |
| 33 106 | 2 | 0.1898 | 0.0817 |
| 34 108 | 5 | 0.0149 | 0.0353 |
| 35 109 | 8 | 0.0036 | 0.9542 |
| 36 111 | 6 | 0.0805 | 0.0448 |

**Membership Matrix Section**

| Row | Cluster | Prob in 7 | Prob in 8 |
|---|---|---|---|
| 37 112 | 7 | 0.5876 | 0.0197 |
| 38 116 | 6 | 0.1594 | 0.0161 |
| 39 119 | 5 | 0.0202 | 0.0295 |
| 40 123 | 6 | 0.0539 | 0.0160 |
| 41 137 | 6 | 0.0144 | 0.0034 |
| 42 145 | 2 | 0.2277 | 0.0103 |
| 43 157 | 4 | 0.0463 | 0.0833 |
| 44 160 | 5 | 0.0270 | 0.0630 |
| 45 162 | 6 | 0.0140 | 0.0033 |
| 46 166 | 8 | 0.0066 | 0.9224 |
| 47 167 | 8 | 0.0296 | 0.5116 |
| 48 169 | 2 | 0.1061 | 0.0059 |
| 49 170 | 3 | 0.0022 | 0.0068 |

**Cluster Medoids Section**

| Variable | Cluster1 | Cluster2 | Cluster3 | Cluster4 | Cluster5 | Cluster6 |
|---|---|---|---|---|---|---|
| Factor1 | -0.5068 | 0.6248 | 0.2071 | 6.8201 | -1.1904 | -0.5879 |
| Factor2 | -0.6832 | -0.0306 | 0.7528 | -0.0255 | 0.732 | 1.6774 |
| Factor3 | 0.6975 | 1.2831 | 4.2587 | -1.5344 | -1.2667 | 0.6984 |
| Row | 2 8 | 48 169 | 33 106 | 11 30 | 49 170 | 30 94 |

**Cluster Medoids Section**

| Variable | Cluster7 | Cluster8 | Cluster9 |
|---|---|---|---|
| Factor1 | 0.8123 | -0.6146 | 2.9376 |
| Factor2 | 1.5092 | -1.3633 | 1.2908 |
| Factor3 | -0.8698 | -1.3072 | -2.0744 |
| Row | 35 109 | 32 100 | 29 88 |

**Membership Summary Section for Clusters = 9**

| Row | Cluster | Cluster Membership | Sum of Squared Memberships | Bar of Squared Memberships | Silhouette Amount | Silhouette Bar |
|---|---|---|---|---|---|---|
| 2 8 | 1 | 0.8548 | 0.7379 | \|IIIIIIIIIIIIIIIIIIIIII | 0.2969 | \|IIIIIIIII |
| 31 96 | 1 | 0.8106 | 0.6680 | \|IIIIIIIIIIIIIIIIIIII | 0.4527 | \|IIIIIIIIIIIIII |
| 38 116 | 1 | 0.7824 | 0.6278 | \|IIIIIIIIIIIIIIIIIII | 0.4916 | \|IIIIIIIIIIIIIII |
| 5 17 | 1 | 0.6063 | 0.4378 | \|IIIIIIIIIIIII | -0.0856 | \| |
| 45 162 | 1 | 0.5743 | 0.3838 | \|IIIIIIIIIIII | 0.3747 | \|IIIIIIIIIII |
| 41 137 | 1 | 0.5400 | 0.3684 | \|IIIIIIIIIII | 0.3402 | \|IIIIIIIIII |
| 40 123 | 1 | 0.5060 | 0.3100 | \|IIIIIIIII | 0.3383 | \|IIIIIIIIII |
| 21 62 | 1 | 0.4774 | 0.3918 | \|IIIIIIIIIIII | 0.2311 | \|IIIIIII |
| 48 169 | 2 | 0.9286 | 0.8637 | \|IIIIIIIIIIIIIIIIIIIIIIIIII | 0.5263 | \|IIIIIIIIIIIIIIII |
| 42 145 | 2 | 0.8474 | 0.7244 | \|IIIIIIIIIIIIIIIIIIIIII | 0.5034 | \|IIIIIIIIIIIIIII |
| 1 5 | 2 | 0.8063 | 0.6601 | \|IIIIIIIIIIIIIIIIIIII | 0.4270 | \|IIIIIIIIIIIII |
| 9 25 | 2 | 0.7572 | 0.5946 | \|IIIIIIIIIIIIIIIIII | 0.3649 | \|IIIIIIIIIII |
| 14 45 | 2 | 0.7324 | 0.5499 | \|IIIIIIIIIIIIIIII | 0.4938 | \|IIIIIIIIIIIIIII |
| 27 79 | 2 | 0.6549 | 0.4997 | \|IIIIIIIIIIIIIII | 0.2479 | \|IIIIIII |
| 12 33 | 2 | 0.6047 | 0.4608 | \|IIIIIIIIIIIIII | 0.2619 | \|IIIIIIII |
| 28 81 | 2 | 0.5168 | 0.4152 | \|IIIIIIIIIIII | 0.1554 | \|IIIII |
| 37 112 | 2 | 0.4974 | 0.3264 | \|IIIIIIIIII | 0.2513 | \|IIIIIIII |
| 10 28 | 2 | 0.3932 | 0.2174 | \|IIIIIII | 0.1913 | \|IIIIII |
| 33 106 | 3 | 0.8023 | 0.6502 | \|IIIIIIIIIIIIIIIIIIII | 0.2308 | \|IIIIIII |
| 26 78 | 3 | 0.7036 | 0.5084 | \|IIIIIIIIIIIIIII | 0.2145 | \|IIIIII |
| 15 48 | 3 | 0.7031 | 0.5095 | \|IIIIIIIIIIIIIII | 0.1537 | \|IIIII |
| 11 30 | 4 | 0.9224 | 0.8518 | \|IIIIIIIIIIIIIIIIIIIIIIIIII | 0.0913 | \|III |
| 22 66 | 4 | 0.8832 | 0.7821 | \|IIIIIIIIIIIIIIIIIIIIIII | 0.1140 | \|III |
| 43 157 | 4 | 0.4456 | 0.2476 | \|IIIIIII | 0.2549 | \|IIIIIIII |
| 49 170 | 5 | 0.9796 | 0.9597 | \|IIIIIIIIIIIIIIIIIIIIIIIIIIIII | 0.7559 | \|IIIIIIIIIIIIIIIIIIIIIII |
| 16 50 | 5 | 0.9464 | 0.8962 | \|IIIIIIIIIIIIIIIIIIIIIIIIIII | 0.7453 | \|IIIIIIIIIIIIIIIIIIIIII |
| 25 76 | 5 | 0.9172 | 0.8430 | \|IIIIIIIIIIIIIIIIIIIIIIIII | 0.6048 | \|IIIIIIIIIIIIIIIIII |
| 24 70 | 5 | 0.9096 | 0.8288 | \|IIIIIIIIIIIIIIIIIIIIIIIII | 0.6862 | \|IIIIIIIIIIIIIIIIIIIII |
| 30 94 | 6 | 0.9615 | 0.9248 | \|IIIIIIIIIIIIIIIIIIIIIIIIIIII | 0.5791 | \|IIIIIIIIIIIIIIIII |
| 39 119 | 6 | 0.8881 | 0.7908 | \|IIIIIIIIIIIIIIIIIIIIIIII | 0.5329 | \|IIIIIIIIIIIIIIII |
| 34 108 | 6 | 0.8644 | 0.7504 | \|IIIIIIIIIIIIIIIIIIIIIII | 0.5480 | \|IIIIIIIIIIIIIIII |
| 7 23 | 6 | 0.8419 | 0.7156 | \|IIIIIIIIIIIIIIIIIIIII | 0.4074 | \|IIIIIIIIIIII |
| 44 160 | 6 | 0.8260 | 0.6882 | \|IIIIIIIIIIIIIIIIIIIII | 0.3938 | \|IIIIIIIIIIII |
| 4 16 | 6 | 0.6705 | 0.4901 | \|IIIIIIIIIIIIIII | 0.1322 | \|IIII |
| 23 69 | 6 | 0.3464 | 0.1962 | \|IIIIII | 0.2042 | \|IIIIII |
| 35 109 | 7 | 0.9610 | 0.9237 | \|IIIIIIIIIIIIIIIIIIIIIIIIIIII | 0.6605 | \|IIIIIIIIIIIIIIIIIIII |
| 46 166 | 7 | 0.9033 | 0.8178 | \|IIIIIIIIIIIIIIIIIIIIIIIII | 0.5761 | \|IIIIIIIIIIIIIIIII |
| 18 53 | 7 | 0.8354 | 0.7038 | \|IIIIIIIIIIIIIIIIIIIII | 0.4565 | \|IIIIIIIIIIIIII |
| 19 57 | 7 | 0.6511 | 0.4601 | \|IIIIIIIIIIIIII | 0.5170 | \|IIIIIIIIIIIIIIII |
| 47 167 | 7 | 0.5923 | 0.3946 | \|IIIIIIIIIIII | 0.2555 | \|IIIIIIII |
| 32 100 | 8 | 0.8823 | 0.7814 | \|IIIIIIIIIIIIIIIIIIIIIII | 0.4872 | \|IIIIIIIIIIIIIII |
| 17 51 | 8 | 0.8495 | 0.7271 | \|IIIIIIIIIIIIIIIIIIIIII | 0.4245 | \|IIIIIIIIIIIII |

**Membership Summary Section for Clusters = 9**

<table>
<tr><th>Row</th><th>Cluster</th><th>Cluster Membership</th><th>Sum of Squared Memberships</th><th>Bar of Squared Memberships</th><th>Silhouette Amount</th><th>Silhouette Bar</th></tr>
<tr><td>6 18</td><td>8</td><td>0.8345</td><td>0.7048</td><td>|IIIIIIIIIIIIIIIIIIIII</td><td>0.2902</td><td>|IIIIIIIII</td></tr>
<tr><td>3 9</td><td>8</td><td>0.8019</td><td>0.6588</td><td>|IIIIIIIIIIIIIIIIIIII</td><td>0.1321</td><td>|IIII</td></tr>
<tr><td>8 24</td><td>8</td><td>0.7384</td><td>0.5774</td><td>|IIIIIIIIIIIIIIIII</td><td>-0.0363</td><td>|</td></tr>
<tr><td>13 44</td><td>8</td><td>0.7335</td><td>0.5508</td><td>|IIIIIIIIIIIIIIIII</td><td>0.4469</td><td>|IIIIIIIIIIIII</td></tr>
<tr><td>36 111</td><td>8</td><td>0.3784</td><td>0.2203</td><td>|IIIIIII</td><td>0.0214</td><td>|I</td></tr>
<tr><td>29 88</td><td>9</td><td>0.9899</td><td>0.9799</td><td>|IIIIIIIIIIIIIIIIIIIIIIIIIIIII</td><td>-0.1613</td><td>|</td></tr>
<tr><td>20 59</td><td>9</td><td>0.2340</td><td>0.1408</td><td>|IIII</td><td>0.0500</td><td>|I</td></tr>
</table>

**Membership Matrix Section**

| Row | Cluster | Prob in 1 | Prob in 2 | Prob in 3 | Prob in 4 | Prob in 5 | Prob in 6 |
|---|---|---|---|---|---|---|---|
| 1 5 | 2 | 0.0902 | 0.8063 | 0.0128 | 0.0044 | 0.0135 | 0.0231 |
| 2 8 | 1 | 0.8548 | 0.0760 | 0.0045 | 0.0020 | 0.0090 | 0.0077 |
| 3 9 | 8 | 0.1201 | 0.0259 | 0.0046 | 0.0038 | 0.0182 | 0.0084 |
| 4 16 | 6 | 0.0207 | 0.0258 | 0.0132 | 0.0045 | 0.0406 | 0.6705 |
| 5 17 | 1 | 0.6063 | 0.2573 | 0.0144 | 0.0048 | 0.0196 | 0.0216 |
| 6 18 | 8 | 0.0849 | 0.0242 | 0.0043 | 0.0056 | 0.0175 | 0.0078 |
| 7 23 | 6 | 0.0118 | 0.0150 | 0.0115 | 0.0032 | 0.0217 | 0.8419 |
| 8 24 | 8 | 0.1746 | 0.0306 | 0.0048 | 0.0039 | 0.0200 | 0.0092 |
| 9 25 | 2 | 0.1395 | 0.7572 | 0.0130 | 0.0057 | 0.0129 | 0.0169 |
| 10 28 | 2 | 0.1827 | 0.3932 | 0.0381 | 0.0249 | 0.0527 | 0.0734 |
| 11 30 | 4 | 0.0080 | 0.0082 | 0.0050 | 0.9224 | 0.0066 | 0.0061 |
| 12 33 | 2 | 0.3059 | 0.6047 | 0.0104 | 0.0032 | 0.0130 | 0.0172 |
| 13 44 | 8 | 0.0830 | 0.0352 | 0.0094 | 0.0165 | 0.0492 | 0.0177 |
| 14 45 | 2 | 0.0869 | 0.7324 | 0.0497 | 0.0079 | 0.0179 | 0.0397 |
| 15 48 | 3 | 0.0329 | 0.0481 | 0.7031 | 0.0130 | 0.0272 | 0.0900 |
| 16 50 | 5 | 0.0087 | 0.0053 | 0.0018 | 0.0014 | 0.9464 | 0.0080 |
| 17 51 | 8 | 0.0628 | 0.0211 | 0.0051 | 0.0055 | 0.0245 | 0.0095 |
| 18 53 | 7 | 0.0141 | 0.0132 | 0.0047 | 0.0035 | 0.0578 | 0.0374 |
| 19 57 | 7 | 0.0192 | 0.0186 | 0.0096 | 0.0113 | 0.0580 | 0.0434 |
| 20 59 | 9 | 0.1280 | 0.0937 | 0.0267 | 0.1179 | 0.0850 | 0.0492 |
| 21 62 | 1 | 0.4774 | 0.0503 | 0.0062 | 0.0045 | 0.0251 | 0.0125 |
| 22 66 | 4 | 0.0147 | 0.0133 | 0.0073 | 0.8832 | 0.0116 | 0.0090 |
| 23 69 | 6 | 0.0502 | 0.0701 | 0.1178 | 0.0269 | 0.0643 | 0.3464 |
| 24 70 | 5 | 0.0131 | 0.0080 | 0.0027 | 0.0027 | 0.9096 | 0.0110 |
| 25 76 | 5 | 0.0087 | 0.0063 | 0.0022 | 0.0017 | 0.9172 | 0.0137 |
| 26 78 | 3 | 0.0382 | 0.0703 | 0.7036 | 0.0189 | 0.0223 | 0.0578 |
| 27 79 | 2 | 0.2637 | 0.6549 | 0.0084 | 0.0029 | 0.0121 | 0.0155 |
| 28 81 | 2 | 0.3820 | 0.5168 | 0.0110 | 0.0043 | 0.0130 | 0.0147 |
| 29 88 | 9 | 0.0008 | 0.0007 | 0.0004 | 0.0012 | 0.0014 | 0.0010 |
| 30 94 | 6 | 0.0043 | 0.0060 | 0.0044 | 0.0008 | 0.0056 | 0.9615 |
| 31 96 | 1 | 0.8106 | 0.0613 | 0.0054 | 0.0029 | 0.0134 | 0.0094 |
| 32 100 | 8 | 0.0457 | 0.0158 | 0.0038 | 0.0050 | 0.0207 | 0.0073 |

**Membership Matrix Section**

| Row | Cluster | Prob in 1 | Prob in 2 | Prob in 3 | Prob in 4 | Prob in 5 | Prob in 6 |
|---|---|---|---|---|---|---|---|
| 33 106 | 3 | 0.0320 | 0.0547 | 0.8023 | 0.0088 | 0.0157 | 0.0358 |
| 34 108 | 6 | 0.0137 | 0.0209 | 0.0225 | 0.0034 | 0.0160 | 0.8644 |
| 35 109 | 7 | 0.0029 | 0.0030 | 0.0014 | 0.0011 | 0.0087 | 0.0108 |
| 36 111 | 8 | 0.2228 | 0.1066 | 0.0203 | 0.0434 | 0.0642 | 0.0349 |
| 37 112 | 2 | 0.2628 | 0.4974 | 0.0464 | 0.0093 | 0.0317 | 0.0489 |
| 38 116 | 1 | 0.7824 | 0.0532 | 0.0045 | 0.0031 | 0.0178 | 0.0099 |
| 39 119 | 6 | 0.0146 | 0.0208 | 0.0140 | 0.0024 | 0.0169 | 0.8881 |
| 40 123 | 1 | 0.5060 | 0.1609 | 0.0133 | 0.0111 | 0.0538 | 0.0327 |
| 41 137 | 1 | 0.5400 | 0.0860 | 0.0088 | 0.0086 | 0.0347 | 0.0183 |
| 42 145 | 2 | 0.0718 | 0.8474 | 0.0172 | 0.0033 | 0.0096 | 0.0176 |
| 43 157 | 4 | 0.0516 | 0.0533 | 0.0477 | 0.4456 | 0.0544 | 0.0550 |
| 44 160 | 6 | 0.0201 | 0.0241 | 0.0119 | 0.0032 | 0.0349 | 0.8260 |
| 45 162 | 1 | 0.5743 | 0.1013 | 0.0096 | 0.0092 | 0.0348 | 0.0198 |
| 46 166 | 7 | 0.0073 | 0.0081 | 0.0041 | 0.0031 | 0.0160 | 0.0271 |
| 47 167 | 7 | 0.0276 | 0.0261 | 0.0111 | 0.0061 | 0.1423 | 0.1432 |
| 48 169 | 2 | 0.0361 | 0.9286 | 0.0057 | 0.0015 | 0.0045 | 0.0080 |
| 49 170 | 5 | 0.0028 | 0.0018 | 0.0006 | 0.0005 | 0.9796 | 0.0033 |

**Membership Matrix Section**

| Row | Cluster | Prob in 7 | Prob in 8 | Prob in 9 |
|---|---|---|---|---|
| 1 5 | 2 | 0.0198 | 0.0193 | 0.0105 |
| 2 8 | 1 | 0.0068 | 0.0351 | 0.0041 |
| 3 9 | 8 | 0.0097 | 0.8019 | 0.0073 |
| 4 16 | 6 | 0.1925 | 0.0117 | 0.0204 |
| 5 17 | 1 | 0.0162 | 0.0504 | 0.0094 |
| 6 18 | 8 | 0.0110 | 0.8345 | 0.0101 |
| 7 23 | 6 | 0.0751 | 0.0070 | 0.0128 |
| 8 24 | 8 | 0.0107 | 0.7384 | 0.0077 |
| 9 25 | 2 | 0.0161 | 0.0280 | 0.0108 |
| 10 28 | 2 | 0.1002 | 0.0692 | 0.0655 |
| 11 30 | 4 | 0.0101 | 0.0080 | 0.0256 |
| 12 33 | 2 | 0.0125 | 0.0262 | 0.0068 |
| 13 44 | 8 | 0.0271 | 0.7335 | 0.0285 |
| 14 45 | 2 | 0.0257 | 0.0246 | 0.0152 |
| 15 48 | 3 | 0.0410 | 0.0203 | 0.0245 |
| 16 50 | 5 | 0.0137 | 0.0094 | 0.0053 |
| 17 51 | 8 | 0.0120 | 0.8495 | 0.0100 |
| 18 53 | 7 | 0.8354 | 0.0099 | 0.0239 |
| 19 57 | 7 | 0.6511 | 0.0164 | 0.1724 |
| 20 59 | 9 | 0.1062 | 0.1593 | 0.2340 |
| 21 62 | 1 | 0.0142 | 0.4003 | 0.0095 |
| 22 66 | 4 | 0.0140 | 0.0174 | 0.0295 |
| 23 69 | 6 | 0.2025 | 0.0327 | 0.0890 |
| 24 70 | 5 | 0.0256 | 0.0158 | 0.0114 |
| 25 76 | 5 | 0.0346 | 0.0077 | 0.0079 |
| 26 78 | 3 | 0.0385 | 0.0216 | 0.0287 |
| 27 79 | 2 | 0.0122 | 0.0237 | 0.0065 |
| 28 81 | 2 | 0.0127 | 0.0373 | 0.0081 |
| 29 88 | 9 | 0.0038 | 0.0008 | 0.9899 |
| 30 94 | 6 | 0.0121 | 0.0022 | 0.0028 |
| 31 96 | 1 | 0.0090 | 0.0821 | 0.0058 |
| 32 100 | 8 | 0.0103 | 0.8823 | 0.0093 |
| 33 106 | 3 | 0.0201 | 0.0171 | 0.0135 |
| 34 108 | 6 | 0.0406 | 0.0074 | 0.0111 |
| 35 109 | 7 | 0.9610 | 0.0021 | 0.0089 |
| 36 111 | 8 | 0.0580 | 0.3784 | 0.0712 |
| 37 112 | 2 | 0.0303 | 0.0559 | 0.0174 |
| 38 116 | 1 | 0.0114 | 0.1108 | 0.0070 |
| 39 119 | 6 | 0.0284 | 0.0073 | 0.0076 |
| 40 123 | 1 | 0.0488 | 0.1431 | 0.0302 |
| 41 137 | 1 | 0.0261 | 0.2582 | 0.0194 |
| 42 145 | 2 | 0.0113 | 0.0152 | 0.0065 |
| 43 157 | 4 | 0.0793 | 0.0505 | 0.1627 |
| 44 160 | 6 | 0.0579 | 0.0105 | 0.0114 |

**Membership Matrix Section**

| Row | Cluster | Prob in 7 | Prob in 8 | Prob in 9 |
|---|---|---|---|---|
| 45 162 | 1 | 0.0283 | 0.2017 | 0.0211 |
| 46 166 | 7 | 0.9033 | 0.0050 | 0.0260 |
| 47 167 | 7 | 0.5923 | 0.0184 | 0.0329 |
| 48 169 | 2 | 0.0057 | 0.0069 | 0.0031 |
| 49 170 | 5 | 0.0068 | 0.0026 | 0.0020 |

**Cluster Medoids Section**

| Variable | Cluster1 | Cluster2 | Cluster3 | Cluster4 | Cluster5 | Cluster6 |
|---|---|---|---|---|---|---|
| Factor1 | -0.708 | 0.6248 | 0.2071 | 6.8201 | -1.1904 | -0.5879 |
| Factor2 | -0.5655 | -0.0306 | 0.7528 | -0.0255 | 0.732 | 1.6774 |
| Factor3 | 1.1284 | 1.2831 | 4.2587 | -1.5344 | -1.2667 | 0.6984 |
| Row | 5 17 | 48 169 | 33 106 | 11 30 | 49 170 | 30 94 |

**Cluster Medoids Section**

| Variable | Cluster7 | Cluster8 | Cluster9 | Cluster10 |
|---|---|---|---|---|
| Factor1 | -0.0155 | -0.6146 | 0.6786 | 0.8123 |
| Factor2 | 1.5641 | -1.3633 | -0.6386 | 1.5092 |
| Factor3 | 0.024 | -1.3072 | -0.2163 | -0.8698 |
| Row | 4 16 | 32 100 | 45 162 | 35 109 |

**Membership Summary Section for Clusters = 10**

<table>
<tr><th>Row</th><th>Cluster</th><th>Cluster Membership</th><th>Sum of Squared Memberships</th><th>Bar of Squared Memberships</th><th>Silhouette Amount</th><th>Silhouette Bar</th></tr>
<tr><td>5 17</td><td>1</td><td>0.8749</td><td>0.7694</td><td>||||||||||||||||||||||||</td><td>0.5602</td><td>||||||||||||||||||</td></tr>
<tr><td>12 33</td><td>1</td><td>0.8289</td><td>0.7004</td><td>||||||||||||||||||||||</td><td>0.3840</td><td>|||||||||||||</td></tr>
<tr><td>2 8</td><td>1</td><td>0.8146</td><td>0.6718</td><td>|||||||||||||||||||||</td><td>0.5536</td><td>||||||||||||||||||</td></tr>
<tr><td>28 81</td><td>1</td><td>0.7147</td><td>0.5441</td><td>|||||||||||||||||</td><td>0.3035</td><td>||||||||||</td></tr>
<tr><td>27 79</td><td>1</td><td>0.6901</td><td>0.5226</td><td>|||||||||||||||||</td><td>0.2381</td><td>||||||||</td></tr>
<tr><td>37 112</td><td>1</td><td>0.5360</td><td>0.3494</td><td>|||||||||||</td><td>0.2919</td><td>||||||||||</td></tr>
<tr><td>31 96</td><td>1</td><td>0.5192</td><td>0.3290</td><td>|||||||||||</td><td>0.3068</td><td>||||||||||</td></tr>
<tr><td>48 169</td><td>2</td><td>0.9056</td><td>0.8236</td><td>||||||||||||||||||||||||||</td><td>0.3198</td><td>|||||||||||</td></tr>
<tr><td>1 5</td><td>2</td><td>0.8140</td><td>0.6705</td><td>|||||||||||||||||||||</td><td>0.4238</td><td>||||||||||||||</td></tr>
<tr><td>14 45</td><td>2</td><td>0.7538</td><td>0.5801</td><td>||||||||||||||||||</td><td>0.3962</td><td>|||||||||||||</td></tr>
<tr><td>42 145</td><td>2</td><td>0.7048</td><td>0.5332</td><td>|||||||||||||||||</td><td>0.0863</td><td>||||</td></tr>
<tr><td>9 25</td><td>2</td><td>0.7048</td><td>0.5228</td><td>|||||||||||||||||</td><td>0.2862</td><td>||||||||||</td></tr>
<tr><td>10 28</td><td>2</td><td>0.3717</td><td>0.2010</td><td>|||||||</td><td>0.2631</td><td>|||||||||</td></tr>
<tr><td>33 106</td><td>3</td><td>0.7545</td><td>0.5778</td><td>||||||||||||||||||</td><td>0.2220</td><td>||||||||</td></tr>
<tr><td>15 48</td><td>3</td><td>0.7257</td><td>0.5380</td><td>|||||||||||||||||</td><td>0.1243</td><td>|||||</td></tr>
<tr><td>26 78</td><td>3</td><td>0.5946</td><td>0.3758</td><td>||||||||||||</td><td>0.1470</td><td>|||||</td></tr>
<tr><td>11 30</td><td>4</td><td>0.9310</td><td>0.8674</td><td>|||||||||||||||||||||||||||</td><td>0.3557</td><td>||||||||||||</td></tr>
<tr><td>22 66</td><td>4</td><td>0.8692</td><td>0.7576</td><td>||||||||||||||||||||||||</td><td>0.2804</td><td>|||||||||</td></tr>
<tr><td>43 157</td><td>4</td><td>0.4875</td><td>0.2682</td><td>|||||||||</td><td>0.3487</td><td>|||||||||||</td></tr>
<tr><td>49 170</td><td>5</td><td>0.9773</td><td>0.9552</td><td>||||||||||||||||||||||||||||||</td><td>0.8007</td><td>|||||||||||||||||||||||||</td></tr>
</table>

**Membership Summary Section for Clusters = 10**

<table>
<tr><th>Row</th><th>Cluster</th><th>Cluster Membership</th><th>Sum of Squared Memberships</th><th>Bar of Squared Memberships</th><th>Silhouette Amount</th><th>Silhouette Bar</th></tr>
<tr><td>16 50</td><td>5</td><td>0.9389</td><td>0.8821</td><td>|||||||||||||||||||||||||||</td><td>0.7833</td><td>||||||||||||||||||||||||</td></tr>
<tr><td>25 76</td><td>5</td><td>0.9095</td><td>0.8286</td><td>||||||||||||||||||||||||||</td><td>0.6902</td><td>||||||||||||||||||||||</td></tr>
<tr><td>24 70</td><td>5</td><td>0.9016</td><td>0.8143</td><td>|||||||||||||||||||||||||</td><td>0.7243</td><td>|||||||||||||||||||||||</td></tr>
<tr><td>30 94</td><td>6</td><td>0.9461</td><td>0.8967</td><td>||||||||||||||||||||||||||||</td><td>0.6063</td><td>|||||||||||||||||||</td></tr>
<tr><td>39 119</td><td>6</td><td>0.9085</td><td>0.8282</td><td>||||||||||||||||||||||||||</td><td>0.6193</td><td>||||||||||||||||||||</td></tr>
<tr><td>34 108</td><td>6</td><td>0.7184</td><td>0.5511</td><td>||||||||||||||||||</td><td>0.3747</td><td>||||||||||||</td></tr>
<tr><td>44 160</td><td>6</td><td>0.5861</td><td>0.4254</td><td>||||||||||||||</td><td>0.4155</td><td>|||||||||||||</td></tr>
<tr><td>4 16</td><td>7</td><td>0.9038</td><td>0.8200</td><td>||||||||||||||||||||||||||</td><td>-0.1743</td><td>|</td></tr>
<tr><td>7 23</td><td>7</td><td>0.7978</td><td>0.6577</td><td>|||||||||||||||||||||</td><td>-0.2652</td><td>|</td></tr>
<tr><td>47 167</td><td>7</td><td>0.3703</td><td>0.2500</td><td>||||||||</td><td>-0.1389</td><td>|</td></tr>
<tr><td>23 69</td><td>7</td><td>0.3137</td><td>0.1876</td><td>|||||||</td><td>0.0002</td><td>|</td></tr>
<tr><td>32 100</td><td>8</td><td>0.8813</td><td>0.7799</td><td>||||||||||||||||||||||||</td><td>0.5221</td><td>|||||||||||||||||</td></tr>
<tr><td>17 51</td><td>8</td><td>0.8766</td><td>0.7716</td><td>||||||||||||||||||||||||</td><td>0.5596</td><td>||||||||||||||||||</td></tr>
<tr><td>3 9</td><td>8</td><td>0.8092</td><td>0.6645</td><td>|||||||||||||||||||||</td><td>0.5101</td><td>||||||||||||||||</td></tr>
<tr><td>8 24</td><td>8</td><td>0.7345</td><td>0.5604</td><td>||||||||||||||||||</td><td>0.4558</td><td>|||||||||||||||</td></tr>
<tr><td>13 44</td><td>8</td><td>0.6864</td><td>0.4914</td><td>||||||||||||||||</td><td>0.3610</td><td>||||||||||||</td></tr>
<tr><td>6 18</td><td>8</td><td>0.6703</td><td>0.4940</td><td>||||||||||||||||</td><td>0.2579</td><td>|||||||||</td></tr>
<tr><td>21 62</td><td>8</td><td>0.4053</td><td>0.2916</td><td>||||||||||</td><td>0.2052</td><td>|||||||</td></tr>
<tr><td>45 162</td><td>9</td><td>0.9565</td><td>0.9153</td><td>||||||||||||||||||||||||||||</td><td>0.4020</td><td>|||||||||||||</td></tr>
<tr><td>41 137</td><td>9</td><td>0.9521</td><td>0.9070</td><td>||||||||||||||||||||||||||||</td><td>0.3334</td><td>|||||||||||</td></tr>
<tr><td>40 123</td><td>9</td><td>0.8007</td><td>0.6483</td><td>||||||||||||||||||||</td><td>0.3213</td><td>|||||||||||</td></tr>
<tr><td>38 116</td><td>9</td><td>0.5621</td><td>0.3680</td><td>||||||||||||</td><td>-0.1228</td><td>|</td></tr>
<tr><td>36 111</td><td>9</td><td>0.4650</td><td>0.2744</td><td>|||||||||</td><td>0.2561</td><td>|||||||||</td></tr>
<tr><td>20 59</td><td>9</td><td>0.2559</td><td>0.1366</td><td>|||||</td><td>0.2889</td><td>||||||||||</td></tr>
<tr><td>35 109</td><td>10</td><td>0.9313</td><td>0.8686</td><td>|||||||||||||||||||||||||||</td><td>0.3677</td><td>||||||||||||</td></tr>
<tr><td>46 166</td><td>10</td><td>0.8909</td><td>0.7969</td><td>|||||||||||||||||||||||||</td><td>0.3448</td><td>|||||||||||</td></tr>
<tr><td>19 57</td><td>10</td><td>0.8424</td><td>0.7141</td><td>||||||||||||||||||||||</td><td>0.5138</td><td>||||||||||||||||</td></tr>
<tr><td>18 53</td><td>10</td><td>0.6424</td><td>0.4420</td><td>||||||||||||||</td><td>0.1631</td><td>||||||</td></tr>
<tr><td>29 88</td><td>10</td><td>0.4107</td><td>0.2127</td><td>|||||||</td><td>0.3990</td><td>|||||||||||||</td></tr>
</table>

**Membership Matrix Section**

| Row | Cluster | Prob in 1 | Prob in 2 | Prob in 3 | Prob in 4 | Prob in 5 | Prob in 6 |
|---|---|---|---|---|---|---|---|
| 1 5 | 2 | 0.0753 | 0.8140 | 0.0079 | 0.0030 | 0.0088 | 0.0153 |
| 2 8 | 1 | 0.8146 | 0.0514 | 0.0043 | 0.0021 | 0.0090 | 0.0080 |
| 3 9 | 8 | 0.0448 | 0.0183 | 0.0037 | 0.0032 | 0.0151 | 0.0071 |
| 4 16 | 7 | 0.0034 | 0.0046 | 0.0023 | 0.0008 | 0.0070 | 0.0517 |
| 5 17 | 1 | 0.8749 | 0.0525 | 0.0045 | 0.0016 | 0.0063 | 0.0074 |
| 6 18 | 8 | 0.0402 | 0.0239 | 0.0047 | 0.0063 | 0.0194 | 0.0086 |
| 7 23 | 7 | 0.0051 | 0.0067 | 0.0050 | 0.0014 | 0.0094 | 0.1432 |
| 8 24 | 8 | 0.0623 | 0.0237 | 0.0044 | 0.0037 | 0.0185 | 0.0087 |
| 9 25 | 2 | 0.1428 | 0.7048 | 0.0099 | 0.0047 | 0.0104 | 0.0140 |
| 10 28 | 2 | 0.1213 | 0.3717 | 0.0280 | 0.0199 | 0.0411 | 0.0551 |
| 11 30 | 4 | 0.0068 | 0.0085 | 0.0047 | 0.9310 | 0.0066 | 0.0058 |
| 12 33 | 1 | 0.8289 | 0.1123 | 0.0038 | 0.0013 | 0.0049 | 0.0069 |
| 13 44 | 8 | 0.0411 | 0.0286 | 0.0081 | 0.0146 | 0.0433 | 0.0153 |
| 14 45 | 2 | 0.0912 | 0.7538 | 0.0288 | 0.0051 | 0.0113 | 0.0266 |
| 15 48 | 3 | 0.0276 | 0.0362 | 0.7257 | 0.0095 | 0.0196 | 0.0690 |
| 16 50 | 5 | 0.0061 | 0.0048 | 0.0017 | 0.0014 | 0.9389 | 0.0071 |
| 17 51 | 8 | 0.0222 | 0.0122 | 0.0033 | 0.0036 | 0.0159 | 0.0061 |
| 18 53 | 10 | 0.0172 | 0.0204 | 0.0072 | 0.0055 | 0.0899 | 0.0444 |
| 19 57 | 10 | 0.0091 | 0.0111 | 0.0054 | 0.0068 | 0.0341 | 0.0206 |
| 20 59 | 9 | 0.0798 | 0.0912 | 0.0248 | 0.1136 | 0.0819 | 0.0448 |
| 21 62 | 8 | 0.1420 | 0.0457 | 0.0069 | 0.0052 | 0.0284 | 0.0143 |
| 22 66 | 4 | 0.0138 | 0.0154 | 0.0080 | 0.8692 | 0.0132 | 0.0099 |
| 23 69 | 7 | 0.0394 | 0.0572 | 0.0888 | 0.0211 | 0.0490 | 0.2255 |
| 24 70 | 5 | 0.0086 | 0.0073 | 0.0026 | 0.0026 | 0.9016 | 0.0096 |
| 25 76 | 5 | 0.0063 | 0.0058 | 0.0021 | 0.0016 | 0.9095 | 0.0113 |
| 26 78 | 3 | 0.0493 | 0.0869 | 0.5946 | 0.0211 | 0.0244 | 0.0655 |
| 27 79 | 1 | 0.6901 | 0.2095 | 0.0054 | 0.0020 | 0.0080 | 0.0108 |
| 28 81 | 1 | 0.7147 | 0.1726 | 0.0062 | 0.0026 | 0.0076 | 0.0090 |
| 29 88 | 10 | 0.0426 | 0.0524 | 0.0263 | 0.0841 | 0.0966 | 0.0609 |
| 30 94 | 6 | 0.0020 | 0.0026 | 0.0018 | 0.0004 | 0.0023 | 0.9461 |
| 31 96 | 1 | 0.5192 | 0.0760 | 0.0092 | 0.0052 | 0.0232 | 0.0169 |
| 32 100 | 8 | 0.0175 | 0.0107 | 0.0028 | 0.0038 | 0.0156 | 0.0054 |
| 33 106 | 3 | 0.0413 | 0.0560 | 0.7545 | 0.0087 | 0.0153 | 0.0379 |
| 34 108 | 6 | 0.0115 | 0.0167 | 0.0169 | 0.0027 | 0.0121 | 0.7184 |
| 35 109 | 10 | 0.0030 | 0.0038 | 0.0017 | 0.0013 | 0.0107 | 0.0098 |
| 36 111 | 9 | 0.0782 | 0.0708 | 0.0138 | 0.0304 | 0.0448 | 0.0238 |
| 37 112 | 1 | 0.5360 | 0.2317 | 0.0301 | 0.0063 | 0.0211 | 0.0355 |
| 38 116 | 9 | 0.1772 | 0.0554 | 0.0061 | 0.0043 | 0.0243 | 0.0137 |
| 39 119 | 6 | 0.0061 | 0.0076 | 0.0051 | 0.0009 | 0.0062 | 0.9085 |
| 40 123 | 9 | 0.0543 | 0.0454 | 0.0042 | 0.0037 | 0.0173 | 0.0103 |
| 41 137 | 9 | 0.0116 | 0.0071 | 0.0008 | 0.0008 | 0.0034 | 0.0018 |
| 42 145 | 2 | 0.1858 | 0.7048 | 0.0150 | 0.0031 | 0.0088 | 0.0173 |
| 43 157 | 4 | 0.0463 | 0.0550 | 0.0461 | 0.4875 | 0.0540 | 0.0523 |
| 44 160 | 6 | 0.0170 | 0.0195 | 0.0097 | 0.0027 | 0.0283 | 0.5861 |

**Membership Matrix Section**

| Row | Cluster | Prob in 1 | Prob in 2 | Prob in 3 | Prob in 4 | Prob in 5 | Prob in 6 |
|---|---|---|---|---|---|---|---|
| 45 162 | 9 | 0.0115 | 0.0077 | 0.0008 | 0.0008 | 0.0031 | 0.0017 |
| 46 166 | 10 | 0.0051 | 0.0070 | 0.0033 | 0.0026 | 0.0132 | 0.0167 |
| 47 167 | 7 | 0.0223 | 0.0250 | 0.0104 | 0.0060 | 0.1368 | 0.0977 |
| 48 169 | 2 | 0.0563 | 0.9056 | 0.0036 | 0.0010 | 0.0030 | 0.0057 |
| 49 170 | 5 | 0.0019 | 0.0017 | 0.0006 | 0.0005 | 0.9773 | 0.0028 |

**Membership Matrix Section**

| Row | Cluster | Prob in 7 | Prob in 8 | Prob in 9 | Prob in 10 |
|---|---|---|---|---|---|
| 1 5 | 2 | 0.0155 | 0.0110 | 0.0375 | 0.0116 |
| 2 8 | 1 | 0.0077 | 0.0314 | 0.0653 | 0.0062 |
| 3 9 | 8 | 0.0076 | 0.8092 | 0.0833 | 0.0077 |
| 4 16 | 7 | 0.9038 | 0.0019 | 0.0034 | 0.0212 |
| 5 17 | 1 | 0.0065 | 0.0150 | 0.0266 | 0.0047 |
| 6 18 | 8 | 0.0101 | 0.6703 | 0.2044 | 0.0121 |
| 7 23 | 7 | 0.7978 | 0.0029 | 0.0047 | 0.0239 |
| 8 24 | 8 | 0.0094 | 0.7345 | 0.1255 | 0.0094 |
| 9 25 | 2 | 0.0142 | 0.0196 | 0.0675 | 0.0122 |
| 10 28 | 2 | 0.0694 | 0.0465 | 0.1722 | 0.0747 |
| 11 30 | 4 | 0.0074 | 0.0074 | 0.0104 | 0.0114 |
| 12 33 | 1 | 0.0062 | 0.0090 | 0.0224 | 0.0043 |
| 13 44 | 8 | 0.0184 | 0.6864 | 0.1201 | 0.0240 |
| 14 45 | 2 | 0.0227 | 0.0142 | 0.0315 | 0.0148 |
| 15 48 | 3 | 0.0517 | 0.0141 | 0.0193 | 0.0273 |
| 16 50 | 5 | 0.0102 | 0.0089 | 0.0093 | 0.0116 |
| 17 51 | 8 | 0.0069 | 0.8766 | 0.0456 | 0.0075 |
| 18 53 | 10 | 0.1327 | 0.0141 | 0.0263 | 0.6424 |
| 19 57 | 10 | 0.0474 | 0.0088 | 0.0142 | 0.8424 |
| 20 59 | 9 | 0.0620 | 0.1317 | 0.2559 | 0.1143 |
| 21 62 | 8 | 0.0155 | 0.4053 | 0.3218 | 0.0150 |
| 22 66 | 4 | 0.0121 | 0.0186 | 0.0221 | 0.0176 |
| 23 69 | 7 | 0.3137 | 0.0236 | 0.0370 | 0.1447 |
| 24 70 | 5 | 0.0148 | 0.0146 | 0.0157 | 0.0227 |
| 25 76 | 5 | 0.0203 | 0.0070 | 0.0095 | 0.0265 |
| 26 78 | 3 | 0.0593 | 0.0224 | 0.0359 | 0.0406 |
| 27 79 | 1 | 0.0100 | 0.0141 | 0.0429 | 0.0072 |
| 28 81 | 1 | 0.0086 | 0.0195 | 0.0523 | 0.0069 |
| 29 88 | 10 | 0.1046 | 0.0482 | 0.0736 | 0.4107 |
| 30 94 | 6 | 0.0386 | 0.0009 | 0.0015 | 0.0038 |
| 31 96 | 1 | 0.0168 | 0.1338 | 0.1851 | 0.0145 |
| 32 100 | 8 | 0.0064 | 0.8813 | 0.0488 | 0.0077 |
| 33 106 | 3 | 0.0292 | 0.0162 | 0.0226 | 0.0182 |
| 34 108 | 6 | 0.1829 | 0.0053 | 0.0088 | 0.0247 |
| 35 109 | 10 | 0.0320 | 0.0024 | 0.0042 | 0.9313 |
| 36 111 | 9 | 0.0297 | 0.2019 | 0.4650 | 0.0416 |

## Fuzzy Clustering Report

**Membership Matrix Section**

| Row | Cluster | Prob in 7 | Prob in 8 | Prob in 9 | Prob in 10 |
|---|---|---|---|---|---|
| 37 112 | 1 | 0.0282 | 0.0355 | 0.0574 | 0.0182 |
| 38 116 | 9 | 0.0150 | 0.1275 | 0.5621 | 0.0144 |
| 39 119 | 6 | 0.0507 | 0.0026 | 0.0041 | 0.0081 |
| 40 123 | 9 | 0.0129 | 0.0365 | 0.8007 | 0.0147 |
| 41 137 | 9 | 0.0021 | 0.0179 | 0.9521 | 0.0024 |
| 42 145 | 2 | 0.0144 | 0.0131 | 0.0284 | 0.0094 |
| 43 157 | 4 | 0.0641 | 0.0481 | 0.0594 | 0.0873 |
| 44 160 | 6 | 0.2810 | 0.0083 | 0.0136 | 0.0339 |
| 45 162 | 9 | 0.0021 | 0.0134 | 0.9565 | 0.0024 |
| 46 166 | 10 | 0.0504 | 0.0038 | 0.0070 | 0.8909 |
| 47 167 | 7 | 0.3703 | 0.0168 | 0.0278 | 0.2868 |
| 48 169 | 2 | 0.0051 | 0.0043 | 0.0118 | 0.0035 |
| 49 170 | 5 | 0.0045 | 0.0024 | 0.0030 | 0.0054 |

**Summary Section**

| Number Clusters | Average Distance | Average Silhouette | F(U) | Fc(U) | D(U) | Dc(U) |
|---|---|---|---|---|---|---|
| 2 | 20.173637 | 0.336025 | 0.7118 | 0.4235 | 0.1099 | 0.2198 |
| 3 | 16.015494 | 0.296582 | 0.6224 | 0.4337 | 0.1489 | 0.2234 |
| 4 | 13.516823 | 0.301727 | 0.5932 | 0.4576 | 0.1555 | 0.2074 |
| 5 | 11.419911 | 0.377129 | 0.6320 | 0.5400 | 0.1185 | 0.1482 |
| 6 | 10.299670 | 0.278260 | 0.5527 | 0.4632 | 0.1838 | 0.2206 |
| 7 | 9.356878 | 0.310264 | 0.5565 | 0.4825 | 0.1605 | 0.1872 |
| 8 | 8.333453 | 0.324510 | 0.5912 | 0.5328 | 0.1524 | 0.1742 |
| 9 | 7.705769 | 0.339433 | 0.6023 | 0.5526 | 0.1406 | 0.1582 |
| 10 | 7.088657 | 0.336062 | 0.5926 | 0.5473 | 0.1407 | 0.1563 |

# Appendix A4.5

**Fuzzy Clustering Report - Full**

**Cluster Medoids Section**

| Variable | Cluster1 | Cluster2 | Cluster3 | Cluster4 | Cluster5 | Cluster6 |
|---|---|---|---|---|---|---|
| Factor1 | 0.5256 | -0.0853 | -0.6146 | -1.0643 | 5.0024 | -0.0685 |
| Factor2 | -0.6873 | -0.4938 | -1.3633 | 0.9779 | 0.1069 | 1.9193 |
| Factor3 | -0.2856 | 0.7214 | -1.3072 | -0.8536 | -1.6136 | 0.9364 |
| Row | 24 137 | 117 149 | 171 100 | 123 153 | 1 63 | 36 108 |

**Cluster Medoids Section**

| Variable | Cluster7 |
|---|---|
| Factor1 | 1.0327 |
| Factor2 | -0.14 |
| Factor3 | 1.0032 |
| Row | 147 60 |

**Membership Summary Section for Clusters = 7**

<table>
<tr><th>Row</th><th>Cluster</th><th>Cluster Membership</th><th>Sum of Squared Memberships</th><th>Bar of Squared Memberships</th><th>Silhouette Amount</th><th>Silhouette Bar</th></tr>
<tr><td>24 137</td><td>1</td><td>0.7975</td><td>0.6482</td><td>||||||||||||||||||||</td><td>0.5533</td><td>||||||||||||||||||</td></tr>
<tr><td>64 162</td><td>1</td><td>0.7688</td><td>0.6055</td><td>|||||||||||||||||||</td><td>0.5320</td><td>|||||||||||||||||</td></tr>
<tr><td>32 164</td><td>1</td><td>0.7657</td><td>0.6031</td><td>|||||||||||||||||||</td><td>0.4316</td><td>||||||||||||||</td></tr>
<tr><td>155 68</td><td>1</td><td>0.7422</td><td>0.5787</td><td>||||||||||||||||||</td><td>0.4723</td><td>|||||||||||||||</td></tr>
<tr><td>37 117</td><td>1</td><td>0.7354</td><td>0.5639</td><td>||||||||||||||||||</td><td>0.3353</td><td>|||||||||||</td></tr>
<tr><td>93 49</td><td>1</td><td>0.7170</td><td>0.5348</td><td>|||||||||||||||||</td><td>0.5143</td><td>||||||||||||||||</td></tr>
<tr><td>161 99</td><td>1</td><td>0.7094</td><td>0.5352</td><td>|||||||||||||||||</td><td>0.4715</td><td>|||||||||||||||</td></tr>
<tr><td>28 107</td><td>1</td><td>0.6905</td><td>0.5173</td><td>|||||||||||||||||</td><td>0.4438</td><td>||||||||||||||</td></tr>
<tr><td>163 116</td><td>1</td><td>0.6322</td><td>0.4469</td><td>||||||||||||||</td><td>0.2462</td><td>||||||||</td></tr>
<tr><td>14 41</td><td>1</td><td>0.6250</td><td>0.4455</td><td>||||||||||||||</td><td>0.4252</td><td>||||||||||||||</td></tr>
<tr><td>167 115</td><td>1</td><td>0.6229</td><td>0.4521</td><td>|||||||||||||||</td><td>0.3916</td><td>|||||||||||||</td></tr>
<tr><td>5 10</td><td>1</td><td>0.6070</td><td>0.4191</td><td>||||||||||||||</td><td>0.2911</td><td>||||||||||</td></tr>
<tr><td>2 172</td><td>1</td><td>0.5959</td><td>0.3959</td><td>|||||||||||||</td><td>0.4994</td><td>||||||||||||||||</td></tr>
<tr><td>43 62</td><td>1</td><td>0.5886</td><td>0.4029</td><td>|||||||||||||</td><td>0.2931</td><td>||||||||||</td></tr>
<tr><td>67 75</td><td>1</td><td>0.5600</td><td>0.3754</td><td>||||||||||||</td><td>0.2794</td><td>|||||||||</td></tr>
<tr><td>69 2</td><td>1</td><td>0.5503</td><td>0.3966</td><td>|||||||||||||</td><td>0.3187</td><td>|||||||||||</td></tr>
<tr><td>120 123</td><td>1</td><td>0.5384</td><td>0.3452</td><td>|||||||||||</td><td>0.3721</td><td>||||||||||||</td></tr>
<tr><td>68 15</td><td>1</td><td>0.5298</td><td>0.3431</td><td>|||||||||||</td><td>0.3806</td><td>||||||||||||</td></tr>
<tr><td>92 113</td><td>1</td><td>0.5223</td><td>0.3774</td><td>||||||||||||</td><td>0.0690</td><td>|||</td></tr>
<tr><td>137 42</td><td>1</td><td>0.5088</td><td>0.3446</td><td>|||||||||||</td><td>0.1160</td><td>||||</td></tr>
<tr><td>44 132</td><td>1</td><td>0.4531</td><td>0.3018</td><td>||||||||||</td><td>0.0878</td><td>||||</td></tr>
<tr><td>135 29</td><td>1</td><td>0.4344</td><td>0.2698</td><td>|||||||||</td><td>0.2753</td><td>|||||||||</td></tr>
<tr><td>106 37</td><td>1</td><td>0.3891</td><td>0.2806</td><td>|||||||||</td><td>0.1507</td><td>||||||</td></tr>
<tr><td>89 40</td><td>1</td><td>0.3773</td><td>0.2654</td><td>|||||||||</td><td>-0.0033</td><td>|</td></tr>
<tr><td>136 80</td><td>1</td><td>0.3747</td><td>0.2600</td><td>|||||||||</td><td>0.2655</td><td>|||||||||</td></tr>
<tr><td>117 149</td><td>2</td><td>0.8568</td><td>0.7417</td><td>|||||||||||||||||||||||</td><td>0.5514</td><td>||||||||||||||||||</td></tr>
<tr><td>168 73</td><td>2</td><td>0.8365</td><td>0.7082</td><td>||||||||||||||||||||||</td><td>0.6256</td><td>||||||||||||||||||||</td></tr>
<tr><td>144 126</td><td>2</td><td>0.8266</td><td>0.6949</td><td>||||||||||||||||||||||</td><td>0.5943</td><td>|||||||||||||||||||</td></tr>
</table>

**Membership Summary Section for Clusters = 7**

| Row | Cluster | Cluster Membership | Sum of Squared Memberships | Bar of Squared Memberships | Silhouette Amount | Silhouette Bar |
|---|---|---|---|---|---|---|
| 26 98 | 2 | 0.8208 | 0.6888 | \|IIIIIIIIIIIIIIIIIIIII | 0.5530 | \|IIIIIIIIIIIIIIIII |
| 22 34 | 2 | 0.8115 | 0.6720 | \|IIIIIIIIIIIIIIIIIIII | 0.5080 | \|IIIIIIIIIIIIIII |
| 15 58 | 2 | 0.8107 | 0.6704 | \|IIIIIIIIIIIIIIIIIIII | 0.5886 | \|IIIIIIIIIIIIIIIIII |
| 61 95 | 2 | 0.8061 | 0.6622 | \|IIIIIIIIIIIIIIIIIIII | 0.5359 | \|IIIIIIIIIIIIIIII |
| 126 55 | 2 | 0.7990 | 0.6520 | \|IIIIIIIIIIIIIIIIIIII | 0.4989 | \|IIIIIIIIIIIIIII |
| 52 17 | 2 | 0.7988 | 0.6505 | \|IIIIIIIIIIIIIIIIIIII | 0.6132 | \|IIIIIIIIIIIIIIIIII |
| 88 54 | 2 | 0.7955 | 0.6475 | \|IIIIIIIIIIIIIIIIIII | 0.5896 | \|IIIIIIIIIIIIIIIIII |
| 35 8 | 2 | 0.7922 | 0.6423 | \|IIIIIIIIIIIIIIIIIII | 0.5149 | \|IIIIIIIIIIIIIII |
| 73 140 | 2 | 0.7787 | 0.6249 | \|IIIIIIIIIIIIIIIIIII | 0.4729 | \|IIIIIIIIIIIIII |
| 39 151 | 2 | 0.7479 | 0.5826 | \|IIIIIIIIIIIIIIIII | 0.4548 | \|IIIIIIIIIIIIII |
| 172 150 | 2 | 0.7385 | 0.5648 | \|IIIIIIIIIIIIIIIII | 0.5428 | \|IIIIIIIIIIIIIIII |
| 40 33 | 2 | 0.7212 | 0.5593 | \|IIIIIIIIIIIIIIIII | 0.4779 | \|IIIIIIIIIIIIII |
| 142 46 | 2 | 0.6745 | 0.5032 | \|IIIIIIIIIIIIIII | 0.4537 | \|IIIIIIIIIIIIII |
| 62 12 | 2 | 0.6684 | 0.4892 | \|IIIIIIIIIIIIIII | 0.3306 | \|IIIIIIIIII |
| 82 81 | 2 | 0.6594 | 0.4857 | \|IIIIIIIIIIIIIII | 0.4444 | \|IIIIIIIIIIIII |
| 76 147 | 2 | 0.6590 | 0.4758 | \|IIIIIIIIIIIIII | 0.4256 | \|IIIIIIIIIIIII |
| 121 83 | 2 | 0.6087 | 0.4461 | \|IIIIIIIIIIIII | 0.4137 | \|IIIIIIIIIIII |
| 165 135 | 2 | 0.6005 | 0.4234 | \|IIIIIIIIIIIII | 0.2546 | \|IIIIIIII |
| 158 79 | 2 | 0.5837 | 0.4445 | \|IIIIIIIIIIIII | 0.3767 | \|IIIIIIIIIII |
| 118 103 | 2 | 0.5823 | 0.4088 | \|IIIIIIIIIIII | 0.3258 | \|IIIIIIIIII |
| 103 112 | 2 | 0.5074 | 0.3349 | \|IIIIIIIIII | 0.3480 | \|IIIIIIIIII |
| 25 4 | 2 | 0.4941 | 0.3648 | \|IIIIIIIIIII | 0.1993 | \|IIIIII |
| 97 139 | 2 | 0.4863 | 0.3346 | \|IIIIIIIIII | 0.2369 | \|IIIIIII |
| 143 114 | 2 | 0.4806 | 0.3313 | \|IIIIIIIIII | 0.2841 | \|IIIIIIIII |
| 9 96 | 2 | 0.4626 | 0.3324 | \|IIIIIIIIII | 0.2163 | \|IIIIII |
| 171 100 | 3 | 0.8297 | 0.6979 | \|IIIIIIIIIIIIIIIIIIIII | 0.3636 | \|IIIIIIIIIII |
| 85 47 | 3 | 0.7954 | 0.6506 | \|IIIIIIIIIIIIIIIIIIII | 0.2273 | \|IIIIIII |
| 10 13 | 3 | 0.7689 | 0.6104 | \|IIIIIIIIIIIIIIIIII | 0.2898 | \|IIIIIIIII |
| 27 143 | 3 | 0.7636 | 0.5998 | \|IIIIIIIIIIIIIIIIII | 0.3826 | \|IIIIIIIIIII |
| 87 44 | 3 | 0.7611 | 0.5953 | \|IIIIIIIIIIIIIIIIII | 0.3979 | \|IIIIIIIIIIII |
| 19 14 | 3 | 0.7498 | 0.5925 | \|IIIIIIIIIIIIIIIIII | 0.1306 | \|IIII |
| 23 72 | 3 | 0.7423 | 0.5694 | \|IIIIIIIIIIIIIIIII | 0.3859 | \|IIIIIIIIIIII |
| 148 18 | 3 | 0.7359 | 0.5766 | \|IIIIIIIIIIIIIIIII | 0.1101 | \|III |
| 71 51 | 3 | 0.7038 | 0.5228 | \|IIIIIIIIIIIIIIII | 0.2798 | \|IIIIIIII |
| 104 56 | 3 | 0.6765 | 0.4847 | \|IIIIIIIIIIIIIII | 0.3473 | \|IIIIIIIIII |
| 156 87 | 3 | 0.6724 | 0.4902 | \|IIIIIIIIIIIIIII | 0.1624 | \|IIIII |
| 108 93 | 3 | 0.6523 | 0.4781 | \|IIIIIIIIIIIIII | 0.0579 | \|II |
| 105 7 | 3 | 0.5983 | 0.4566 | \|IIIIIIIIIIIIII | -0.1282 | \| |
| 107 1 | 3 | 0.5775 | 0.4340 | \|IIIIIIIIIIIII | -0.0770 | \| |
| 66 158 | 3 | 0.5434 | 0.4156 | \|IIIIIIIIIIII | -0.1321 | \| |
| 114 9 | 3 | 0.4940 | 0.3475 | \|IIIIIIIIII | -0.0849 | \| |
| 83 161 | 3 | 0.4525 | 0.2680 | \|IIIIIIII | 0.3110 | \|IIIIIIIII |

**Membership Summary Section for Clusters = 7**

<table>
<tr><th>Row</th><th>Cluster</th><th>Cluster Membership</th><th>Sum of Squared Memberships</th><th>Bar of Squared Memberships</th><th>Silhouette Amount</th><th>Silhouette Bar</th></tr>
<tr><td>41 11</td><td>3</td><td>0.4391</td><td>0.2670</td><td>|IIIIIIII</td><td>0.2248</td><td>|IIIIIII</td></tr>
<tr><td>113 141</td><td>3</td><td>0.4306</td><td>0.2653</td><td>|IIIIIIII</td><td>0.1986</td><td>|IIIIII</td></tr>
<tr><td>166 24</td><td>3</td><td>0.4137</td><td>0.3239</td><td>|IIIIIIIIII</td><td>-0.2228</td><td>|</td></tr>
<tr><td>53 111</td><td>3</td><td>0.3868</td><td>0.2685</td><td>|IIIIIIII</td><td>-0.0579</td><td>|</td></tr>
<tr><td>99 91</td><td>3</td><td>0.3407</td><td>0.2213</td><td>|IIIIIII</td><td>0.1779</td><td>|IIIII</td></tr>
<tr><td>164 146</td><td>3</td><td>0.2423</td><td>0.1941</td><td>|IIIIII</td><td>-0.0457</td><td>|</td></tr>
<tr><td>123 153</td><td>4</td><td>0.9212</td><td>0.8498</td><td>|IIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.7003</td><td>|IIIIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>20 6</td><td>4</td><td>0.9194</td><td>0.8469</td><td>|IIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.6925</td><td>|IIIIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>130 26</td><td>4</td><td>0.9182</td><td>0.8447</td><td>|IIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.6904</td><td>|IIIIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>11 90</td><td>4</td><td>0.9142</td><td>0.8375</td><td>|IIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.6921</td><td>|IIIIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>98 121</td><td>4</td><td>0.9038</td><td>0.8193</td><td>|IIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.6987</td><td>|IIIIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>33 31</td><td>4</td><td>0.8986</td><td>0.8100</td><td>|IIIIIIIIIIIIIIIIIIIIIIII</td><td>0.6812</td><td>|IIIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>128 76</td><td>4</td><td>0.8855</td><td>0.7866</td><td>|IIIIIIIIIIIIIIIIIIIIIIII</td><td>0.6841</td><td>|IIIIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>96 64</td><td>4</td><td>0.8826</td><td>0.7836</td><td>|IIIIIIIIIIIIIIIIIIIIIIII</td><td>0.6629</td><td>|IIIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>45 152</td><td>4</td><td>0.8764</td><td>0.7710</td><td>|IIIIIIIIIIIIIIIIIIIIIII</td><td>0.6565</td><td>|IIIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>139 85</td><td>4</td><td>0.8507</td><td>0.7294</td><td>|IIIIIIIIIIIIIIIIIIIIII</td><td>0.6767</td><td>|IIIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>51 148</td><td>4</td><td>0.8418</td><td>0.7178</td><td>|IIIIIIIIIIIIIIIIIIIIII</td><td>0.6352</td><td>|IIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>80 21</td><td>4</td><td>0.8280</td><td>0.6915</td><td>|IIIIIIIIIIIIIIIIIIIII</td><td>0.6297</td><td>|IIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>60 133</td><td>4</td><td>0.8212</td><td>0.6852</td><td>|IIIIIIIIIIIIIIIIIIIII</td><td>0.6239</td><td>|IIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>86 122</td><td>4</td><td>0.8123</td><td>0.6663</td><td>|IIIIIIIIIIIIIIIIIIII</td><td>0.6185</td><td>|IIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>79 138</td><td>4</td><td>0.8109</td><td>0.6640</td><td>|IIIIIIIIIIIIIIIIIIII</td><td>0.6148</td><td>|IIIIIIIIIIIIIIIIII</td></tr>
<tr><td>78 104</td><td>4</td><td>0.8101</td><td>0.6642</td><td>|IIIIIIIIIIIIIIIIIIII</td><td>0.6252</td><td>|IIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>116 167</td><td>4</td><td>0.8101</td><td>0.6699</td><td>|IIIIIIIIIIIIIIIIIIII</td><td>0.6198</td><td>|IIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>84 170</td><td>4</td><td>0.8096</td><td>0.6619</td><td>|IIIIIIIIIIIIIIIIIIII</td><td>0.6279</td><td>|IIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>16 155</td><td>4</td><td>0.7892</td><td>0.6307</td><td>|IIIIIIIIIIIIIIIIIII</td><td>0.6241</td><td>|IIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>6 110</td><td>4</td><td>0.7633</td><td>0.5976</td><td>|IIIIIIIIIIIIIIIIII</td><td>0.6257</td><td>|IIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>57 67</td><td>4</td><td>0.7589</td><td>0.5864</td><td>|IIIIIIIIIIIIIIIIII</td><td>0.5925</td><td>|IIIIIIIIIIIIIIIIII</td></tr>
<tr><td>150 125</td><td>4</td><td>0.7270</td><td>0.5418</td><td>|IIIIIIIIIIIIIIII</td><td>0.5721</td><td>|IIIIIIIIIIIIIIIII</td></tr>
<tr><td>141 71</td><td>4</td><td>0.7188</td><td>0.5306</td><td>|IIIIIIIIIIIIIIII</td><td>0.5972</td><td>|IIIIIIIIIIIIIIIIII</td></tr>
<tr><td>56 53</td><td>4</td><td>0.6924</td><td>0.5044</td><td>|IIIIIIIIIIIIIII</td><td>0.5922</td><td>|IIIIIIIIIIIIIIIIII</td></tr>
<tr><td>50 136</td><td>4</td><td>0.6814</td><td>0.4829</td><td>|IIIIIIIIIIIIII</td><td>0.6184</td><td>|IIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>91 154</td><td>4</td><td>0.6696</td><td>0.4925</td><td>|IIIIIIIIIIIIIII</td><td>0.5475</td><td>|IIIIIIIIIIIIIIII</td></tr>
<tr><td>131 19</td><td>4</td><td>0.6492</td><td>0.4689</td><td>|IIIIIIIIIIIIII</td><td>0.5322</td><td>|IIIIIIIIIIIIIIII</td></tr>
<tr><td>102 32</td><td>4</td><td>0.6396</td><td>0.4627</td><td>|IIIIIIIIIIIIII</td><td>0.5290</td><td>|IIIIIIIIIIIIIIII</td></tr>
<tr><td>3 101</td><td>4</td><td>0.6367</td><td>0.4332</td><td>|IIIIIIIIIIIII</td><td>0.5980</td><td>|IIIIIIIIIIIIIIIIII</td></tr>
<tr><td>111 50</td><td>4</td><td>0.6324</td><td>0.4241</td><td>|IIIIIIIIIIIII</td><td>0.5191</td><td>|IIIIIIIIIIIIIIII</td></tr>
<tr><td>127 159</td><td>4</td><td>0.6145</td><td>0.4382</td><td>|IIIIIIIIIIIII</td><td>0.5058</td><td>|IIIIIIIIIIIIIII</td></tr>
<tr><td>169 118</td><td>4</td><td>0.6141</td><td>0.4511</td><td>|IIIIIIIIIIIIII</td><td>0.5050</td><td>|IIIIIIIIIIIIIII</td></tr>
<tr><td>160 70</td><td>4</td><td>0.5802</td><td>0.3682</td><td>|IIIIIIIIIII</td><td>0.4919</td><td>|IIIIIIIIIIIIIII</td></tr>
<tr><td>47 82</td><td>4</td><td>0.5046</td><td>0.3643</td><td>|IIIIIIIIIII</td><td>0.4358</td><td>|IIIIIIIIIIIII</td></tr>
<tr><td>95 35</td><td>4</td><td>0.4550</td><td>0.2617</td><td>|IIIIIIII</td><td>0.4098</td><td>|IIIIIIIIIIII</td></tr>
<tr><td>162 109</td><td>4</td><td>0.4402</td><td>0.3092</td><td>|IIIIIIIII</td><td>0.4037</td><td>|IIIIIIIIIIII</td></tr>
</table>

**Membership Summary Section for Clusters = 7**

<table>
<tr><th>Row</th><th>Cluster</th><th>Cluster Membership</th><th>Sum of Squared Memberships</th><th>Bar of Squared Memberships</th><th>Silhouette Amount</th><th>Silhouette Bar</th></tr>
<tr><td>74 131</td><td>4</td><td>0.3804</td><td>0.2128</td><td>|IIIIII</td><td>0.4102</td><td>|IIIIIIIIIIII</td></tr>
<tr><td>34 57</td><td>4</td><td>0.3620</td><td>0.2288</td><td>|IIIIIII</td><td>0.3677</td><td>|IIIIIIIIIII</td></tr>
<tr><td>1 63</td><td>5</td><td>0.8588</td><td>0.7409</td><td>|IIIIIIIIIIIIIIIIIIIIII</td><td>0.1674</td><td>|IIIII</td></tr>
<tr><td>140 142</td><td>5</td><td>0.8190</td><td>0.6764</td><td>|IIIIIIIIIIIIIIIIIIII</td><td>0.0584</td><td>|II</td></tr>
<tr><td>7 30</td><td>5</td><td>0.7649</td><td>0.5945</td><td>|IIIIIIIIIIIIIIIIII</td><td>0.2860</td><td>|IIIIIIIII</td></tr>
<tr><td>55 134</td><td>5</td><td>0.6846</td><td>0.4854</td><td>|IIIIIIIIIIIIIII</td><td>0.3494</td><td>|IIIIIIIIII</td></tr>
<tr><td>134 66</td><td>5</td><td>0.5967</td><td>0.3849</td><td>|IIIIIIIIIIII</td><td>0.1632</td><td>|IIIII</td></tr>
<tr><td>101 61</td><td>5</td><td>0.5298</td><td>0.3234</td><td>|IIIIIIIIII</td><td>-0.0715</td><td>|</td></tr>
<tr><td>70 36</td><td>5</td><td>0.5292</td><td>0.3193</td><td>|IIIIIIIIII</td><td>-0.3011</td><td>|</td></tr>
<tr><td>100 157</td><td>5</td><td>0.4452</td><td>0.2503</td><td>|IIIIIIII</td><td>0.3107</td><td>|IIIIIIIII</td></tr>
<tr><td>58 88</td><td>5</td><td>0.4403</td><td>0.2533</td><td>|IIIIIIII</td><td>-0.2911</td><td>|</td></tr>
<tr><td>151 92</td><td>5</td><td>0.4330</td><td>0.2489</td><td>|IIIIIII</td><td>-0.0876</td><td>|</td></tr>
<tr><td>63 59</td><td>5</td><td>0.4330</td><td>0.2540</td><td>|IIIIIIII</td><td>-0.3987</td><td>|</td></tr>
<tr><td>65 130</td><td>5</td><td>0.4020</td><td>0.2461</td><td>|IIIIIII</td><td>-0.4187</td><td>|</td></tr>
<tr><td>112 27</td><td>5</td><td>0.2386</td><td>0.1538</td><td>|IIIII</td><td>0.1947</td><td>|IIIIII</td></tr>
<tr><td>36 108</td><td>6</td><td>0.8644</td><td>0.7515</td><td>|IIIIIIIIIIIIIIIIIIIIIII</td><td>0.2793</td><td>|IIIIIIII</td></tr>
<tr><td>81 156</td><td>6</td><td>0.8606</td><td>0.7458</td><td>|IIIIIIIIIIIIIIIIIIIIII</td><td>0.1371</td><td>|IIII</td></tr>
<tr><td>154 23</td><td>6</td><td>0.8189</td><td>0.6815</td><td>|IIIIIIIIIIIIIIIIIIII</td><td>0.0280</td><td>|I</td></tr>
<tr><td>31 102</td><td>6</td><td>0.8113</td><td>0.6660</td><td>|IIIIIIIIIIIIIIIIIIII</td><td>0.2884</td><td>|IIIIIIIII</td></tr>
<tr><td>90 43</td><td>6</td><td>0.8108</td><td>0.6655</td><td>|IIIIIIIIIIIIIIIIIIII</td><td>0.2898</td><td>|IIIIIIIII</td></tr>
<tr><td>122 94</td><td>6</td><td>0.7860</td><td>0.6303</td><td>|IIIIIIIIIIIIIIIIIII</td><td>0.0727</td><td>|II</td></tr>
<tr><td>138 89</td><td>6</td><td>0.7787</td><td>0.6164</td><td>|IIIIIIIIIIIIIIIIII</td><td>0.3672</td><td>|IIIIIIIIIII</td></tr>
<tr><td>94 69</td><td>6</td><td>0.6955</td><td>0.5020</td><td>|IIIIIIIIIIIIIII</td><td>0.3686</td><td>|IIIIIIIIIII</td></tr>
<tr><td>59 105</td><td>6</td><td>0.6662</td><td>0.4650</td><td>|IIIIIIIIIIIIII</td><td>0.3738</td><td>|IIIIIIIIIII</td></tr>
<tr><td>21 16</td><td>6</td><td>0.6611</td><td>0.4874</td><td>|IIIIIIIIIIIIIII</td><td>-0.2528</td><td>|</td></tr>
<tr><td>159 119</td><td>6</td><td>0.6449</td><td>0.4478</td><td>|IIIIIIIIIIIII</td><td>0.0007</td><td>|</td></tr>
<tr><td>4 120</td><td>6</td><td>0.6392</td><td>0.4474</td><td>|IIIIIIIIIIIII</td><td>-0.0686</td><td>|</td></tr>
<tr><td>145 165</td><td>6</td><td>0.5339</td><td>0.3313</td><td>|IIIIIIIIII</td><td>0.1328</td><td>|IIII</td></tr>
<tr><td>115 160</td><td>6</td><td>0.5194</td><td>0.3608</td><td>|IIIIIIIIIII</td><td>-0.2855</td><td>|</td></tr>
<tr><td>125 144</td><td>6</td><td>0.5023</td><td>0.2980</td><td>|IIIIIIIII</td><td>0.3387</td><td>|IIIIIIIIII</td></tr>
<tr><td>29 128</td><td>6</td><td>0.4948</td><td>0.2950</td><td>|IIIIIIIII</td><td>0.2187</td><td>|IIIIIII</td></tr>
<tr><td>129 127</td><td>6</td><td>0.4604</td><td>0.3309</td><td>|IIIIIIIIII</td><td>-0.3310</td><td>|</td></tr>
<tr><td>18 166</td><td>6</td><td>0.4131</td><td>0.2802</td><td>|IIIIIIII</td><td>-0.2970</td><td>|</td></tr>
<tr><td>149 48</td><td>6</td><td>0.3954</td><td>0.2228</td><td>|IIIIIII</td><td>0.2607</td><td>|IIIIIIII</td></tr>
<tr><td>133 74</td><td>6</td><td>0.2812</td><td>0.1688</td><td>|IIIII</td><td>0.1832</td><td>|IIIII</td></tr>
<tr><td>152 78</td><td>6</td><td>0.2715</td><td>0.1762</td><td>|IIIII</td><td>-0.0718</td><td>|</td></tr>
<tr><td>157 77</td><td>6</td><td>0.2685</td><td>0.1931</td><td>|IIIIII</td><td>-0.2248</td><td>|</td></tr>
<tr><td>147 60</td><td>7</td><td>0.8635</td><td>0.7525</td><td>|IIIIIIIIIIIIIIIIIIIIIII</td><td>0.2816</td><td>|IIIIIIII</td></tr>
<tr><td>30 5</td><td>7</td><td>0.8531</td><td>0.7341</td><td>|IIIIIIIIIIIIIIIIIIIIII</td><td>0.3504</td><td>|IIIIIIIIIII</td></tr>
<tr><td>119 3</td><td>7</td><td>0.8530</td><td>0.7363</td><td>|IIIIIIIIIIIIIIIIIIIIII</td><td>0.2250</td><td>|IIIIIII</td></tr>
<tr><td>42 168</td><td>7</td><td>0.8074</td><td>0.6650</td><td>|IIIIIIIIIIIIIIIIIIII</td><td>0.3068</td><td>|IIIIIIIII</td></tr>
<tr><td>17 163</td><td>7</td><td>0.7911</td><td>0.6372</td><td>|IIIIIIIIIIIIIIIIIII</td><td>0.3559</td><td>|IIIIIIIIIII</td></tr>
</table>

**Membership Summary Section for Clusters = 7**

| Row | Cluster | Cluster Membership | Sum of Squared Memberships | Bar of Squared Memberships | Silhouette Amount | Silhouette Bar |
|---|---|---|---|---|---|---|
| 13 169 | 7 | 0.7723 | 0.6188 | \|IIIIIIIIIIIIIIIIIII | 0.1985 | \|IIIIII |
| 54 86 | 7 | 0.7675 | 0.6043 | \|IIIIIIIIIIIIIIIIII | 0.2770 | \|IIIIIIII |
| 75 25 | 7 | 0.7148 | 0.5400 | \|IIIIIIIIIIIIIIII | 0.1850 | \|IIIIII |
| 170 97 | 7 | 0.6910 | 0.5024 | \|IIIIIIIIIIIIIII | 0.2217 | \|IIIIIII |
| 109 22 | 7 | 0.6906 | 0.5162 | \|IIIIIIIIIIIIIII | 0.0298 | \|I |
| 146 38 | 7 | 0.6872 | 0.5281 | \|IIIIIIIIIIIIIIII | -0.0960 | \| |
| 48 171 | 7 | 0.6627 | 0.5045 | \|IIIIIIIIIIIIIII | -0.0850 | \| |
| 110 65 | 7 | 0.6112 | 0.4159 | \|IIIIIIIIIIII | 0.1237 | \|IIII |
| 153 45 | 7 | 0.5972 | 0.3998 | \|IIIIIIIIIIII | 0.2930 | \|IIIIIIIII |
| 38 39 | 7 | 0.5446 | 0.3485 | \|IIIIIIIIII | 0.0951 | \|III |
| 124 28 | 7 | 0.5240 | 0.3183 | \|IIIIIIIIII | 0.2795 | \|IIIIIIII |
| 12 145 | 7 | 0.5206 | 0.3746 | \|IIIIIIIIIII | -0.0023 | \| |
| 46 129 | 7 | 0.5204 | 0.3531 | \|IIIIIIIIIII | 0.1097 | \|III |
| 8 20 | 7 | 0.5076 | 0.3828 | \|IIIIIIIIIII | -0.1771 | \| |
| 77 84 | 7 | 0.4728 | 0.2742 | \|IIIIIIII | 0.3414 | \|IIIIIIIIII |
| 72 52 | 7 | 0.4365 | 0.3150 | \|IIIIIIIII | -0.1893 | \| |
| 132 124 | 7 | 0.2913 | 0.1897 | \|IIIIII | 0.0976 | \|III |
| 49 106 | 7 | 0.2403 | 0.1697 | \|IIIII | 0.1042 | \|III |

**Membership Matrix Section**

| Row | Cluster | Prob in 1 | Prob in 2 | Prob in 3 | Prob in 4 | Prob in 5 | Prob in 6 |
|---|---|---|---|---|---|---|---|
| 1 63 | 5 | 0.0274 | 0.0183 | 0.0278 | 0.0211 | 0.8588 | 0.0205 |
| 2 172 | 1 | 0.5959 | 0.0869 | 0.1468 | 0.0293 | 0.0248 | 0.0162 |
| 3 101 | 4 | 0.0507 | 0.0371 | 0.0434 | 0.6367 | 0.0543 | 0.1295 |
| 4 120 | 6 | 0.0330 | 0.0320 | 0.0242 | 0.1782 | 0.0421 | 0.6392 |
| 5 10 | 1 | 0.6070 | 0.1348 | 0.1720 | 0.0184 | 0.0093 | 0.0099 |
| 6 110 | 4 | 0.0291 | 0.0235 | 0.0208 | 0.7633 | 0.0218 | 0.1075 |
| 7 30 | 5 | 0.0438 | 0.0327 | 0.0444 | 0.0336 | 0.7649 | 0.0361 |
| 8 20 | 7 | 0.0933 | 0.3397 | 0.0267 | 0.0124 | 0.0088 | 0.0116 |
| 9 96 | 2 | 0.3202 | 0.4626 | 0.0911 | 0.0196 | 0.0100 | 0.0128 |
| 10 13 | 3 | 0.1281 | 0.0394 | 0.7689 | 0.0174 | 0.0125 | 0.0090 |
| 11 90 | 4 | 0.0128 | 0.0115 | 0.0089 | 0.9142 | 0.0055 | 0.0334 |
| 12 145 | 7 | 0.0682 | 0.3101 | 0.0292 | 0.0255 | 0.0138 | 0.0326 |
| 13 169 | 7 | 0.0365 | 0.1425 | 0.0138 | 0.0127 | 0.0068 | 0.0154 |
| 14 41 | 1 | 0.6250 | 0.0569 | 0.2197 | 0.0202 | 0.0171 | 0.0104 |
| 15 58 | 2 | 0.0478 | 0.8107 | 0.0171 | 0.0094 | 0.0046 | 0.0085 |
| 16 155 | 4 | 0.0432 | 0.0287 | 0.0369 | 0.7892 | 0.0220 | 0.0483 |
| 17 163 | 7 | 0.0545 | 0.0841 | 0.0201 | 0.0176 | 0.0128 | 0.0197 |
| 18 166 | 6 | 0.0523 | 0.0455 | 0.0382 | 0.3042 | 0.0723 | 0.4131 |
| 19 14 | 3 | 0.1691 | 0.0277 | 0.7498 | 0.0129 | 0.0125 | 0.0065 |
| 20 6 | 4 | 0.0121 | 0.0108 | 0.0083 | 0.9194 | 0.0052 | 0.0312 |
| 21 16 | 6 | 0.0237 | 0.0260 | 0.0157 | 0.2165 | 0.0165 | 0.6611 |
| 22 34 | 2 | 0.0683 | 0.8115 | 0.0143 | 0.0060 | 0.0031 | 0.0046 |
| 23 72 | 3 | 0.1186 | 0.0440 | 0.7423 | 0.0259 | 0.0236 | 0.0137 |
| 24 137 | 1 | 0.7975 | 0.0514 | 0.0893 | 0.0101 | 0.0076 | 0.0057 |
| 25 4 | 2 | 0.3320 | 0.4941 | 0.0640 | 0.0156 | 0.0074 | 0.0098 |
| 26 98 | 2 | 0.0377 | 0.8208 | 0.0110 | 0.0062 | 0.0030 | 0.0054 |
| 27 143 | 3 | 0.1162 | 0.0350 | 0.7636 | 0.0196 | 0.0264 | 0.0109 |
| 28 107 | 1 | 0.6905 | 0.0598 | 0.1887 | 0.0138 | 0.0078 | 0.0068 |
| 29 128 | 6 | 0.0574 | 0.0561 | 0.0460 | 0.1441 | 0.1174 | 0.4948 |
| 30 5 | 7 | 0.0321 | 0.0696 | 0.0118 | 0.0123 | 0.0069 | 0.0144 |
| 31 102 | 6 | 0.0218 | 0.0294 | 0.0144 | 0.0633 | 0.0148 | 0.8113 |
| 32 164 | 1 | 0.7657 | 0.0867 | 0.0863 | 0.0088 | 0.0063 | 0.0054 |
| 33 31 | 4 | 0.0142 | 0.0130 | 0.0094 | 0.8986 | 0.0062 | 0.0424 |
| 34 57 | 4 | 0.0686 | 0.0527 | 0.0569 | 0.3620 | 0.1288 | 0.2540 |
| 35 8 | 2 | 0.1014 | 0.7922 | 0.0264 | 0.0089 | 0.0043 | 0.0064 |
| 36 108 | 6 | 0.0150 | 0.0193 | 0.0100 | 0.0503 | 0.0109 | 0.8644 |
| 37 117 | 1 | 0.7354 | 0.1248 | 0.0731 | 0.0106 | 0.0058 | 0.0061 |
| 38 39 | 7 | 0.1664 | 0.1336 | 0.0550 | 0.0368 | 0.0317 | 0.0320 |
| 39 151 | 2 | 0.1340 | 0.7479 | 0.0306 | 0.0104 | 0.0047 | 0.0070 |
| 40 33 | 2 | 0.0473 | 0.7212 | 0.0153 | 0.0107 | 0.0047 | 0.0099 |
| 41 11 | 3 | 0.1983 | 0.0661 | 0.4391 | 0.0476 | 0.1502 | 0.0288 |
| 42 168 | 7 | 0.0388 | 0.1045 | 0.0150 | 0.0118 | 0.0082 | 0.0143 |
| 43 62 | 1 | 0.5886 | 0.1374 | 0.1861 | 0.0188 | 0.0096 | 0.0102 |
| 44 132 | 1 | 0.4531 | 0.2331 | 0.1903 | 0.0253 | 0.0129 | 0.0148 |

**Membership Matrix Section**

| Row | Cluster | Prob in 1 | Prob in 2 | Prob in 3 | Prob in 4 | Prob in 5 | Prob in 6 |
|---|---|---|---|---|---|---|---|
| 45 152 | 4 | 0.0227 | 0.0190 | 0.0164 | 0.8764 | 0.0086 | 0.0364 |
| 46 129 | 7 | 0.0767 | 0.2674 | 0.0358 | 0.0334 | 0.0193 | 0.0472 |
| 47 82 | 4 | 0.0368 | 0.0417 | 0.0239 | 0.5046 | 0.0177 | 0.3205 |
| 48 171 | 7 | 0.0432 | 0.2508 | 0.0142 | 0.0117 | 0.0056 | 0.0119 |
| 49 106 | 7 | 0.1172 | 0.1908 | 0.0817 | 0.1009 | 0.0684 | 0.2009 |
| 50 136 | 4 | 0.0545 | 0.0384 | 0.0501 | 0.6814 | 0.0422 | 0.0893 |
| 51 148 | 4 | 0.0152 | 0.0139 | 0.0106 | 0.8418 | 0.0093 | 0.0903 |
| 52 17 | 2 | 0.0623 | 0.7988 | 0.0232 | 0.0120 | 0.0055 | 0.0101 |
| 53 111 | 3 | 0.3120 | 0.0792 | 0.3868 | 0.0350 | 0.0790 | 0.0227 |
| 54 86 | 7 | 0.0477 | 0.1056 | 0.0178 | 0.0238 | 0.0100 | 0.0275 |
| 55 134 | 5 | 0.0534 | 0.0420 | 0.0523 | 0.0515 | 0.6846 | 0.0598 |
| 56 53 | 4 | 0.0381 | 0.0303 | 0.0265 | 0.6924 | 0.0296 | 0.1376 |
| 57 67 | 4 | 0.0510 | 0.0382 | 0.0418 | 0.7589 | 0.0189 | 0.0534 |
| 58 88 | 5 | 0.0769 | 0.0537 | 0.0712 | 0.1497 | 0.4403 | 0.1311 |
| 59 105 | 6 | 0.0403 | 0.0447 | 0.0298 | 0.0934 | 0.0552 | 0.6662 |
| 60 133 | 4 | 0.0185 | 0.0182 | 0.0127 | 0.8212 | 0.0094 | 0.0970 |
| 61 95 | 2 | 0.0889 | 0.8061 | 0.0251 | 0.0087 | 0.0043 | 0.0064 |
| 62 12 | 2 | 0.1711 | 0.6684 | 0.0283 | 0.0098 | 0.0050 | 0.0069 |
| 63 59 | 5 | 0.1509 | 0.0647 | 0.1629 | 0.0585 | 0.4330 | 0.0408 |
| 64 162 | 1 | 0.7688 | 0.0647 | 0.0833 | 0.0121 | 0.0095 | 0.0071 |
| 65 130 | 5 | 0.1393 | 0.0629 | 0.2258 | 0.0589 | 0.4020 | 0.0391 |
| 66 158 | 3 | 0.3418 | 0.0413 | 0.5434 | 0.0154 | 0.0166 | 0.0083 |
| 67 75 | 1 | 0.5600 | 0.1950 | 0.0755 | 0.0148 | 0.0117 | 0.0103 |
| 68 15 | 1 | 0.5298 | 0.1395 | 0.0831 | 0.0258 | 0.0191 | 0.0165 |
| 69 2 | 1 | 0.5503 | 0.0573 | 0.2953 | 0.0174 | 0.0197 | 0.0101 |
| 70 36 | 5 | 0.1066 | 0.0547 | 0.0965 | 0.0755 | 0.5292 | 0.0541 |
| 71 51 | 3 | 0.1477 | 0.0564 | 0.7038 | 0.0258 | 0.0179 | 0.0135 |
| 72 52 | 7 | 0.1942 | 0.2911 | 0.0383 | 0.0162 | 0.0108 | 0.0128 |
| 73 140 | 2 | 0.0820 | 0.7787 | 0.0167 | 0.0068 | 0.0036 | 0.0051 |
| 74 131 | 4 | 0.1090 | 0.0640 | 0.1073 | 0.3804 | 0.1470 | 0.1126 |
| 75 25 | 7 | 0.0699 | 0.1523 | 0.0238 | 0.0137 | 0.0112 | 0.0144 |
| 76 147 | 2 | 0.1159 | 0.6590 | 0.0268 | 0.0164 | 0.0062 | 0.0114 |
| 77 84 | 7 | 0.1015 | 0.1209 | 0.0511 | 0.0721 | 0.0644 | 0.1172 |
| 78 104 | 4 | 0.0300 | 0.0288 | 0.0206 | 0.8101 | 0.0113 | 0.0674 |
| 79 138 | 4 | 0.0397 | 0.0263 | 0.0309 | 0.8109 | 0.0183 | 0.0435 |
| 80 21 | 4 | 0.0308 | 0.0274 | 0.0220 | 0.8280 | 0.0112 | 0.0517 |
| 81 156 | 6 | 0.0141 | 0.0175 | 0.0091 | 0.0610 | 0.0097 | 0.8606 |
| 82 81 | 2 | 0.0800 | 0.6594 | 0.0246 | 0.0106 | 0.0067 | 0.0096 |
| 83 161 | 3 | 0.1688 | 0.0716 | 0.4525 | 0.0621 | 0.1408 | 0.0362 |
| 84 170 | 4 | 0.0395 | 0.0282 | 0.0328 | 0.8096 | 0.0167 | 0.0439 |
| 85 47 | 3 | 0.1280 | 0.0313 | 0.7954 | 0.0107 | 0.0092 | 0.0059 |
| 86 122 | 4 | 0.0384 | 0.0297 | 0.0299 | 0.8123 | 0.0141 | 0.0452 |
| 87 44 | 3 | 0.1113 | 0.0363 | 0.7611 | 0.0235 | 0.0267 | 0.0123 |
| 88 54 | 2 | 0.0532 | 0.7955 | 0.0199 | 0.0108 | 0.0053 | 0.0097 |

**Membership Matrix Section**

| Row | Cluster | Prob in 1 | Prob in 2 | Prob in 3 | Prob in 4 | Prob in 5 | Prob in 6 |
|---|---|---|---|---|---|---|---|
| 89 40 | 1 | 0.3773 | 0.2665 | 0.2090 | 0.0307 | 0.0158 | 0.0185 |
| 90 43 | 6 | 0.0207 | 0.0225 | 0.0148 | 0.0716 | 0.0238 | 0.8108 |
| 91 154 | 4 | 0.0275 | 0.0242 | 0.0199 | 0.6696 | 0.0229 | 0.2017 |
| 92 113 | 1 | 0.5223 | 0.3067 | 0.0595 | 0.0139 | 0.0071 | 0.0085 |
| 93 49 | 1 | 0.7170 | 0.0762 | 0.0949 | 0.0154 | 0.0134 | 0.0093 |
| 94 69 | 6 | 0.0363 | 0.0400 | 0.0271 | 0.0928 | 0.0473 | 0.6955 |
| 95 35 | 4 | 0.1245 | 0.0765 | 0.1361 | 0.4550 | 0.0551 | 0.0806 |
| 96 64 | 4 | 0.0127 | 0.0115 | 0.0087 | 0.8826 | 0.0072 | 0.0619 |
| 97 139 | 2 | 0.2844 | 0.4863 | 0.0939 | 0.0231 | 0.0106 | 0.0147 |
| 98 121 | 4 | 0.0126 | 0.0103 | 0.0091 | 0.9038 | 0.0079 | 0.0428 |
| 99 91 | 3 | 0.1962 | 0.0706 | 0.3407 | 0.0529 | 0.2271 | 0.0337 |
| 100 157 | 5 | 0.0894 | 0.0754 | 0.0881 | 0.0950 | 0.4452 | 0.1127 |
| 101 61 | 5 | 0.1010 | 0.0602 | 0.1373 | 0.0580 | 0.5298 | 0.0454 |
| 102 32 | 4 | 0.0296 | 0.0283 | 0.0191 | 0.6396 | 0.0182 | 0.2222 |
| 103 112 | 2 | 0.0995 | 0.5074 | 0.0486 | 0.0375 | 0.0175 | 0.0408 |
| 104 56 | 3 | 0.1391 | 0.0590 | 0.6765 | 0.0357 | 0.0293 | 0.0189 |
| 105 7 | 3 | 0.3103 | 0.0378 | 0.5983 | 0.0129 | 0.0098 | 0.0065 |
| 106 37 | 1 | 0.3891 | 0.2454 | 0.0656 | 0.0184 | 0.0148 | 0.0138 |
| 107 1 | 3 | 0.3118 | 0.0429 | 0.5775 | 0.0134 | 0.0150 | 0.0077 |
| 108 93 | 3 | 0.2180 | 0.0591 | 0.6523 | 0.0181 | 0.0116 | 0.0095 |
| 109 22 | 7 | 0.0801 | 0.1791 | 0.0207 | 0.0114 | 0.0077 | 0.0104 |
| 110 65 | 7 | 0.1416 | 0.1381 | 0.0386 | 0.0286 | 0.0183 | 0.0237 |
| 111 50 | 4 | 0.0831 | 0.0570 | 0.0756 | 0.6324 | 0.0309 | 0.0667 |
| 112 27 | 5 | 0.1293 | 0.1149 | 0.1358 | 0.1278 | 0.2386 | 0.1293 |
| 113 141 | 3 | 0.2213 | 0.0694 | 0.4306 | 0.0437 | 0.1348 | 0.0273 |
| 114 9 | 3 | 0.2982 | 0.1052 | 0.4940 | 0.0248 | 0.0151 | 0.0138 |
| 115 160 | 6 | 0.0384 | 0.0475 | 0.0247 | 0.2868 | 0.0190 | 0.5194 |
| 116 167 | 4 | 0.0176 | 0.0158 | 0.0123 | 0.8101 | 0.0117 | 0.1107 |
| 117 149 | 2 | 0.0513 | 0.8568 | 0.0117 | 0.0051 | 0.0025 | 0.0039 |
| 118 103 | 2 | 0.1453 | 0.5823 | 0.0268 | 0.0122 | 0.0062 | 0.0090 |
| 119 3 | 7 | 0.0274 | 0.0879 | 0.0092 | 0.0087 | 0.0044 | 0.0095 |
| 120 123 | 1 | 0.5384 | 0.1364 | 0.0873 | 0.0344 | 0.0196 | 0.0192 |
| 121 83 | 2 | 0.0900 | 0.6087 | 0.0196 | 0.0099 | 0.0051 | 0.0079 |
| 122 94 | 6 | 0.0217 | 0.0281 | 0.0141 | 0.0960 | 0.0130 | 0.7860 |
| 123 153 | 4 | 0.0130 | 0.0109 | 0.0095 | 0.9212 | 0.0058 | 0.0273 |
| 124 28 | 7 | 0.1267 | 0.1203 | 0.0539 | 0.0566 | 0.0546 | 0.0638 |
| 125 144 | 6 | 0.0666 | 0.0862 | 0.0484 | 0.1110 | 0.0616 | 0.5023 |
| 126 55 | 2 | 0.0943 | 0.7990 | 0.0230 | 0.0092 | 0.0039 | 0.0063 |
| 127 159 | 4 | 0.0324 | 0.0352 | 0.0213 | 0.6145 | 0.0156 | 0.2355 |
| 128 76 | 4 | 0.0212 | 0.0157 | 0.0168 | 0.8855 | 0.0105 | 0.0328 |
| 129 127 | 6 | 0.0421 | 0.0520 | 0.0268 | 0.3295 | 0.0198 | 0.4604 |
| 130 26 | 4 | 0.0121 | 0.0105 | 0.0081 | 0.9182 | 0.0055 | 0.0324 |
| 131 19 | 4 | 0.0310 | 0.0323 | 0.0194 | 0.6492 | 0.0152 | 0.2069 |
| 132 124 | 7 | 0.1126 | 0.2237 | 0.0710 | 0.0865 | 0.0504 | 0.1645 |

**Membership Matrix Section**

| Row | Cluster | Prob in 1 | Prob in 2 | Prob in 3 | Prob in 4 | Prob in 5 | Prob in 6 |
|---|---|---|---|---|---|---|---|
| 133 74 | 6 | 0.1064 | 0.1309 | 0.0859 | 0.1343 | 0.1017 | 0.2812 |
| 134 66 | 5 | 0.0832 | 0.0572 | 0.0949 | 0.0518 | 0.5967 | 0.0477 |
| 135 29 | 1 | 0.4344 | 0.0879 | 0.2331 | 0.0418 | 0.0671 | 0.0253 |
| 136 80 | 1 | 0.3747 | 0.1454 | 0.0890 | 0.0355 | 0.0340 | 0.0256 |
| 137 42 | 1 | 0.5088 | 0.2499 | 0.1356 | 0.0191 | 0.0099 | 0.0112 |
| 138 89 | 6 | 0.0267 | 0.0350 | 0.0180 | 0.0651 | 0.0212 | 0.7787 |
| 139 85 | 4 | 0.0194 | 0.0154 | 0.0146 | 0.8507 | 0.0142 | 0.0656 |
| 140 142 | 5 | 0.0375 | 0.0218 | 0.0376 | 0.0295 | 0.8190 | 0.0242 |
| 141 71 | 4 | 0.0556 | 0.0353 | 0.0473 | 0.7188 | 0.0357 | 0.0657 |
| 142 46 | 2 | 0.0583 | 0.6745 | 0.0223 | 0.0141 | 0.0072 | 0.0141 |
| 143 114 | 2 | 0.0904 | 0.4806 | 0.0427 | 0.0346 | 0.0166 | 0.0396 |
| 144 126 | 2 | 0.0410 | 0.8266 | 0.0144 | 0.0084 | 0.0039 | 0.0075 |
| 145 165 | 6 | 0.0509 | 0.0478 | 0.0393 | 0.1590 | 0.0963 | 0.5339 |
| 146 38 | 7 | 0.0460 | 0.2308 | 0.0133 | 0.0090 | 0.0049 | 0.0087 |
| 147 60 | 7 | 0.0300 | 0.0759 | 0.0099 | 0.0076 | 0.0050 | 0.0082 |
| 148 18 | 3 | 0.1826 | 0.0325 | 0.7359 | 0.0105 | 0.0107 | 0.0059 |
| 149 48 | 6 | 0.0848 | 0.1128 | 0.0635 | 0.1266 | 0.0697 | 0.3954 |
| 150 125 | 4 | 0.0599 | 0.0427 | 0.0508 | 0.7270 | 0.0223 | 0.0554 |
| 151 92 | 5 | 0.0742 | 0.0583 | 0.0674 | 0.1277 | 0.4330 | 0.1584 |
| 152 78 | 6 | 0.1009 | 0.1341 | 0.0699 | 0.1013 | 0.1008 | 0.2715 |
| 153 45 | 7 | 0.0721 | 0.1771 | 0.0342 | 0.0365 | 0.0237 | 0.0591 |
| 154 23 | 6 | 0.0160 | 0.0179 | 0.0110 | 0.0972 | 0.0125 | 0.8189 |
| 155 68 | 1 | 0.7422 | 0.0455 | 0.1567 | 0.0100 | 0.0085 | 0.0056 |
| 156 87 | 3 | 0.1780 | 0.0649 | 0.6724 | 0.0225 | 0.0146 | 0.0120 |
| 157 77 | 6 | 0.0754 | 0.0586 | 0.0610 | 0.2267 | 0.2211 | 0.2685 |
| 158 79 | 2 | 0.0561 | 0.5837 | 0.0163 | 0.0118 | 0.0052 | 0.0105 |
| 159 119 | 6 | 0.0383 | 0.0533 | 0.0244 | 0.1452 | 0.0196 | 0.6449 |
| 160 70 | 4 | 0.0966 | 0.0579 | 0.0937 | 0.5802 | 0.0440 | 0.0691 |
| 161 99 | 1 | 0.7094 | 0.0689 | 0.1599 | 0.0101 | 0.0082 | 0.0061 |
| 162 109 | 4 | 0.0476 | 0.0397 | 0.0342 | 0.4402 | 0.0551 | 0.3219 |
| 163 116 | 1 | 0.6322 | 0.1900 | 0.0832 | 0.0163 | 0.0076 | 0.0089 |
| 164 146 | 3 | 0.2377 | 0.0780 | 0.2423 | 0.0631 | 0.2392 | 0.0393 |
| 165 135 | 2 | 0.2108 | 0.6005 | 0.0329 | 0.0115 | 0.0060 | 0.0079 |
| 166 24 | 3 | 0.3681 | 0.1176 | 0.4137 | 0.0239 | 0.0136 | 0.0130 |
| 167 115 | 1 | 0.6229 | 0.0587 | 0.2422 | 0.0190 | 0.0109 | 0.0088 |
| 168 73 | 2 | 0.0507 | 0.8365 | 0.0184 | 0.0092 | 0.0042 | 0.0076 |
| 169 118 | 4 | 0.0255 | 0.0256 | 0.0169 | 0.6141 | 0.0154 | 0.2660 |
| 170 97 | 7 | 0.0656 | 0.1307 | 0.0237 | 0.0365 | 0.0133 | 0.0393 |
| 171 100 | 3 | 0.0888 | 0.0278 | 0.8297 | 0.0149 | 0.0122 | 0.0075 |
| 172 150 | 2 | 0.0971 | 0.7385 | 0.0386 | 0.0162 | 0.0074 | 0.0125 |

**Membership Matrix Section**

| Row | Cluster | Prob in 7 |
|---|---|---|
| 1 63 | 5 | 0.0263 |
| 2 172 | 1 | 0.1000 |
| 3 101 | 4 | 0.0484 |
| 4 120 | 6 | 0.0513 |
| 5 10 | 1 | 0.0487 |
| 6 110 | 4 | 0.0340 |
| 7 30 | 5 | 0.0445 |
| 8 20 | 7 | 0.5076 |
| 9 96 | 2 | 0.0836 |
| 10 13 | 3 | 0.0247 |
| 11 90 | 4 | 0.0137 |
| 12 145 | 7 | 0.5206 |
| 13 169 | 7 | 0.7723 |
| 14 41 | 1 | 0.0507 |
| 15 58 | 2 | 0.1019 |
| 16 155 | 4 | 0.0319 |
| 17 163 | 7 | 0.7911 |
| 18 166 | 6 | 0.0745 |
| 19 14 | 3 | 0.0213 |
| 20 6 | 4 | 0.0130 |
| 21 16 | 6 | 0.0405 |
| 22 34 | 2 | 0.0924 |
| 23 72 | 3 | 0.0319 |
| 24 137 | 1 | 0.0385 |
| 25 4 | 2 | 0.0770 |
| 26 98 | 2 | 0.1157 |
| 27 143 | 3 | 0.0283 |
| 28 107 | 1 | 0.0325 |
| 29 128 | 6 | 0.0841 |
| 30 5 | 7 | 0.8531 |
| 31 102 | 6 | 0.0449 |
| 32 164 | 1 | 0.0407 |
| 33 31 | 4 | 0.0163 |
| 34 57 | 4 | 0.0769 |
| 35 8 | 2 | 0.0604 |
| 36 108 | 6 | 0.0300 |
| 37 117 | 1 | 0.0442 |
| 38 39 | 7 | 0.5446 |
| 39 151 | 2 | 0.0654 |
| 40 33 | 2 | 0.1908 |
| 41 11 | 3 | 0.0700 |
| 42 168 | 7 | 0.8074 |
| 43 62 | 1 | 0.0495 |
| 44 132 | 1 | 0.0706 |

**Membership Matrix Section**

| Row | Cluster | Prob in 7 |
|---|---|---|
| 45 152 | 4 | 0.0205 |
| 46 129 | 7 | 0.5204 |
| 47 82 | 4 | 0.0548 |
| 48 171 | 7 | 0.6627 |
| 49 106 | 7 | 0.2403 |
| 50 136 | 4 | 0.0441 |
| 51 148 | 4 | 0.0188 |
| 52 17 | 2 | 0.0882 |
| 53 111 | 3 | 0.0854 |
| 54 86 | 7 | 0.7675 |
| 55 134 | 5 | 0.0565 |
| 56 53 | 4 | 0.0454 |
| 57 67 | 4 | 0.0378 |
| 58 88 | 5 | 0.0771 |
| 59 105 | 6 | 0.0704 |
| 60 133 | 4 | 0.0230 |
| 61 95 | 2 | 0.0605 |
| 62 12 | 2 | 0.1106 |
| 63 59 | 5 | 0.0891 |
| 64 162 | 1 | 0.0545 |
| 65 130 | 5 | 0.0720 |
| 66 158 | 3 | 0.0331 |
| 67 75 | 1 | 0.1325 |
| 68 15 | 1 | 0.1862 |
| 69 2 | 1 | 0.0498 |
| 70 36 | 5 | 0.0834 |
| 71 51 | 3 | 0.0349 |
| 72 52 | 7 | 0.4365 |
| 73 140 | 2 | 0.1072 |
| 74 131 | 4 | 0.0797 |
| 75 25 | 7 | 0.7148 |
| 76 147 | 2 | 0.1644 |
| 77 84 | 7 | 0.4728 |
| 78 104 | 4 | 0.0317 |
| 79 138 | 4 | 0.0303 |
| 80 21 | 4 | 0.0289 |
| 81 156 | 6 | 0.0281 |
| 82 81 | 2 | 0.2090 |
| 83 161 | 3 | 0.0679 |
| 84 170 | 4 | 0.0294 |
| 85 47 | 3 | 0.0194 |
| 86 122 | 4 | 0.0303 |
| 87 44 | 3 | 0.0287 |
| 88 54 | 2 | 0.1055 |

**Membership Matrix Section**

| Row | Cluster | Prob in 7 |
| --- | --- | --- |
| 89 40 | 1 | 0.0822 |
| 90 43 | 6 | 0.0359 |
| 91 154 | 4 | 0.0343 |
| 92 113 | 1 | 0.0821 |
| 93 49 | 1 | 0.0739 |
| 94 69 | 6 | 0.0610 |
| 95 35 | 4 | 0.0722 |
| 96 64 | 4 | 0.0153 |
| 97 139 | 2 | 0.0870 |
| 98 121 | 4 | 0.0135 |
| 99 91 | 3 | 0.0788 |
| 100 157 | 5 | 0.0942 |
| 101 61 | 5 | 0.0683 |
| 102 32 | 4 | 0.0430 |
| 103 112 | 2 | 0.2488 |
| 104 56 | 3 | 0.0415 |
| 105 7 | 3 | 0.0244 |
| 106 37 | 1 | 0.2530 |
| 107 1 | 3 | 0.0318 |
| 108 93 | 3 | 0.0314 |
| 109 22 | 7 | 0.6906 |
| 110 65 | 7 | 0.6112 |
| 111 50 | 4 | 0.0543 |
| 112 27 | 5 | 0.1242 |
| 113 141 | 3 | 0.0729 |
| 114 9 | 3 | 0.0488 |
| 115 160 | 6 | 0.0643 |
| 116 167 | 4 | 0.0218 |
| 117 149 | 2 | 0.0686 |
| 118 103 | 2 | 0.2182 |
| 119 3 | 7 | 0.8530 |
| 120 123 | 1 | 0.1647 |
| 121 83 | 2 | 0.2588 |
| 122 94 | 6 | 0.0412 |
| 123 153 | 4 | 0.0124 |
| 124 28 | 7 | 0.5240 |
| 125 144 | 6 | 0.1238 |
| 126 55 | 2 | 0.0643 |
| 127 159 | 4 | 0.0455 |
| 128 76 | 4 | 0.0176 |
| 129 127 | 6 | 0.0694 |
| 130 26 | 4 | 0.0133 |
| 131 19 | 4 | 0.0460 |
| 132 124 | 7 | 0.2913 |

**Membership Matrix Section**

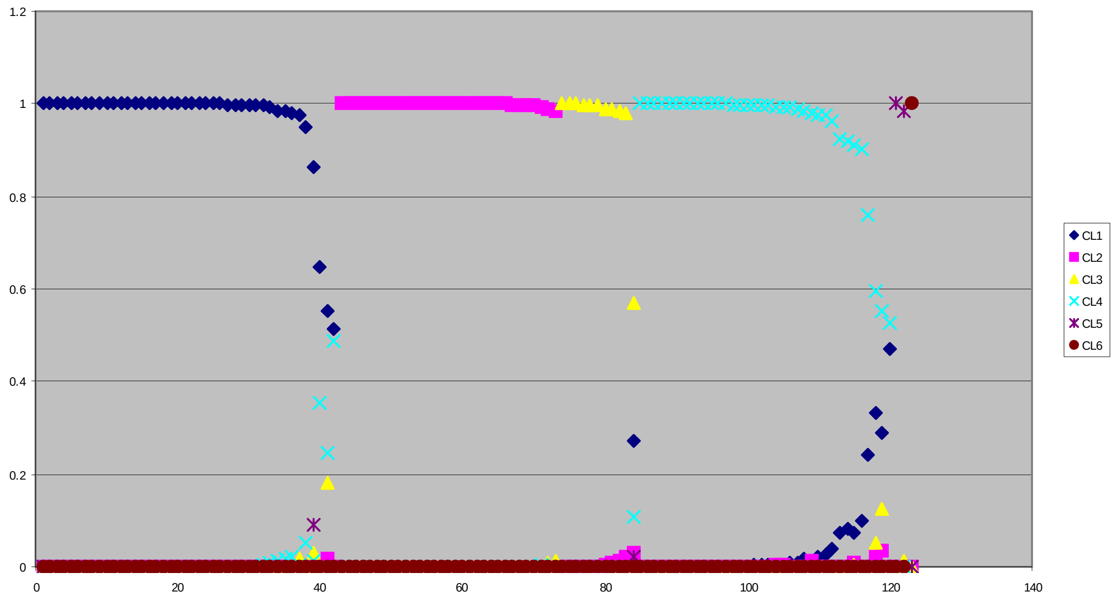
| Row | Cluster | Prob in 7 |
|---|---|---|
| 133 74 | 6 | 0.1595 |
| 134 66 | 5 | 0.0685 |
| 135 29 | 1 | 0.1104 |
| 136 80 | 1 | 0.2959 |
| 137 42 | 1 | 0.0654 |
| 138 89 | 6 | 0.0553 |
| 139 85 | 4 | 0.0202 |
| 140 142 | 5 | 0.0304 |
| 141 71 | 4 | 0.0416 |
| 142 46 | 2 | 0.2095 |
| 143 114 | 2 | 0.2955 |
| 144 126 | 2 | 0.0982 |
| 145 165 | 6 | 0.0728 |
| 146 38 | 7 | 0.6872 |
| 147 60 | 7 | 0.8635 |
| 148 18 | 3 | 0.0220 |
| 149 48 | 6 | 0.1472 |
| 150 125 | 4 | 0.0419 |
| 151 92 | 5 | 0.0809 |
| 152 78 | 6 | 0.2214 |
| 153 45 | 7 | 0.5972 |
| 154 23 | 6 | 0.0265 |
| 155 68 | 1 | 0.0315 |
| 156 87 | 3 | 0.0356 |
| 157 77 | 6 | 0.0887 |
| 158 79 | 2 | 0.3164 |
| 159 119 | 6 | 0.0742 |
| 160 70 | 4 | 0.0585 |
| 161 99 | 1 | 0.0373 |
| 162 109 | 4 | 0.0612 |
| 163 116 | 1 | 0.0617 |
| 164 146 | 3 | 0.1004 |
| 165 135 | 2 | 0.1304 |
| 166 24 | 3 | 0.0502 |
| 167 115 | 1 | 0.0374 |
| 168 73 | 2 | 0.0734 |
| 169 118 | 4 | 0.0365 |
| 170 97 | 7 | 0.6910 |
| 171 100 | 3 | 0.0191 |
| 172 150 | 2 | 0.0896 |

**Summary Section**

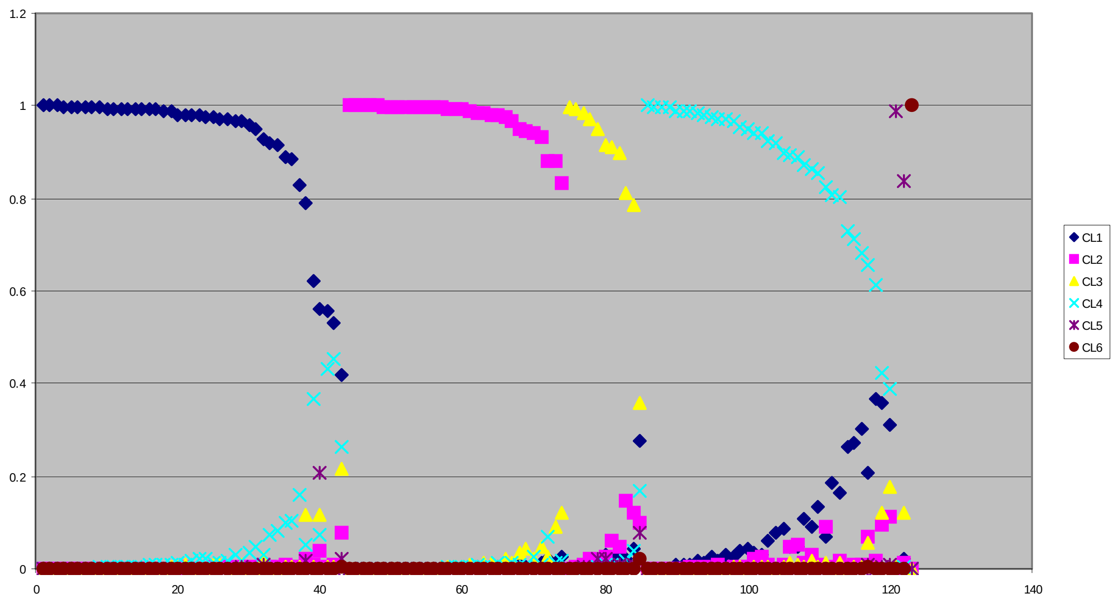
| Number Clusters | Average Distance | Average Silhouette | F(U) | Fc(U) | D(U) | Dc(U) |
|---|---|---|---|---|---|---|
| 7 | 32.198953 | 0.298528 | 0.4886 | 0.4034 | 0.2024 | 0.2362 |

# Appendix A4.6

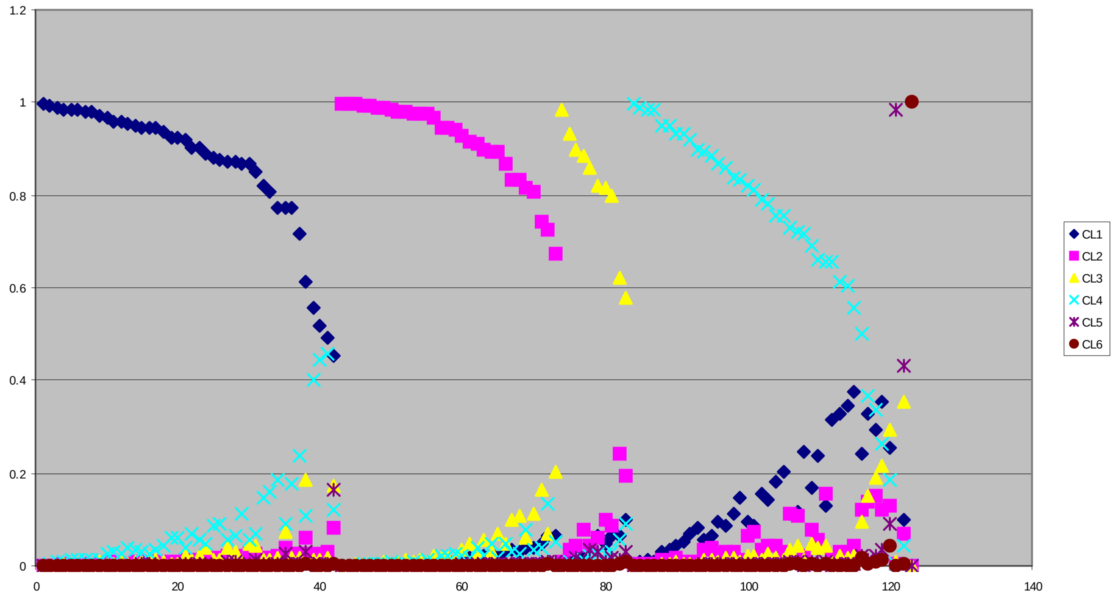
Fuzz Plots Training Dataset



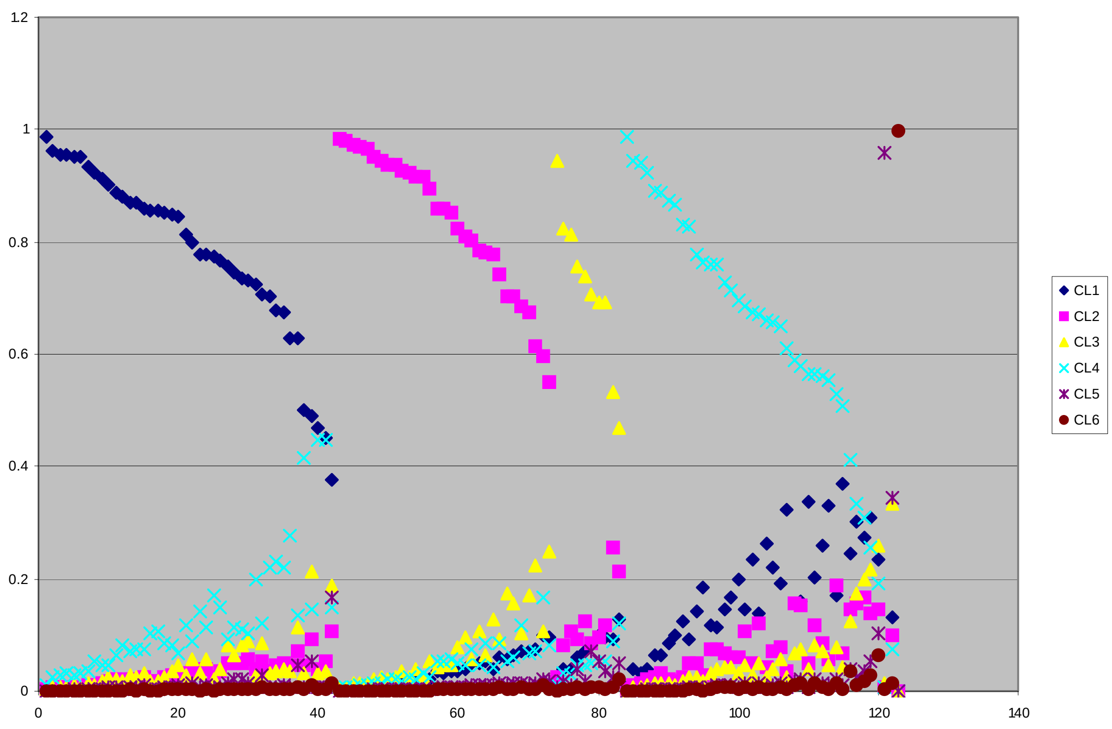

n= 6 m = 1.25



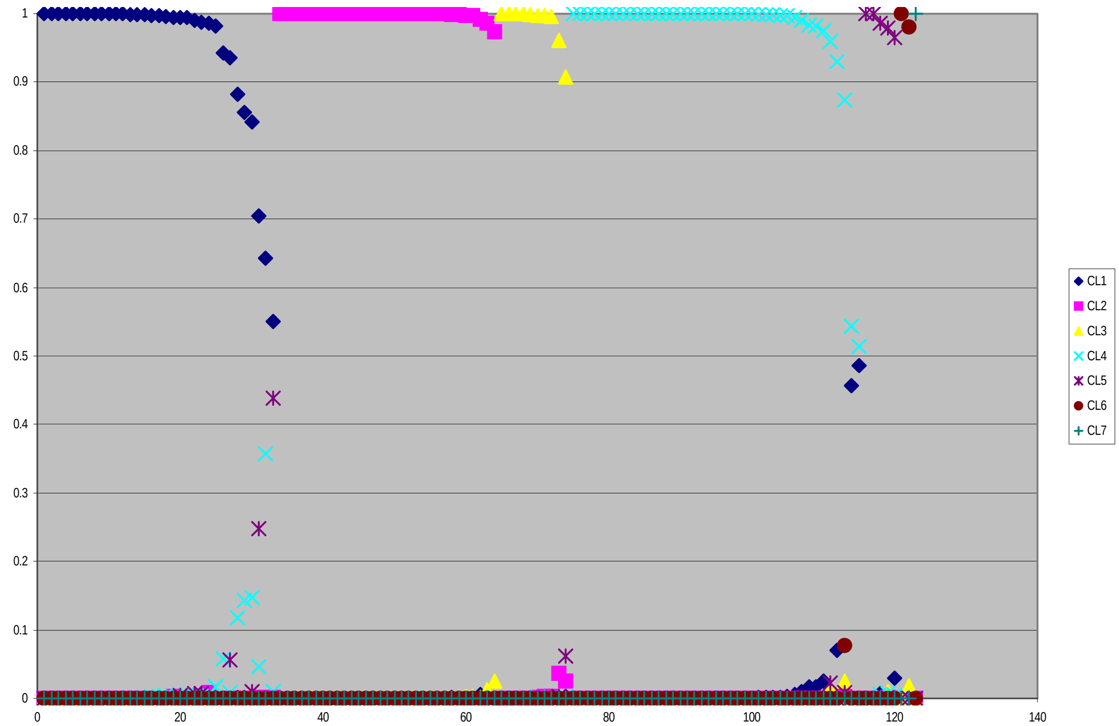

n= 6 m = 1.50



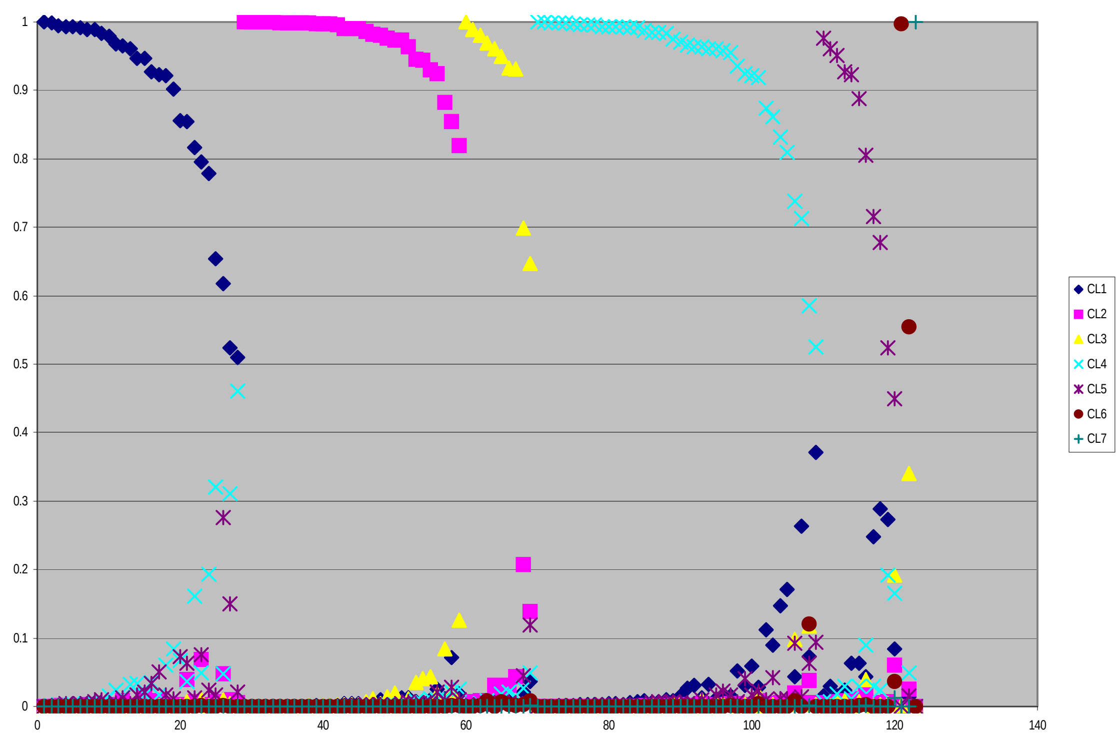

n= 6 m = 1.75



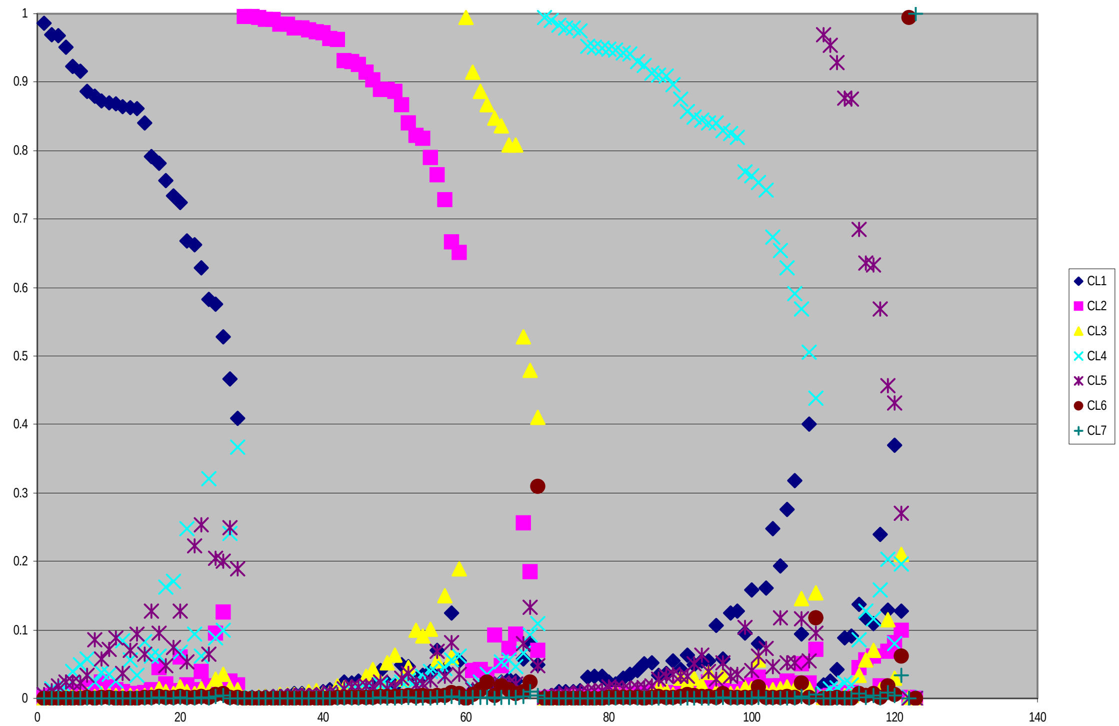

n= 6 m = 2.0



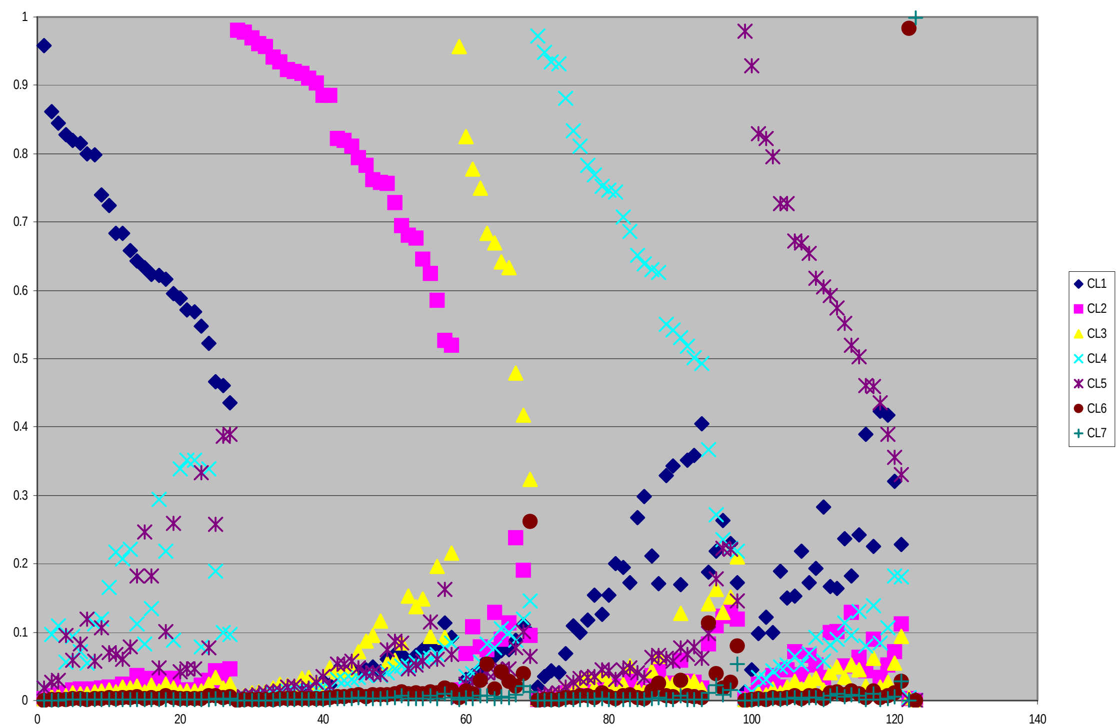

n= 7 m = 1.25



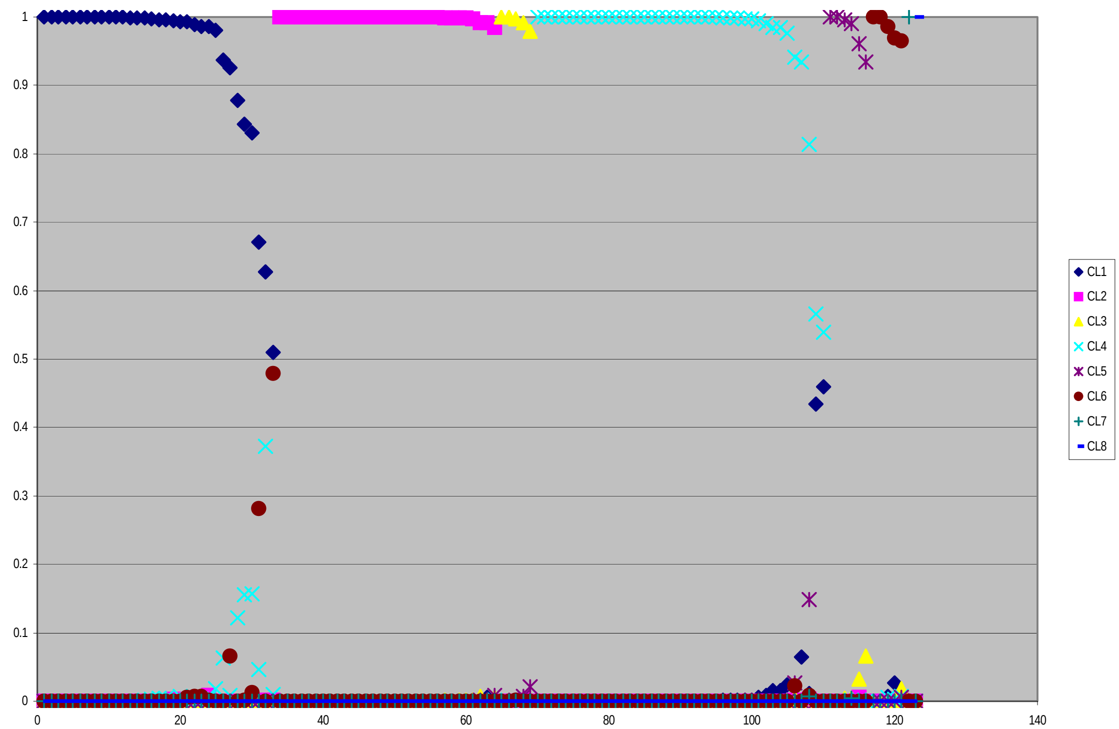

n= 7 m = 1.5



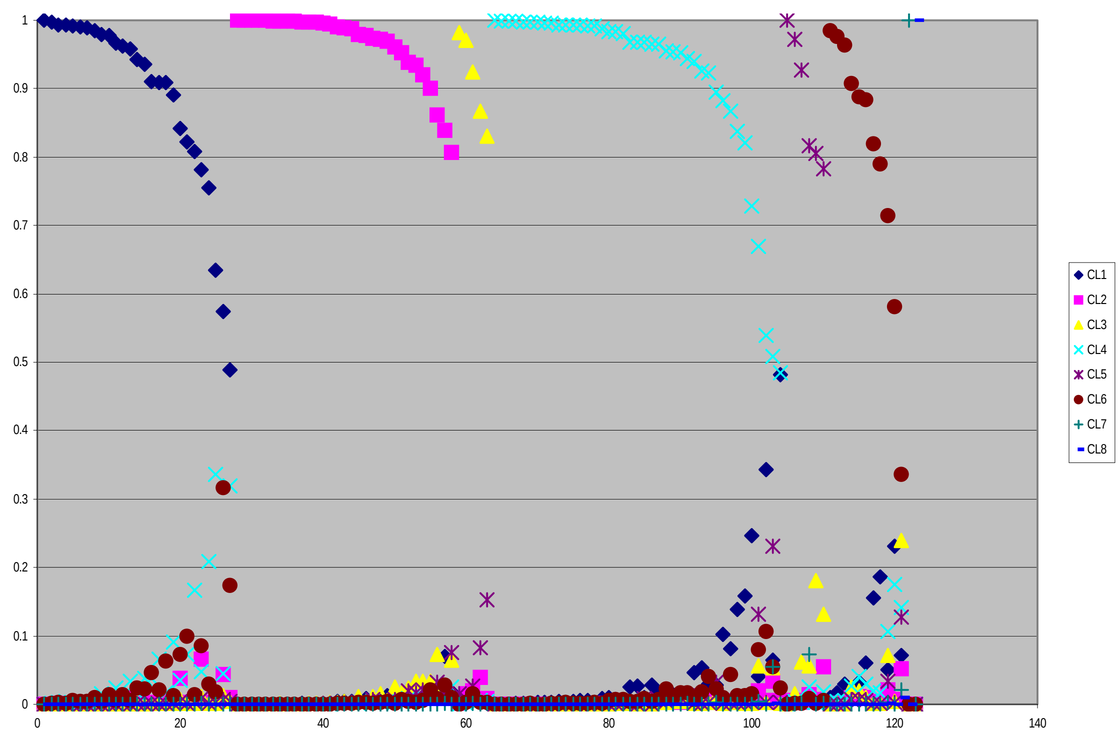

n= 7 m = 1.75



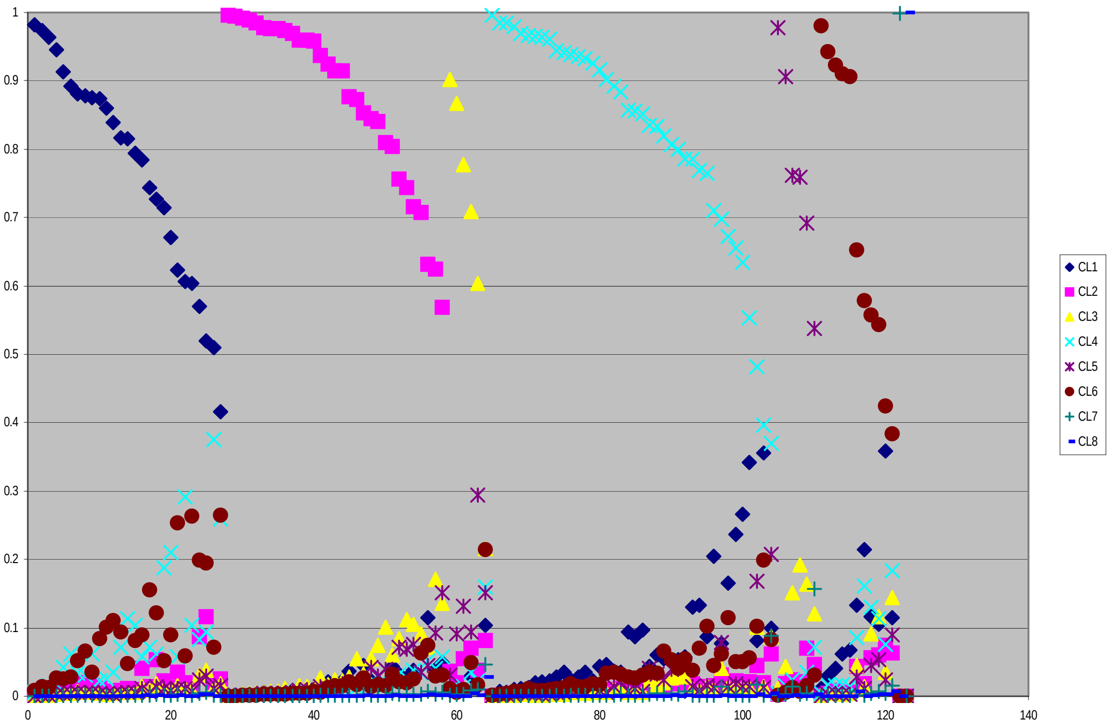

n= 7 m = 2.0



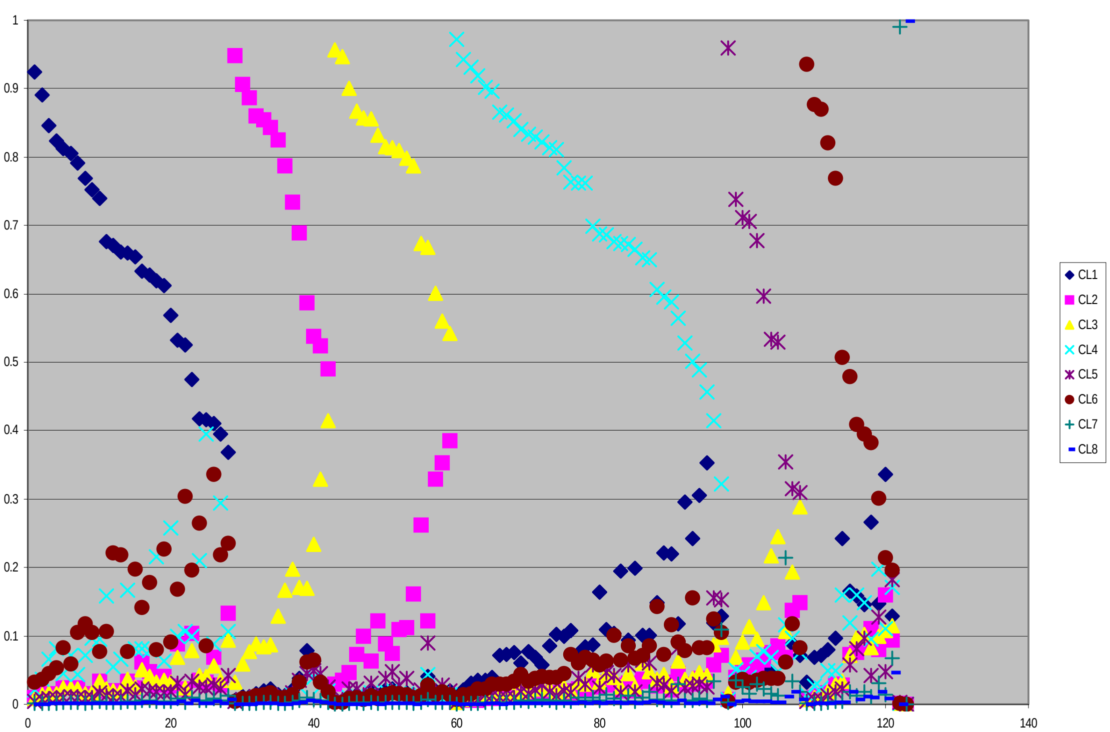

n= 8 m = 1.25




n= 8 m = 1.5



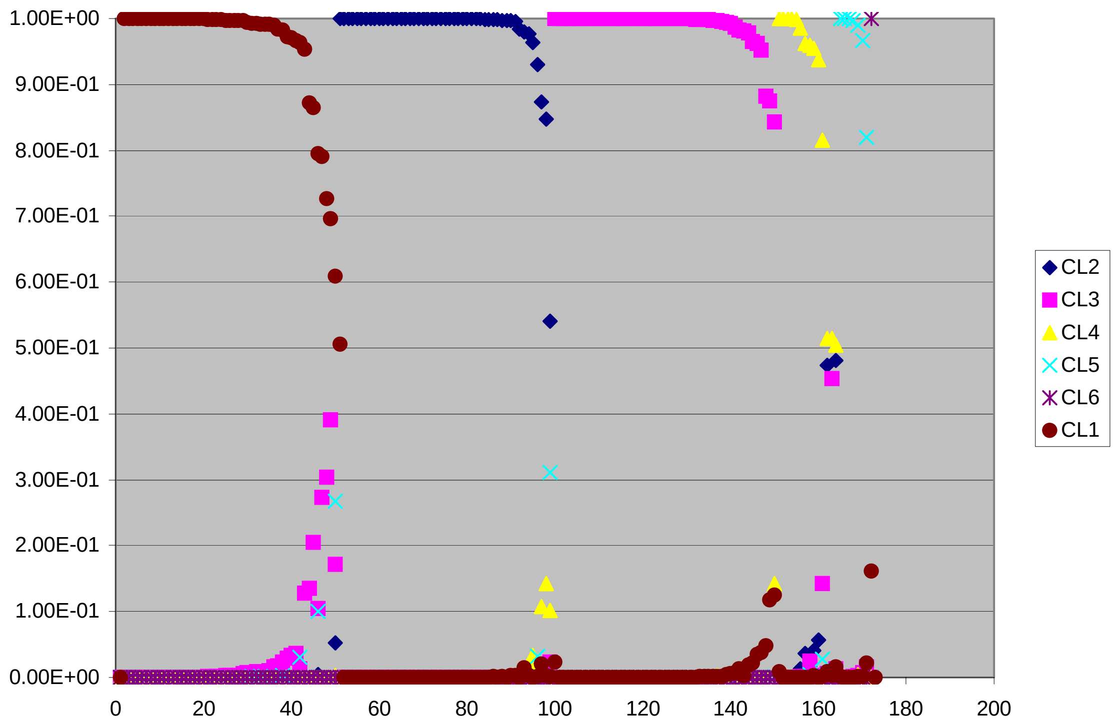

n= 8 m = 1.75



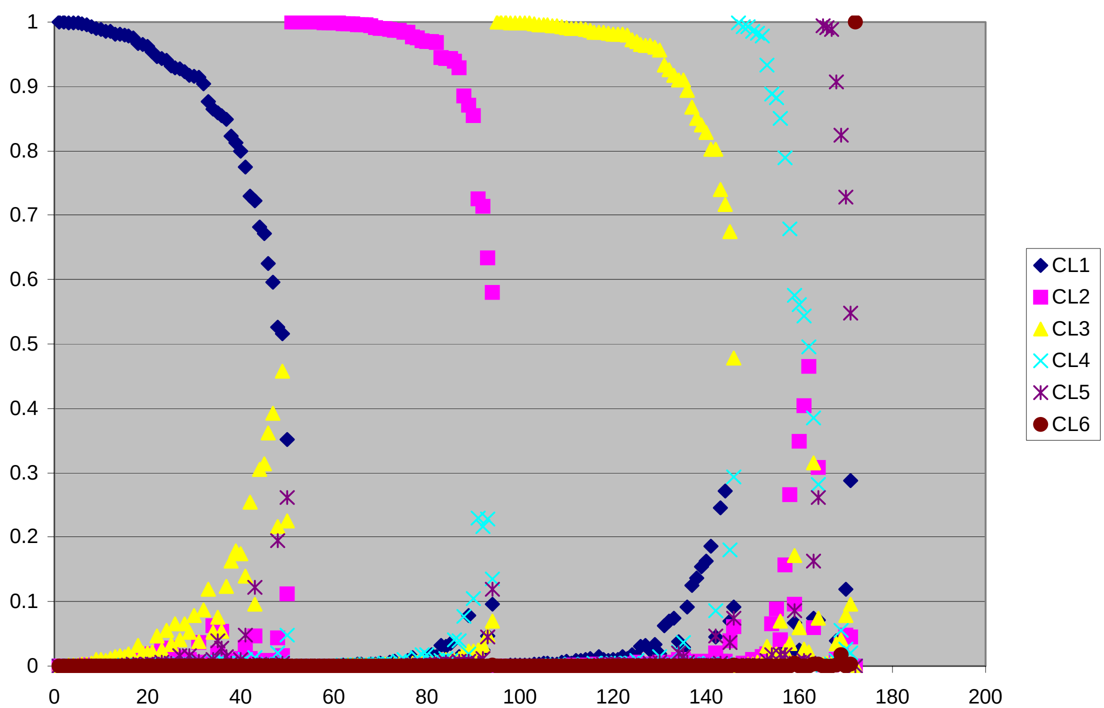

n= 8 m = 2.0

# Appendix A4.6a

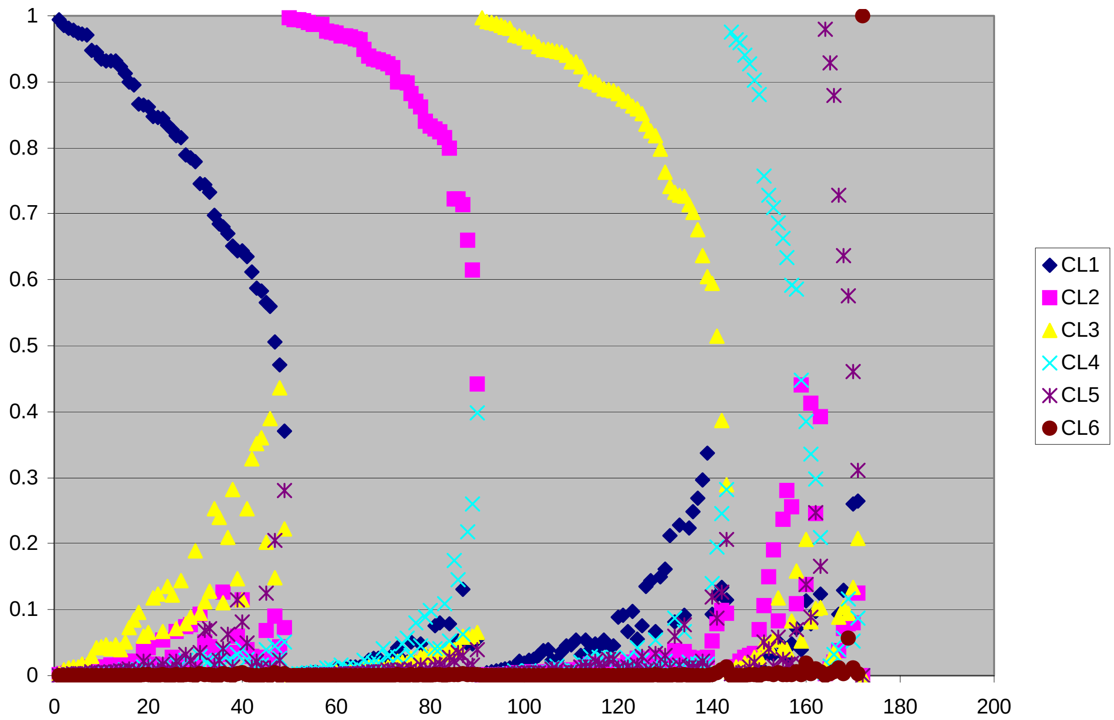
Fuzz plots of the full dataset



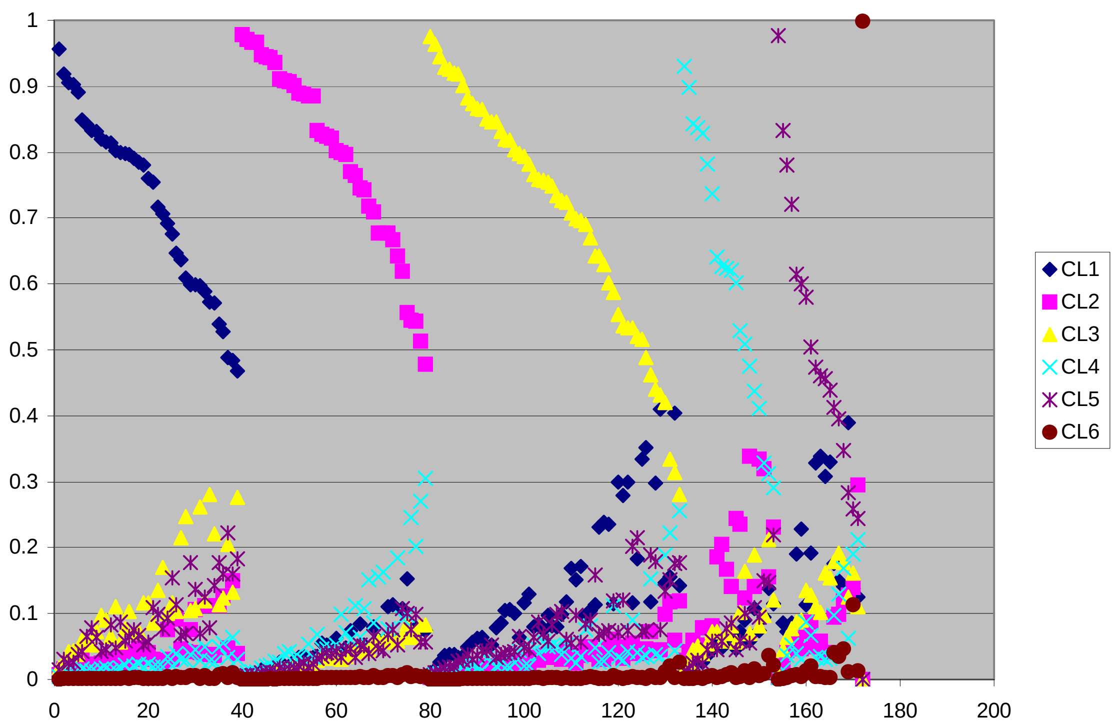

n=6 m =1.25



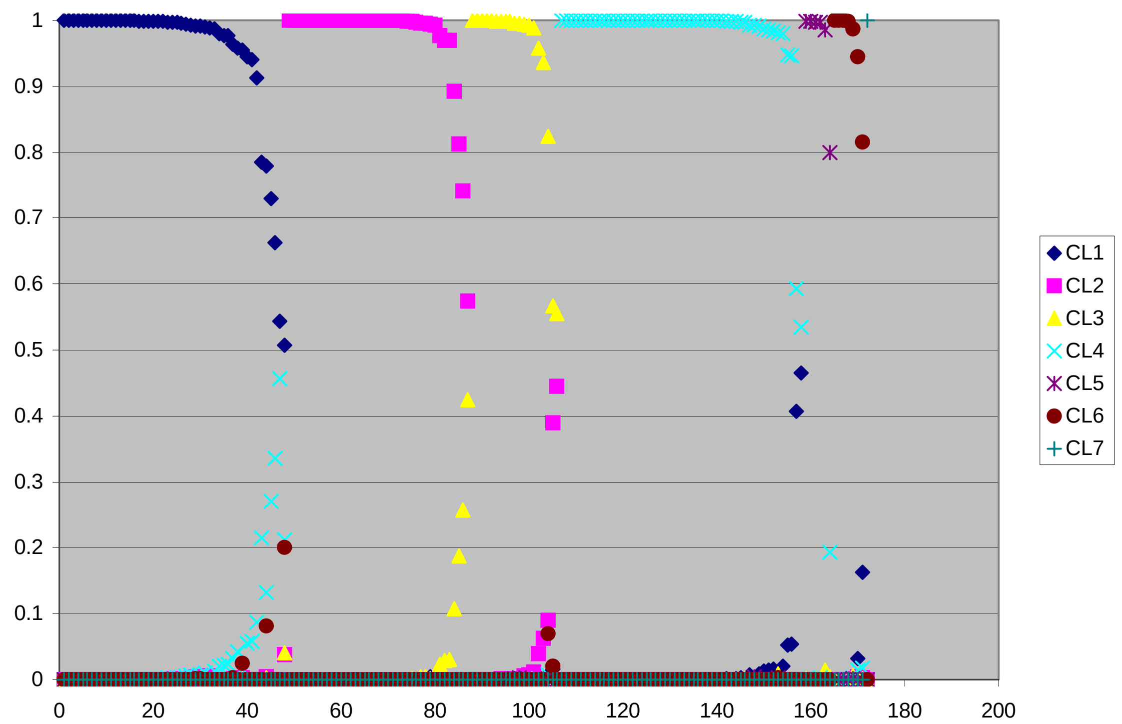

n=6 m =1.5



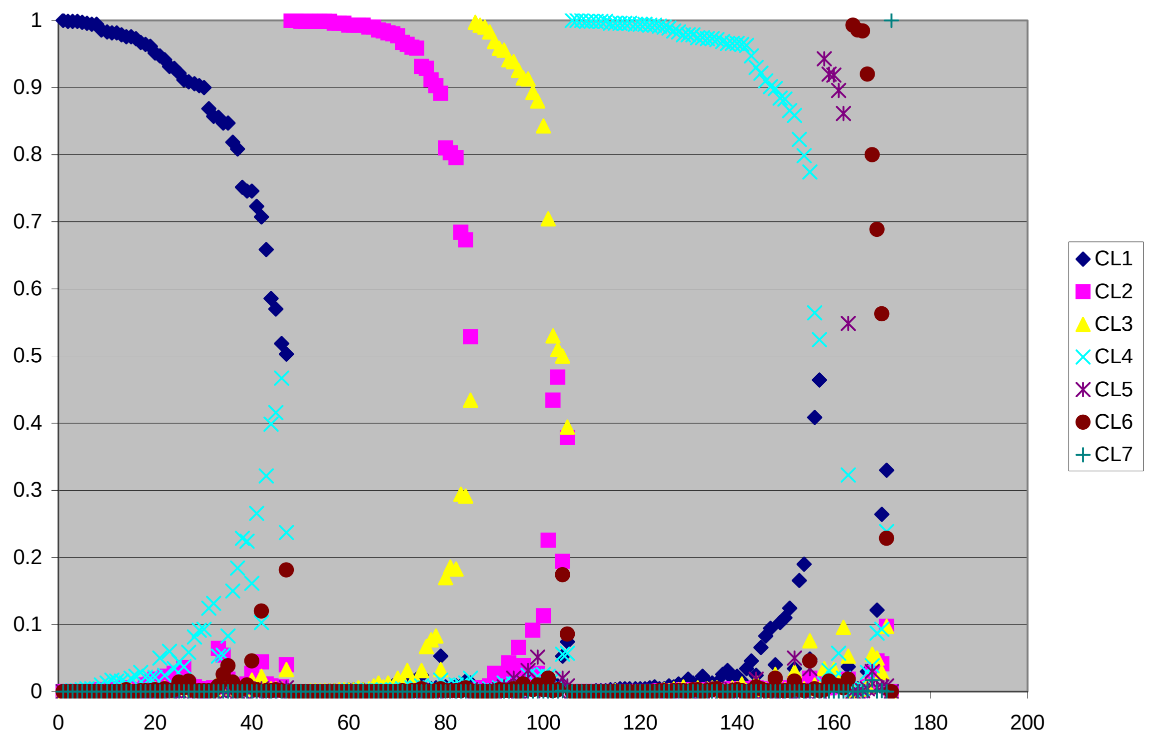

n=6 m =1.75



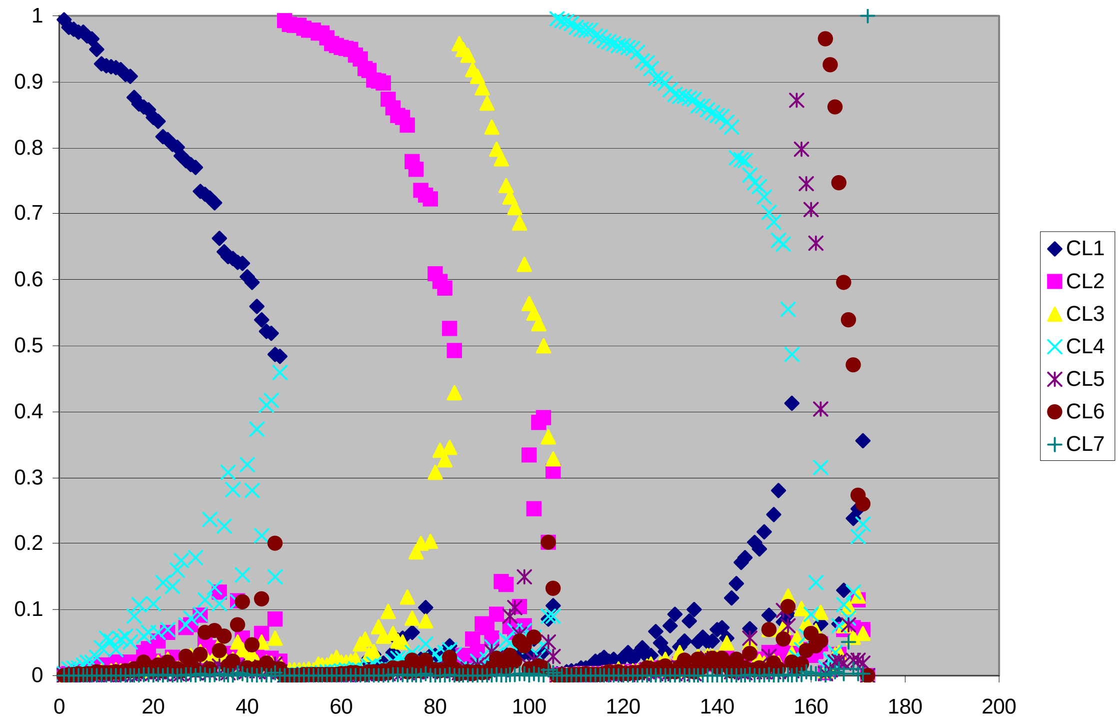

n=6 m =2.0



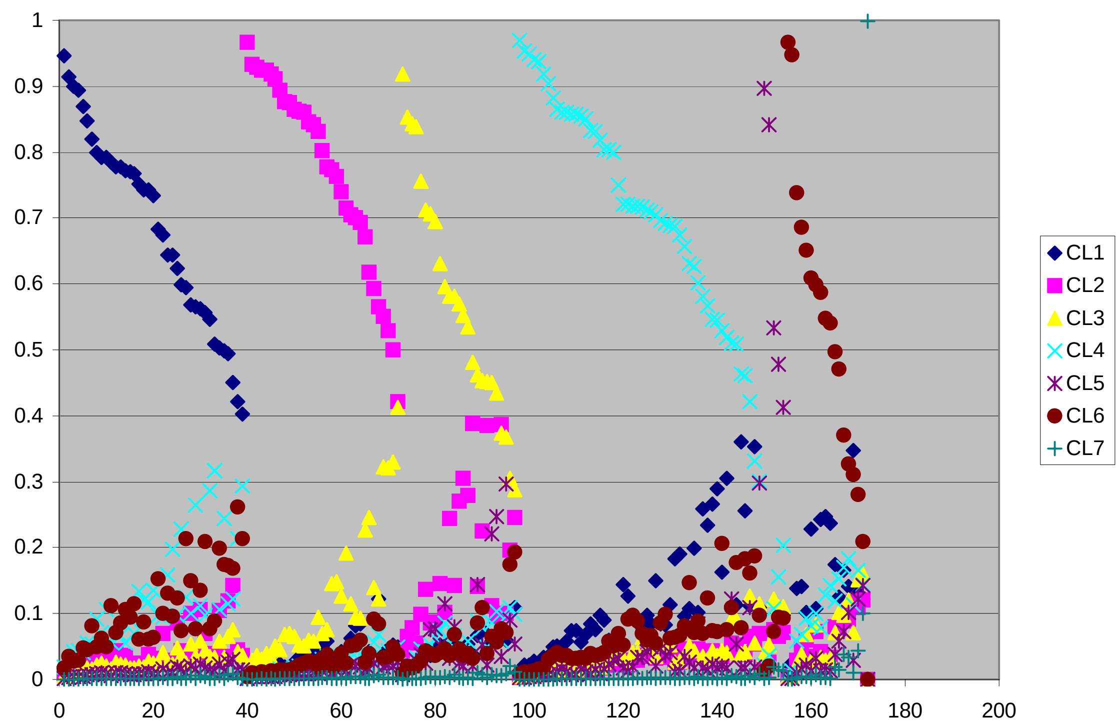

n=7 m =1.25



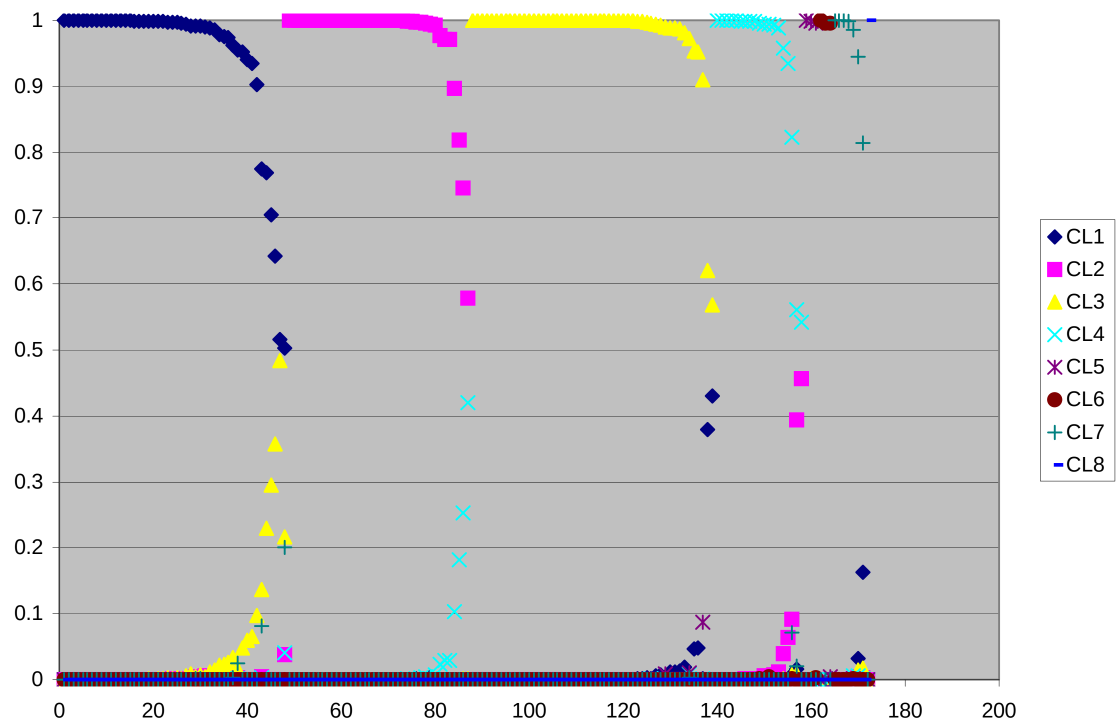

n=7m =1.50



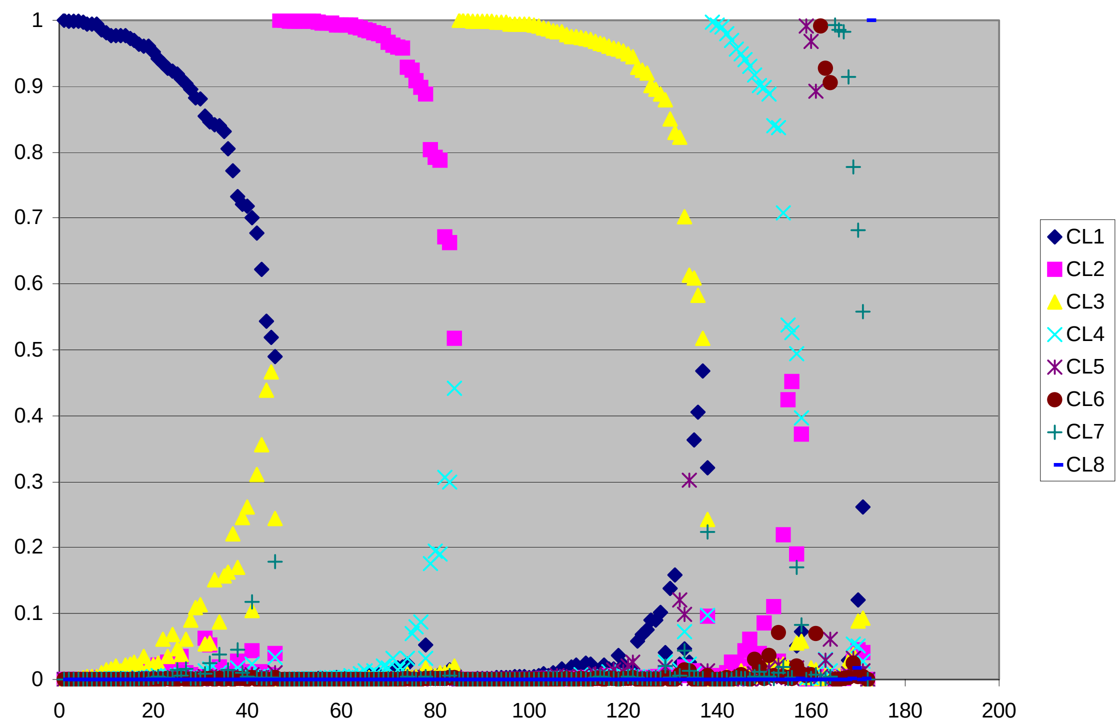

n=6 m =1.75



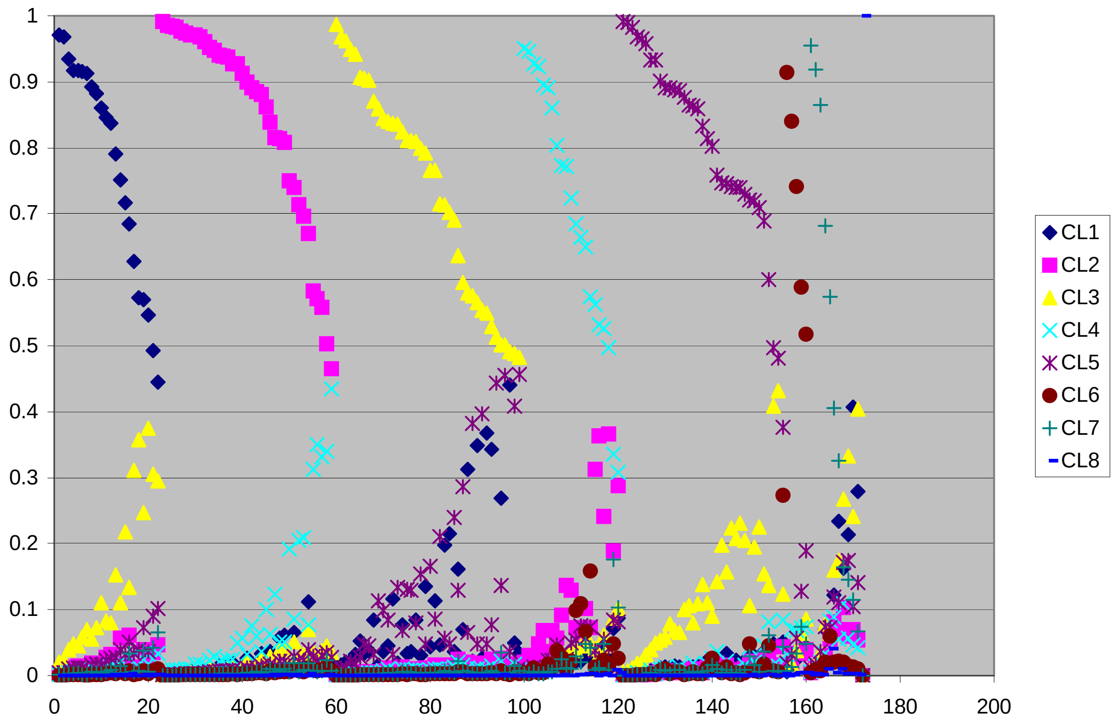

n=7 m =2.0



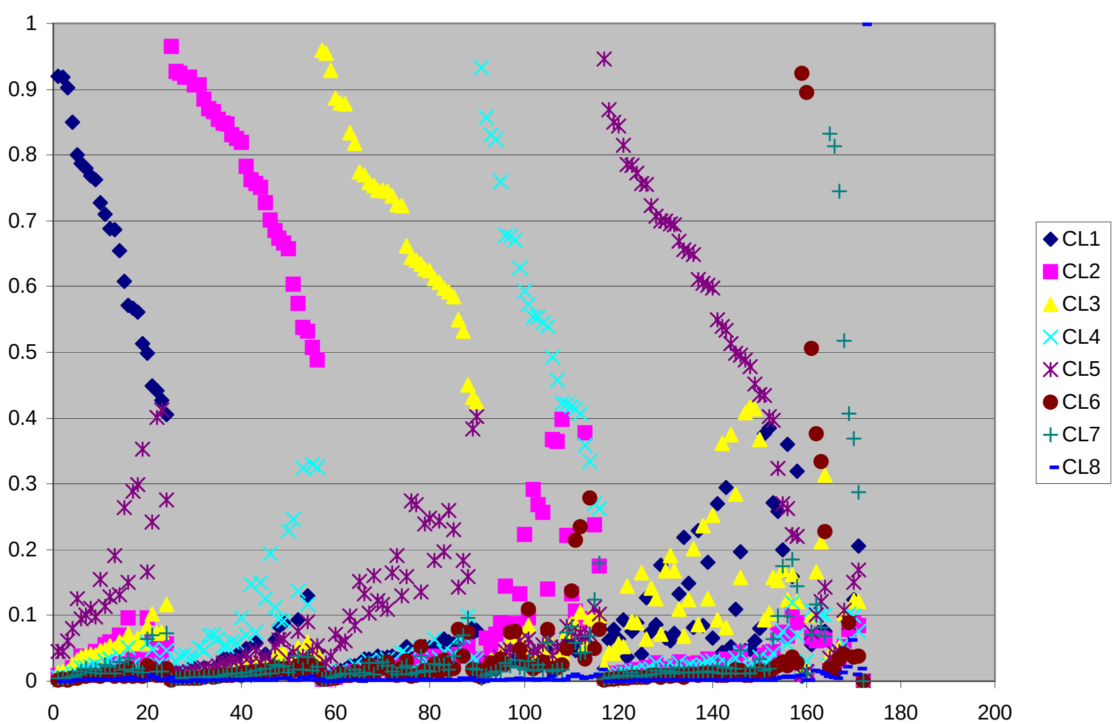

n=8 m =1.25




n=8 m =1.50




n=8 m =1.75




n=8 m =2.0

# Appendix A4.7a

**Analysis of Variance Report – KWZ Test 10%**

Response Extrev

**Tests of Assumptions Section**

| Assumption | Test Value | Prob Level | Decision (0.05) |
|---|---|---|---|
| Skewness Normality of Residuals | 12.4626 | 0.000000 | Reject |
| Kurtosis Normality of Residuals | 9.8309 | 0.000000 | Reject |
| Omnibus Normality of Residuals | 251.9621 | 0.000000 | Reject |
| Modified-Levene Equal-Variance Test | 9.7975 | 0.000000 | Reject |

**Expected Mean Squares Section**

| Source Term | DF | Term Fixed? | Denominator Term | Expected Mean Square |
|---|---|---|---|---|
| A: Cluster | 6 | Yes | S(A) | S+sA |
| S(A) | 265 | No | | S(A) |

Note: Expected Mean Squares are for the balanced cell-frequency case.

**Analysis of Variance Table**

| Source Term | DF | Sum of Squares | Mean Square | F-Ratio | Prob Level | Power (Alpha=0.05) |
|---|---|---|---|---|---|---|
| A: Cluster | 6 | 2.107798E+12 | 3.512997E+11 | 29.36 | 0.000000* | 1.000000 |
| S(A) | 265 | 3.170633E+12 | 1.196465E+10 | | | |
| Total (Adjusted) | 271 | 5.278431E+12 | | | | |
| Total | 272 | | | | | |

* Term significant at alpha = 0.05

**Kruskal-Wallis One-Way ANOVA on Ranks**
**Hypotheses**
Ho: All medians are equal.
Ha: At least two medians are different.

**Test Results**

| Method | DF | Chi-Square (H) | Prob Level | Decision(0.05) |
|---|---|---|---|---|
| Not Corrected for Ties | 6 | 59.2515 | 0.000000 | Reject Ho |
| Corrected for Ties | 6 | 59.25373 | 0.000000 | Reject Ho |

| | |
|---|---|
| Number Sets of Ties | 87 |
| Multiplicity Factor | 756 |

**Group Detail**

| Group | Count | Sum of Ranks | Mean Rank | Z-Value | Median |
|---|---|---|---|---|---|
| 1 | 50 | 7358.50 | 147.17 | 1.0617 | 101746.5 |
| 2 | 47 | 5261.50 | 111.95 | -2.3527 | 52567 |
| 3 | 37 | 5696.00 | 153.95 | 1.4513 | 121345 |
| 4 | 48 | 4587.00 | 95.56 | -3.9731 | 45607 |
| 5 | 18 | 4495.00 | 249.72 | 6.3192 | 331569 |
| 6 | 33 | 4036.00 | 122.30 | -1.1060 | 62346 |
| 7 | 39 | 5694.00 | 146.00 | 0.8149 | 83456 |

Analysis of Variance Report

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Database
Response Extrev

**Means and Effects Section**

| Term | Count | Mean | Standard Error | Effect |
|---|---|---|---|---|
| All | 272 | 116676.3 | | 143965 |
| A: Cluster | | | | |
| 1 | 50 | 113543.6 | 15469.1 | -30421.44 |
| 2 | 47 | 71191.98 | 15955.16 | -72773.02 |
| 3 | 37 | 126011.2 | 17982.46 | -17953.84 |
| 4 | 48 | 68680.25 | 15788.08 | -75284.75 |
| 5 | 18 | 438332.8 | 25781.83 | 294367.8 |
| 6 | 33 | 91018.85 | 19041.15 | -52946.15 |
| 7 | 39 | 98976.38 | 17515.31 | -44988.62 |

**Kruskal-Wallis Multiple-Comparison Z-Value Test**

| Extrev | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| 1 | 0.0000 | 2.2040 | 0.3972 | 3.2467 | 4.7429 |
| 2 | 2.2040 | 0.0000 | 2.4293 | 1.0150 | 6.3188 |
| 3 | 0.3972 | 2.4293 | 0.0000 | 3.3926 | 4.2369 |
| 4 | 3.2467 | 1.0150 | 3.3926 | 0.0000 | 7.0907 |
| 5 | 4.7429 | 6.3188 | 4.2369 | 7.0907 | 0.0000 |
| 6 | 1.4095 | 0.5797 | 1.6800 | 1.5033 | 5.5281 |
| 7 | 0.0696 | 1.9986 | 0.4402 | 2.9743 | 4.6274 |

Regular Test: Medians significantly different if z-value > 1.6449
Bonferroni Test: Medians significantly different if z-value > 2.8227

**Kruskal-Wallis Multiple-Comparison Z-Value Test**

| Extrev | 6 | 7 |
|---|---|---|
| 1 | 1.4095 | 0.0696 |
| 2 | 0.5797 | 1.9986 |
| 3 | 1.6800 | 0.4402 |
| 4 | 1.5033 | 2.9743 |
| 5 | 5.5281 | 4.6274 |
| 6 | 0.0000 | 1.2736 |
| 7 | 1.2736 | 0.0000 |

Regular Test: Medians significantly different if z-value > 1.6449
Bonferroni Test: Medians significantly different if z-value > 2.8227

## Analysis of Variance Report

Response SerExp

### Tests of Assumptions Section

| Assumption | Test Value | Prob Level | Decision (0.05) |
|---|---|---|---|
| Skewness Normality of Residuals | 11.7183 | 0.000000 | Reject |
| Kurtosis Normality of Residuals | 9.3151 | 0.000000 | Reject |
| Omnibus Normality of Residuals | 224.0885 | 0.000000 | Reject |
| Modified-Levene Equal-Variance Test | 7.9644 | 0.000000 | Reject |

### Expected Mean Squares Section

| Source Term | DF | Term Fixed? | Denominator Term | Expected Mean Square |
|---|---|---|---|---|
| A: Cluster | 6 | Yes | S(A) | S+sA |
| S(A) | 265 | No | | S(A) |

Note: Expected Mean Squares are for the balanced cell-frequency case.

### Analysis of Variance Table

| Source Term | DF | Sum of Squares | Mean Square | F-Ratio | Prob Level | Power (Alpha=0.05) |
|---|---|---|---|---|---|---|
| A: Cluster | 6 | 1.302156E+10 | 2.17026E+09 | 15.74 | 0.000000* | 1.000000 |
| S(A) | 265 | 3.652846E+10 | 1.378432E+08 | | | |
| Total (Adjusted) | 271 | 4.955002E+10 | | | | |
| Total | 272 | | | | | |

* Term significant at alpha = 0.05

### Kruskal-Wallis One-Way ANOVA on Ranks

**Hypotheses**

Ho: All medians are equal.

Ha: At least two medians are different.

### Test Results

| Method | DF | Chi-Square (H) | Prob Level | Decision(0.05) |
|---|---|---|---|---|
| Not Corrected for Ties | 6 | 44.20516 | 0.000000 | Reject Ho |
| Corrected for Ties | 6 | 44.20682 | 0.000000 | Reject Ho |

| | |
|---|---|
| Number Sets of Ties | 87 |
| Multiplicity Factor | 756 |

### Group Detail

| Group | Count | Sum of Ranks | Mean Rank | Z-Value | Median |
|---|---|---|---|---|---|
| 1 | 50 | 6778.50 | 135.57 | -0.0925 | 8599.5 |
| 2 | 47 | 4806.50 | 102.27 | -3.2804 | 4989 |
| 3 | 37 | 4522.00 | 122.22 | -1.1883 | 8027 |
| 4 | 48 | 5496.00 | 114.50 | -2.1352 | 5157 |
| 5 | 18 | 4116.00 | 228.67 | 5.1440 | 25181 |
| 6 | 33 | 5245.00 | 158.94 | 1.7481 | 9413 |
| 7 | 39 | 6164.00 | 158.05 | 1.8486 | 10210 |

## Analysis of Variance Report

Response SerExp

### Means and Effects Section

| Term | Count | Mean | Standard Error | Effect |
|---|---|---|---|---|
| All | 272 | 11370.89 | | 13595.13 |
| A: Cluster | | | | |
| 1 | 50 | 9412.24 | 1660.381 | -4182.892 |
| 2 | 47 | 5980.702 | 1712.552 | -7614.43 |
| 3 | 37 | 8472.703 | 1930.154 | -5122.429 |
| 4 | 48 | 9014.833 | 1694.619 | -4580.298 |
| 5 | 18 | 35537 | 2767.302 | 21941.87 |
| 6 | 33 | 14646.73 | 2043.788 | 1051.595 |
| 7 | 39 | 12101.72 | 1880.011 | -1493.414 |

### Kruskal-Wallis Multiple-Comparison Z-Value Test

| SerExp | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| 1 | 0.0000 | 2.0839 | 0.7828 | 1.3255 | 4.3056 |
| 2 | 2.0839 | 0.0000 | 1.1540 | 0.7579 | 5.7971 |
| 3 | 0.7828 | 1.1540 | 0.0000 | 0.4484 | 4.7091 |
| 4 | 1.3255 | 0.7579 | 0.4484 | 0.0000 | 5.2512 |
| 5 | 4.3056 | 5.7971 | 4.7091 | 5.2512 | 0.0000 |
| 6 | 1.3246 | 3.1723 | 1.9498 | 2.4983 | 3.0251 |
| 7 | 1.3378 | 3.2740 | 1.9850 | 2.5682 | 3.1504 |

Regular Test: Medians significantly different if z-value > 1.6449
Bonferroni Test: Medians significantly different if z-value > 2.8227

### Kruskal-Wallis Multiple-Comparison Z-Value Test

| SerExp | 6 | 7 |
|---|---|---|
| 1 | 1.3246 | 1.3378 |
| 2 | 3.1723 | 3.2740 |
| 3 | 1.9498 | 1.9850 |
| 4 | 2.4983 | 2.5682 |
| 5 | 3.0251 | 3.1504 |
| 6 | 0.0000 | 0.0477 |
| 7 | 0.0477 | 0.0000 |

Regular Test: Medians significantly different if z-value > 1.6449
Bonferroni Test: Medians significantly different if z-value > 2.8227

## Analysis of Variance Report

Response Invest

**Tests of Assumptions Section**

| Assumption | Test Value | Prob Level | Decision (0.05) |
|---|---|---|---|
| Skewness Normality of Residuals | 12.3854 | 0.000000 | Reject |
| Kurtosis Normality of Residuals | 9.7623 | 0.000000 | Reject |
| Omnibus Normality of Residuals | 248.7021 | 0.000000 | Reject |
| Modified-Levene Equal-Variance Test | 7.0472 | 0.000001 | Reject |

**Expected Mean Squares Section**

| Source Term | DF | Term Fixed? | Denominator Term | Expected Mean Square |
|---|---|---|---|---|
| A: Cluster | 6 | Yes | S(A) | S+sA |
| S(A) | 265 | No | | S(A) |

Note: Expected Mean Squares are for the balanced cell-frequency case.

**Analysis of Variance Table**

| Source Term | DF | Sum of Squares | Mean Square | F-Ratio | Prob Level | Power (Alpha=0.05) |
|---|---|---|---|---|---|---|
| A: Cluster | 6 | 2.138927E+12 | 3.564878E+11 | 29.17 | 0.000000* | 1.000000 |
| S(A) | 265 | 3.23906E+12 | 1.222287E+10 | | | |
| Total (Adjusted) | 271 | 5.377986E+12 | | | | |
| Total | 272 | | | | | |

* Term significant at alpha = 0.05

**Kruskal-Wallis One-Way ANOVA on Ranks**
**Hypotheses**
Ho: All medians are equal.
Ha: At least two medians are different.

**Test Results**

| Method | DF | Chi-Square (H) | Prob Level | Decision(0.05) |
|---|---|---|---|---|
| Not Corrected for Ties | 6 | 58.09122 | 0.000000 | Reject Ho |
| Corrected for Ties | 6 | 58.0934 | 0.000000 | Reject Ho |

| | |
|---|---|
| Number Sets of Ties | 87 |
| Multiplicity Factor | 756 |

**Group Detail**

| Group | Count | Sum of Ranks | Mean Rank | Z-Value | Median |
|---|---|---|---|---|---|
| 1 | 50 | 7205.50 | 144.11 | 0.7572 | 113182.5 |
| 2 | 47 | 4767.50 | 101.44 | -3.3599 | 52624 |
| 3 | 37 | 5064.00 | 136.86 | 0.0304 | 81388 |
| 4 | 48 | 5196.00 | 108.25 | -2.7417 | 61923 |
| 5 | 18 | 4607.00 | 255.94 | 6.6665 | 333127.5 |
| 6 | 33 | 4601.00 | 139.42 | 0.2278 | 94393 |
| 7 | 39 | 5687.00 | 145.82 | 0.7995 | 113479 |

## Analysis of Variance Report

Response Invest

### Means and Effects Section

| Term | Count | Mean | Standard Error | Effect |
|---|---|---|---|---|
| All | 272 | 126172.2 | | 154149.3 |
| A: Cluster | | | | |
| 1 | 50 | 118246.9 | 15635.13 | -35902.39 |
| 2 | 47 | 73663.21 | 16126.41 | -80486.04 |
| 3 | 37 | 120808.5 | 18175.47 | -33340.8 |
| 4 | 48 | 85608.59 | 15957.54 | -68540.67 |
| 5 | 18 | 452413.7 | 26058.55 | 298264.4 |
| 6 | 33 | 113685.2 | 19245.52 | -40464.07 |
| 7 | 39 | 114618.8 | 17703.3 | -39530.43 |

### Kruskal-Wallis Multiple-Comparison Z-Value Test

| Invest | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| 1 | 0.0000 | 2.6702 | 0.4247 | 2.2560 | 5.1722 |
| 2 | 2.6702 | 0.0000 | 2.0493 | 0.4221 | 7.0862 |
| 3 | 0.4247 | 2.0493 | 0.0000 | 1.6628 | 5.2678 |
| 4 | 2.2560 | 0.4221 | 1.6628 | 0.0000 | 6.7933 |
| 5 | 5.1722 | 7.0862 | 5.2678 | 6.7933 | 0.0000 |
| 6 | 0.2656 | 2.1264 | 0.1359 | 1.7525 | 5.0552 |
| 7 | 0.1018 | 2.6049 | 0.4961 | 2.2155 | 4.9130 |

Regular Test: Medians significantly different if z-value > 1.6449
Bonferroni Test: Medians significantly different if z-value > 2.8227

### Kruskal-Wallis Multiple-Comparison Z-Value Test

| Invest | 6 | 7 |
|---|---|---|
| 1 | 0.2656 | 0.1018 |
| 2 | 2.1264 | 2.6049 |
| 3 | 0.1359 | 0.4961 |
| 4 | 1.7525 | 2.2155 |
| 5 | 5.0552 | 4.9130 |
| 6 | 0.0000 | 0.3438 |
| 7 | 0.3438 | 0.0000 |

Regular Test: Medians significantly different if z-value > 1.6449
Bonferroni Test: Medians significantly different if z-value > 2.8227

## Analysis of Variance Report

Response Index

### Tests of Assumptions Section

| Assumption | Test Value | Prob Level | Decision (0.05) |
|---|---|---|---|
| Skewness Normality of Residuals | 8.0618 | 0.000000 | Reject |
| Kurtosis Normality of Residuals | 6.1019 | 0.000000 | Reject |
| Omnibus Normality of Residuals | 102.2252 | 0.000000 | Reject |
| Modified-Levene Equal-Variance Test | 2.8671 | 0.010079 | Reject |

### Expected Mean Squares Section

| Source Term | DF | Term Fixed? | Denominator Term | Expected Mean Square |
|---|---|---|---|---|
| A: Cluster | 6 | Yes | S(A) | S+sA |
| S(A) | 265 | No | | S(A) |

Note: Expected Mean Squares are for the balanced cell-frequency case.

### Analysis of Variance Table

| Source Term | DF | Sum of Squares | Mean Square | F-Ratio | Prob Level | Power (Alpha=0.05) |
|---|---|---|---|---|---|---|
| A: Cluster | 6 | 57377.45 | 9562.909 | 33.98 | 0.000000* | 1.000000 |
| S(A) | 265 | 74579.76 | 281.433 | | | |
| Total (Adjusted) | 271 | 131957.2 | | | | |
| Total | 272 | | | | | |

* Term significant at alpha = 0.05

### Kruskal-Wallis One-Way ANOVA on Ranks

**Hypotheses**

Ho: All medians are equal.
Ha: At least two medians are different.

### Test Results

| Method | DF | Chi-Square (H) | Prob Level | Decision(0.05) |
|---|---|---|---|---|
| Not Corrected for Ties | 6 | 148.0753 | 0.000000 | Reject Ho |
| Corrected for Ties | 6 | 148.0858 | 0.000000 | Reject Ho |

| | |
|---|---|
| Number Sets of Ties | 85 |
| Multiplicity Factor | 1428 |

### Group Detail

| Group | Count | Sum of Ranks | Mean Rank | Z-Value | Median |
|---|---|---|---|---|---|
| 1 | 50 | 4454.50 | 89.09 | -4.7172 | 66.95 |
| 2 | 47 | 8052.50 | 171.33 | 3.3375 | 82.4 |
| 3 | 37 | 1864.00 | 50.38 | -7.1645 | 59.5 |
| 4 | 48 | 4844.50 | 100.93 | -3.4524 | 69.15 |
| 5 | 18 | 2660.50 | 147.81 | 0.6310 | 73 |
| 6 | 33 | 6870.00 | 208.18 | 5.5844 | 90.3 |
| 7 | 39 | 8382.00 | 214.92 | 6.7268 | 90.5 |

**Analysis of Variance Report**

Response Index

**Means and Effects Section**

| Term | Count | Mean | Standard Error | Effect |
|---|---|---|---|---|
| All | 272 | 77.35662 | | 78.45712 |
| A: Cluster | | | | |
| 1 | 50 | 65.974 | 2.37248 | -12.48312 |
| 2 | 47 | 83.44255 | 2.447026 | 4.985434 |
| 3 | 37 | 56.78378 | 2.757952 | -21.67334 |
| 4 | 48 | 67.97708 | 2.421402 | -10.48004 |
| 5 | 18 | 79.96111 | 3.954133 | 1.503992 |
| 6 | 33 | 98.34849 | 2.920321 | 19.89137 |
| 7 | 39 | 96.71282 | 2.686305 | 18.2557 |

**Kruskal-Wallis Multiple-Comparison Z-Value Test**

| Index | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| 1 | 0.0000 | 5.1460 | 2.2694 | 0.7447 | 2.7156 |
| 2 | 5.1460 | 0.0000 | 6.9962 | 4.3615 | 1.0789 |
| 3 | 2.2694 | 6.9962 | 0.0000 | 2.9374 | 4.3100 |
| 4 | 0.7447 | 4.3615 | 2.9374 | 0.0000 | 2.1562 |
| 5 | 2.7156 | 1.0789 | 4.3100 | 2.1562 | 0.0000 |
| 6 | 6.7503 | 2.0628 | 8.3785 | 6.0296 | 2.6195 |
| 7 | 7.4879 | 2.5585 | 9.1149 | 6.7224 | 2.9944 |

Regular Test: Medians significantly different if z-value > 1.6449
Bonferroni Test: Medians significantly different if z-value > 2.8227

**Kruskal-Wallis Multiple-Comparison Z-Value Test**

| Index | 6 | 7 |
|---|---|---|
| 1 | 6.7503 | 7.4879 |
| 2 | 2.0628 | 2.5585 |
| 3 | 8.3785 | 9.1149 |
| 4 | 6.0296 | 6.7224 |
| 5 | 2.6195 | 2.9944 |
| 6 | 0.0000 | 0.3623 |
| 7 | 0.3623 | 0.0000 |

Regular Test: Medians significantly different if z-value > 1.6449
Bonferroni Test: Medians significantly different if z-value > 2.8227

# Appendix A4.7b

**Analysis of Variance Report – KWZ Test 15%**
Response Extrev

**Tests of Assumptions Section**

| Assumption | Test Value | Prob Level | Decision (0.05) |
|---|---|---|---|
| Skewness Normality of Residuals | 12.4626 | 0.000000 | Reject |
| Kurtosis Normality of Residuals | 9.8309 | 0.000000 | Reject |
| Omnibus Normality of Residuals | 251.9621 | 0.000000 | Reject |
| Modified-Levene Equal-Variance Test | 9.7975 | 0.000000 | Reject |

**Expected Mean Squares Section**

| Source Term | DF | Term Fixed? | Denominator Term | Expected Mean Square |
|---|---|---|---|---|
| A: Cluster | 6 | Yes | S(A) | S+sA |
| S(A) | 265 | No | | S(A) |

Note: Expected Mean Squares are for the balanced cell-frequency case.

**Analysis of Variance Table**

| Source Term | DF | Sum of Squares | Mean Square | F-Ratio | Prob Level | Power (Alpha=0.05) |
|---|---|---|---|---|---|---|
| A: Cluster | 6 | 2.107798E+12 | 3.512997E+11 | 29.36 | 0.000000* | 1.000000 |
| S(A) | 265 | 3.170633E+12 | 1.196465E+10 | | | |
| Total (Adjusted) | 271 | 5.278431E+12 | | | | |
| Total | 272 | | | | | |

* Term significant at alpha = 0.05

**Kruskal-Wallis One-Way ANOVA on Ranks**
**Hypotheses**
Ho: All medians are equal.
Ha: At least two medians are different.

**Test Results**

| Method | DF | Chi-Square (H) | Prob Level | Decision(0.05) |
|---|---|---|---|---|
| Not Corrected for Ties | 6 | 59.2515 | 0.000000 | Reject Ho |
| Corrected for Ties | 6 | 59.25373 | 0.000000 | Reject Ho |

| | |
|---|---|
| Number Sets of Ties | 87 |
| Multiplicity Factor | 756 |

**Group Detail**

| Group | Count | Sum of Ranks | Mean Rank | Z-Value | Median |
|---|---|---|---|---|---|
| 1 | 50 | 7358.50 | 147.17 | 1.0617 | 101746.5 |
| 2 | 47 | 5261.50 | 111.95 | -2.3527 | 52567 |
| 3 | 37 | 5696.00 | 153.95 | 1.4513 | 121345 |
| 4 | 48 | 4587.00 | 95.56 | -3.9731 | 45607 |
| 5 | 18 | 4495.00 | 249.72 | 6.3192 | 331569 |
| 6 | 33 | 4036.00 | 122.30 | -1.1060 | 62346 |
| 7 | 39 | 5694.00 | 146.00 | 0.8149 | 83456 |

Response Extrev

**Means and Effects Section**

| Term | Count | Mean | Standard Error | Effect |
|---|---|---|---|---|
| All | 272 | 116676.3 | | 143965 |
| A: Cluster | | | | |
| 1 | 50 | 113543.6 | 15469.1 | -30421.44 |
| 2 | 47 | 71191.98 | 15955.16 | -72773.02 |
| 3 | 37 | 126011.2 | 17982.46 | -17953.84 |
| 4 | 48 | 68680.25 | 15788.08 | -75284.75 |
| 5 | 18 | 438332.8 | 25781.83 | 294367.8 |
| 6 | 33 | 91018.85 | 19041.15 | -52946.15 |
| 7 | 39 | 98976.38 | 17515.31 | -44988.62 |

**Kruskal-Wallis Multiple-Comparison Z-Value Test**

| Extrev | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| 1 | 0.0000 | 2.2040 | 0.3972 | 3.2467 | 4.7429 |
| 2 | 2.2040 | 0.0000 | 2.4293 | 1.0150 | 6.3188 |
| 3 | 0.3972 | 2.4293 | 0.0000 | 3.3926 | 4.2369 |
| 4 | 3.2467 | 1.0150 | 3.3926 | 0.0000 | 7.0907 |
| 5 | 4.7429 | 6.3188 | 4.2369 | 7.0907 | 0.0000 |
| 6 | 1.4095 | 0.5797 | 1.6800 | 1.5033 | 5.5281 |
| 7 | 0.0696 | 1.9986 | 0.4402 | 2.9743 | 4.6274 |

Regular Test: Medians significantly different if z-value > 1.4395
Bonferroni Test: Medians significantly different if z-value > 2.6901

**Kruskal-Wallis Multiple-Comparison Z-Value Test**

| Extrev | 6 | 7 |
|---|---|---|
| 1 | 1.4095 | 0.0696 |
| 2 | 0.5797 | 1.9986 |
| 3 | 1.6800 | 0.4402 |
| 4 | 1.5033 | 2.9743 |
| 5 | 5.5281 | 4.6274 |
| 6 | 0.0000 | 1.2736 |
| 7 | 1.2736 | 0.0000 |

Regular Test: Medians significantly different if z-value > 1.4395
Bonferroni Test: Medians significantly different if z-value > 2.6901

Response SerExp

**Tests of Assumptions Section**

| Assumption | Test Value | Prob Level | Decision (0.05) |
|---|---|---|---|
| Skewness Normality of Residuals | 11.7183 | 0.000000 | Reject |
| Kurtosis Normality of Residuals | 9.3151 | 0.000000 | Reject |
| Omnibus Normality of Residuals | 224.0885 | 0.000000 | Reject |
| Modified-Levene Equal-Variance Test | 7.9644 | 0.000000 | Reject |

**Expected Mean Squares Section**

| Source Term | DF | Term Fixed? | Denominator Term | Expected Mean Square |
|---|---|---|---|---|
| A: Cluster | 6 | Yes | S(A) | S+sA |
| S(A) | 265 | No | | S(A) |

Note: Expected Mean Squares are for the balanced cell-frequency case.

**Analysis of Variance Table**

| Source Term | DF | Sum of Squares | Mean Square | F-Ratio | Prob Level | Power (Alpha=0.05) |
|---|---|---|---|---|---|---|
| A: Cluster | 6 | 1.302156E+10 | 2.17026E+09 | 15.74 | 0.000000* | 1.000000 |
| S(A) | 265 | 3.652846E+10 | 1.378432E+08 | | | |
| Total (Adjusted) | 271 | 4.955002E+10 | | | | |
| Total | 272 | | | | | |

* Term significant at alpha = 0.05

**Kruskal-Wallis One-Way ANOVA on Ranks**
**Hypotheses**
Ho: All medians are equal.
Ha: At least two medians are different.

**Test Results**

| Method | DF | Chi-Square (H) | Prob Level | Decision(0.05) |
|---|---|---|---|---|
| Not Corrected for Ties | 6 | 44.20516 | 0.000000 | Reject Ho |
| Corrected for Ties | 6 | 44.20682 | 0.000000 | Reject Ho |

| | |
|---|---|
| Number Sets of Ties | 87 |
| Multiplicity Factor | 756 |

**Group Detail**

| Group | Count | Sum of Ranks | Mean Rank | Z-Value | Median |
|---|---|---|---|---|---|
| 1 | 50 | 6778.50 | 135.57 | -0.0925 | 8599.5 |
| 2 | 47 | 4806.50 | 102.27 | -3.2804 | 4989 |
| 3 | 37 | 4522.00 | 122.22 | -1.1883 | 8027 |
| 4 | 48 | 5496.00 | 114.50 | -2.1352 | 5157 |
| 5 | 18 | 4116.00 | 228.67 | 5.1440 | 25181 |
| 6 | 33 | 5245.00 | 158.94 | 1.7481 | 9413 |
| 7 | 39 | 6164.00 | 158.05 | 1.8486 | 10210 |

Response SerExp

**Means and Effects Section**

| Term | Count | Mean | Standard Error | Effect |
|---|---|---|---|---|
| All | 272 | 11370.89 | | 13595.13 |
| A: Cluster | | | | |
| 1 | 50 | 9412.24 | 1660.381 | -4182.892 |
| 2 | 47 | 5980.702 | 1712.552 | -7614.43 |
| 3 | 37 | 8472.703 | 1930.154 | -5122.429 |
| 4 | 48 | 9014.833 | 1694.619 | -4580.298 |
| 5 | 18 | 35537 | 2767.302 | 21941.87 |
| 6 | 33 | 14646.73 | 2043.788 | 1051.595 |
| 7 | 39 | 12101.72 | 1880.011 | -1493.414 |

**Kruskal-Wallis Multiple-Comparison Z-Value Test**

| SerExp | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| 1 | 0.0000 | 2.0839 | 0.7828 | 1.3255 | 4.3056 |
| 2 | 2.0839 | 0.0000 | 1.1540 | 0.7579 | 5.7971 |
| 3 | 0.7828 | 1.1540 | 0.0000 | 0.4484 | 4.7091 |
| 4 | 1.3255 | 0.7579 | 0.4484 | 0.0000 | 5.2512 |
| 5 | 4.3056 | 5.7971 | 4.7091 | 5.2512 | 0.0000 |
| 6 | 1.3246 | 3.1723 | 1.9498 | 2.4983 | 3.0251 |
| 7 | 1.3378 | 3.2740 | 1.9850 | 2.5682 | 3.1504 |

Regular Test: Medians significantly different if z-value > 1.4395
Bonferroni Test: Medians significantly different if z-value > 2.6901

**Kruskal-Wallis Multiple-Comparison Z-Value Test**

| SerExp | 6 | 7 |
|---|---|---|
| 1 | 1.3246 | 1.3378 |
| 2 | 3.1723 | 3.2740 |
| 3 | 1.9498 | 1.9850 |
| 4 | 2.4983 | 2.5682 |
| 5 | 3.0251 | 3.1504 |
| 6 | 0.0000 | 0.0477 |
| 7 | 0.0477 | 0.0000 |

Regular Test: Medians significantly different if z-value > 1.4395
Bonferroni Test: Medians significantly different if z-value > 2.6901

Response Invest

**Tests of Assumptions Section**

| Assumption | Test Value | Prob Level | Decision (0.05) |
|---|---|---|---|
| Skewness Normality of Residuals | 12.3854 | 0.000000 | Reject |
| Kurtosis Normality of Residuals | 9.7623 | 0.000000 | Reject |
| Omnibus Normality of Residuals | 248.7021 | 0.000000 | Reject |
| Modified-Levene Equal-Variance Test | 7.0472 | 0.000001 | Reject |

**Expected Mean Squares Section**

| Source Term | DF | Term Fixed? | Denominator Term | Expected Mean Square |
|---|---|---|---|---|
| A: Cluster | 6 | Yes | S(A) | S+sA |
| S(A) | 265 | No | | S(A) |

Note: Expected Mean Squares are for the balanced cell-frequency case.

**Analysis of Variance Table**

| Source Term | DF | Sum of Squares | Mean Square | F-Ratio | Prob Level | Power (Alpha=0.05) |
|---|---|---|---|---|---|---|
| A: Cluster | 6 | 2.138927E+12 | 3.564878E+11 | 29.17 | 0.000000* | 1.000000 |
| S(A) | 265 | 3.23906E+12 | 1.222287E+10 | | | |
| Total (Adjusted) | 271 | 5.377986E+12 | | | | |
| Total | 272 | | | | | |

* Term significant at alpha = 0.05

**Kruskal-Wallis One-Way ANOVA on Ranks**
**Hypotheses**
Ho: All medians are equal.
Ha: At least two medians are different.

**Test Results**

| Method | DF | Chi-Square (H) | Prob Level | Decision(0.05) |
|---|---|---|---|---|
| Not Corrected for Ties | 6 | 58.09122 | 0.000000 | Reject Ho |
| Corrected for Ties | 6 | 58.0934 | 0.000000 | Reject Ho |

| | |
|---|---|
| Number Sets of Ties | 87 |
| Multiplicity Factor | 756 |

**Group Detail**

| Group | Count | Sum of Ranks | Mean Rank | Z-Value | Median |
|---|---|---|---|---|---|
| 1 | 50 | 7205.50 | 144.11 | 0.7572 | 113182.5 |
| 2 | 47 | 4767.50 | 101.44 | -3.3599 | 52624 |
| 3 | 37 | 5064.00 | 136.86 | 0.0304 | 81388 |
| 4 | 48 | 5196.00 | 108.25 | -2.7417 | 61923 |
| 5 | 18 | 4607.00 | 255.94 | 6.6665 | 333127.5 |
| 6 | 33 | 4601.00 | 139.42 | 0.2278 | 94393 |
| 7 | 39 | 5687.00 | 145.82 | 0.7995 | 113479 |

Response Invest

**Means and Effects Section**

| Term | Count | Mean | Standard Error | Effect |
|---|---|---|---|---|
| All | 272 | 126172.2 | | 154149.3 |
| A: Cluster | | | | |
| 1 | 50 | 118246.9 | 15635.13 | -35902.39 |
| 2 | 47 | 73663.21 | 16126.41 | -80486.04 |
| 3 | 37 | 120808.5 | 18175.47 | -33340.8 |
| 4 | 48 | 85608.59 | 15957.54 | -68540.67 |
| 5 | 18 | 452413.7 | 26058.55 | 298264.4 |
| 6 | 33 | 113685.2 | 19245.52 | -40464.07 |
| 7 | 39 | 114618.8 | 17703.3 | -39530.43 |

**Kruskal-Wallis Multiple-Comparison Z-Value Test**

| Invest | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| 1 | 0.0000 | 2.6702 | 0.4247 | 2.2560 | 5.1722 |
| 2 | 2.6702 | 0.0000 | 2.0493 | 0.4221 | 7.0862 |
| 3 | 0.4247 | 2.0493 | 0.0000 | 1.6628 | 5.2678 |
| 4 | 2.2560 | 0.4221 | 1.6628 | 0.0000 | 6.7933 |
| 5 | 5.1722 | 7.0862 | 5.2678 | 6.7933 | 0.0000 |
| 6 | 0.2656 | 2.1264 | 0.1359 | 1.7525 | 5.0552 |
| 7 | 0.1018 | 2.6049 | 0.4961 | 2.2155 | 4.9130 |

Regular Test: Medians significantly different if z-value > 1.4395
Bonferroni Test: Medians significantly different if z-value > 2.6901

**Kruskal-Wallis Multiple-Comparison Z-Value Test**

| Invest | 6 | 7 |
|---|---|---|
| 1 | 0.2656 | 0.1018 |
| 2 | 2.1264 | 2.6049 |
| 3 | 0.1359 | 0.4961 |
| 4 | 1.7525 | 2.2155 |
| 5 | 5.0552 | 4.9130 |
| 6 | 0.0000 | 0.3438 |
| 7 | 0.3438 | 0.0000 |

Regular Test: Medians significantly different if z-value > 1.4395
Bonferroni Test: Medians significantly different if z-value > 2.6901

Response Index

**Tests of Assumptions Section**

| Assumption | Test Value | Prob Level | Decision (0.05) |
|---|---|---|---|
| Skewness Normality of Residuals | 8.0618 | 0.000000 | Reject |
| Kurtosis Normality of Residuals | 6.1019 | 0.000000 | Reject |
| Omnibus Normality of Residuals | 102.2252 | 0.000000 | Reject |
| Modified-Levene Equal-Variance Test | 2.8671 | 0.010079 | Reject |

**Expected Mean Squares Section**

| Source Term | DF | Term Fixed? | Denominator Term | Expected Mean Square |
|---|---|---|---|---|
| A: Cluster | 6 | Yes | S(A) | S+sA |
| S(A) | 265 | No | | S(A) |

Note: Expected Mean Squares are for the balanced cell-frequency case.

**Analysis of Variance Table**

| Source Term | DF | Sum of Squares | Mean Square | F-Ratio | Prob Level | Power (Alpha=0.05) |
|---|---|---|---|---|---|---|
| A: Cluster | 6 | 57377.45 | 9562.909 | 33.98 | 0.000000* | 1.000000 |
| S(A) | 265 | 74579.76 | 281.433 | | | |
| Total (Adjusted) | 271 | 131957.2 | | | | |
| Total | 272 | | | | | |

* Term significant at alpha = 0.05

**Kruskal-Wallis One-Way ANOVA on Ranks**
**Hypotheses**
Ho: All medians are equal.
Ha: At least two medians are different.

**Test Results**

| Method | DF | Chi-Square (H) | Prob Level | Decision(0.05) |
|---|---|---|---|---|
| Not Corrected for Ties | 6 | 148.0753 | 0.000000 | Reject Ho |
| Corrected for Ties | 6 | 148.0858 | 0.000000 | Reject Ho |

| | |
|---|---|
| Number Sets of Ties | 85 |
| Multiplicity Factor | 1428 |

**Group Detail**

| Group | Count | Sum of Ranks | Mean Rank | Z-Value | Median |
|---|---|---|---|---|---|
| 1 | 50 | 4454.50 | 89.09 | -4.7172 | 66.95 |
| 2 | 47 | 8052.50 | 171.33 | 3.3375 | 82.4 |
| 3 | 37 | 1864.00 | 50.38 | -7.1645 | 59.5 |
| 4 | 48 | 4844.50 | 100.93 | -3.4524 | 69.15 |
| 5 | 18 | 2660.50 | 147.81 | 0.6310 | 73 |
| 6 | 33 | 6870.00 | 208.18 | 5.5844 | 90.3 |
| 7 | 39 | 8382.00 | 214.92 | 6.7268 | 90.5 |

Response Index

**Means and Effects Section**

| Term | Count | Mean | Standard Error | Effect |
|---|---|---|---|---|
| All | 272 | 77.35662 | | 78.45712 |
| A: Cluster | | | | |
| 1 | 50 | 65.974 | 2.37248 | -12.48312 |
| 2 | 47 | 83.44255 | 2.447026 | 4.985434 |
| 3 | 37 | 56.78378 | 2.757952 | -21.67334 |
| 4 | 48 | 67.97708 | 2.421402 | -10.48004 |
| 5 | 18 | 79.96111 | 3.954133 | 1.503992 |
| 6 | 33 | 98.34849 | 2.920321 | 19.89137 |
| 7 | 39 | 96.71282 | 2.686305 | 18.2557 |

**Kruskal-Wallis Multiple-Comparison Z-Value Test**

| Index | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| 1 | 0.0000 | 5.1460 | 2.2694 | 0.7447 | 2.7156 |
| 2 | 5.1460 | 0.0000 | 6.9962 | 4.3615 | 1.0789 |
| 3 | 2.2694 | 6.9962 | 0.0000 | 2.9374 | 4.3100 |
| 4 | 0.7447 | 4.3615 | 2.9374 | 0.0000 | 2.1562 |
| 5 | 2.7156 | 1.0789 | 4.3100 | 2.1562 | 0.0000 |
| 6 | 6.7503 | 2.0628 | 8.3785 | 6.0296 | 2.6195 |
| 7 | 7.4879 | 2.5585 | 9.1149 | 6.7224 | 2.9944 |

Regular Test: Medians significantly different if z-value > 1.4395
Bonferroni Test: Medians significantly different if z-value > 2.6901

**Kruskal-Wallis Multiple-Comparison Z-Value Test**

| Index | 6 | 7 |
|---|---|---|
| 1 | 6.7503 | 7.4879 |
| 2 | 2.0628 | 2.5585 |
| 3 | 8.3785 | 9.1149 |
| 4 | 6.0296 | 6.7224 |
| 5 | 2.6195 | 2.9944 |
| 6 | 0.0000 | 0.3623 |
| 7 | 0.3623 | 0.0000 |

Regular Test: Medians significantly different if z-value > 1.4395
Bonferroni Test: Medians significantly different if z-value > 2.6901

# Appendix A4.8

Cluster 1 DEA Data

| Sr_Number | ACTHOUS_OP | AVGHOUSE_OP | STRAR_OP | HEAVY_OP | AVGINDU_OP | TOURIST_OP | WAGES_IP | REPMAIN_IP |
|---|---|---|---|---|---|---|---|---|
| 1 | 10907 | 66.8 | 3105 | 74378 | 70.2 | 0 | 131422 | 135096 |
| 2 | 19221.2 | 70.6 | 4820 | 250296 | 91.3 | 0 | 179748 | 144551 |
| 4 | 3438.5 | 63.1 | 1058 | 10886 | 67.9 | 1 | 49604 | 52348 |
| 7 | 14086.2 | 61.3 | 8500 | 68020 | 59.8 | 0 | 145540 | 33406 |
| 9 | 1655 | 54.3 | 2800 | 5189 | 43.6 | 0 | 22998 | 5321 |
| 10 | 4091.5 | 82.4 | 7600 | 21261 | 58.6 | 0 | 27672 | 18985 |
| 11 | 13220.7 | 82.5 | 11000 | 39263 | 48 | 0 | 134508 | 18576 |
| 12 | 11785 | 81.6 | 5789 | 53013 | 95.2 | 0 | 158098 | 14262 |
| 14 | 5501.2 | 59.3 | 5800 | 17864 | 28.8 | 0 | 68338 | 17381 |
| 15 | 21346.8 | 84.2 | 7793 | 86370 | 96 | 0 | 259088 | 68947 |
| 18 | 2463.7 | 93.2 | 2282 | 8308 | 55.6 | 0 | 37858 | 7401 |
| 24 | 1673 | 70.6 | 1633 | 12664 | 43.6 | 0 | 15371 | 18986 |
| 29 | 13984.2 | 69 | 8500 | 77627 | 59.5 | 0 | 148774 | 57114 |
| 37 | 4625.2 | 63.8 | 1725 | 33489 | 80.1 | 0 | 117110 | 38867 |
| 39 | 28084.5 | 62 | 5607 | 310597 | 85.8 | 0 | 372104 | 290765 |
| 40 | 1389 | 87.2 | 4300 | 7150 | 40.3 | 0 | 22422 | 3786 |
| 41 | 7416 | 68.1 | 5200 | 28904 | 56.6 | 0 | 94066 | 31467 |
| 42 | 2384.2 | 66.5 | 3300 | 17943 | 46.9 | 0 | 32209 | 5014 |
| 49 | 21379.3 | 65.7 | 4000 | 66416 | 68.2 | 0 | 184696 | 32492 |
| 51 | 1332.8 | 71.6 | 3700 | 5809 | 32.9 | 0 | 11303 | 3887 |
| 52 | 7925.2 | 75.8 | 6000 | 32729 | 43 | 0 | 71014 | 25476 |
| 59 | 23243 | 60.9 | 6856 | 56894 | 52.1 | 0 | 252517 | 87420 |
| 62 | 1947.8 | 82.8 | 1800 | 13684 | 51.6 | 0 | 26644 | 22680 |
| 68 | 5378.8 | 73 | 4800 | 21790 | 63.3 | 1 | 123840 | 103567 |
| 75 | 14777.8 | 81.2 | 10000 | 78686 | 51.4 | 0 | 166916 | 75689 |
| 80 | 14152.3 | 111.6 | 10937 | 69959 | 84.7 | 0 | 213045 | 30337 |
| 87 | 2095.8 | 65.4 | 2457 | 12772 | 34.7 | 0 | 22969 | 15412 |
| 91 | 16860.8 | 55.9 | 5500 | 56728 | 53.3 | 0 | 160315 | 76669 |
| 93 | 4493.5 | 54.6 | 2800 | 10265 | 55.2 | 0 | 67587 | 25371 |
| 96 | 2567.2 | 49.1 | 4500 | 2254 | 42.3 | 1 | 17786 | 22978 |
| 99 | 8992.3 | 64.1 | 11750 | 28127 | 46 | 0 | 53781 | 20690 |
| 103 | 6485.7 | 65.4 | 3700 | 255946 | 188.7 | 0 | 97340 | 32345 |
| 107 | 4179.3 | 105.1 | 3380 | 6814 | 53.8 | 0 | 62221 | 10554 |
| 111 | 23256.3 | 72.8 | 7816 | 158131 | 67 | 0 | 204270 | 170419 |
| 113 | 29573.2 | 74.2 | 3500 | 39328 | 65 | 0 | 245751 | 40848 |
| 115 | 4241 | 70.7 | 5000 | 13828 | 43 | 0 | 38929 | 7655 |
| 116 | 4145.7 | 69.8 | 3770 | 13724 | 66.9 | 0 | 64010 | 9299 |
| 117 | 6556.8 | 77.6 | 5100 | 26041 | 38.7 | 0 | 88301 | 47654 |
| 123 | 24954.5 | 79.7 | 4246 | 48275 | 69.4 | 0 | 318221 | 47291 |
| 132 | 5644.5 | 88 | 2076 | 19335 | 75.6 | 0 | 45348 | 33101 |
| 135 | 8154.7 | 56.2 | 12000 | 37387 | 50.4 | 0 | 82763 | 21343 |
| 137 | 8163.5 | 73.3 | 2520 | 54436 | 64.2 | 0 | 79697 | 16983 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 139 | 1653.3 | 60.5 | 900 | 3959 | 16.6 | 0 | 13930 | 25746 |
| 141 | 8560 | 67.4 | 1500 | 34587 | 56.9 | 1 | 110916 | 71440 |
| 146 | 18421.2 | 66.4 | 8200 | 47855 | 37.5 | 0 | 184061 | 62576 |
| 158 | 5873 | 76 | 2200 | 34292 | 56.3 | 0 | 96801 | 31239 |
| 161 | 16901.7 | 72.3 | 14300 | 82446 | 56.2 | 0 | 211174 | 51758 |
| 162 | 9215.8 | 70.6 | 8000 | 25602 | 43.9 | 0 | 106057 | 42826 |
| 164 | 23707 | 82.8 | 9355 | 60956 | 70.8 | 0 | 224886 | 30703 |
| 172 | 36664.8 | 63 | 4187 | 57359 | 56.8 | 0 | 381884 | 104092 |

Cluster 2 DEA data

| Sr_Number | ACTHOUS_OP | AVGHOUSE_OP | STRAR_OP | HEAVY_OP | AVGINDU_OP | TOURIST_OP | WAGES_IP | REPMAIN_IP |
|---|---|---|---|---|---|---|---|---|
| 4 | 3438.5 | 63.1 | 1058 | 10886 | 67.9 | 1 | 49604 | 52348 |
| 8 | 3578.8 | 50.6 | 5850 | 2998 | 44.6 | 1 | 47035 | 31894 |
| 12 | 11785 | 81.6 | 5789 | 53013 | 95.2 | 0 | 158098 | 14262 |
| 17 | 1590.3 | 71.9 | 1000 | 5251 | 50.7 | 0 | 19433 | 5657 |
| 20 | 10692.2 | 73.8 | 3000 | 102901 | 91.6 | 0 | 129673 | 46787 |
| 22 | 2840.7 | 73.2 | 4500 | 10897 | 69.3 | 1 | 60273 | 40951 |
| 25 | 7667 | 64.6 | 8830 | 32603 | 63.1 | 0 | 109059 | 22121 |
| 33 | 9916.2 | 63.3 | 1375 | 45278 | 45.8 | 0 | 95861 | 39141 |
| 34 | 2655.7 | 73.2 | 2200 | 11352 | 47.9 | 0 | 32289 | 16726 |
| 37 | 4625.2 | 63.8 | 1725 | 33489 | 80.1 | 0 | 117110 | 38867 |
| 38 | 6242.5 | 73.5 | 2400 | 17506 | 43.9 | 0 | 69603 | 13867 |
| 40 | 1389 | 87.2 | 4300 | 7150 | 40.3 | 0 | 22422 | 3786 |
| 42 | 2384.2 | 66.5 | 3300 | 17943 | 46.9 | 0 | 32209 | 5014 |
| 45 | 5114.7 | 60.7 | 3200 | 17171 | 52.2 | 1 | 119529 | 59542 |
| 46 | 2524.7 | 76.2 | 2200 | 9177 | 50.5 | 0 | 39907 | 14576 |
| 52 | 7925.2 | 75.8 | 6000 | 32729 | 43 | 0 | 71014 | 25476 |
| 54 | 3713.7 | 55.3 | 2460 | 10671 | 32.4 | 0 | 26747 | 11381 |
| 55 | 4397.7 | 64.8 | 2600 | 20654 | 46.5 | 1 | 37407 | 27229 |
| 58 | 4650 | 66.9 | 975 | 13949 | 49.4 | 0 | 77272 | 8363 |
| 73 | 2139.2 | 53.5 | 5000 | 5573 | 46.6 | 0 | 17689 | 87351 |
| 75 | 14777.8 | 81.2 | 10000 | 78686 | 51.4 | 0 | 166916 | 75689 |
| 79 | 3924 | 74.9 | 1700 | 18450 | 55 | 1 | 35803 | 8252 |
| 80 | 14152.3 | 111.6 | 10937 | 69959 | 84.7 | 0 | 213045 | 30337 |
| 81 | 4396.3 | 73.1 | 5000 | 27588 | 59.8 | 0 | 16913 | 2458 |
| 83 | 4882.8 | 59.6 | 20500 | 14691 | 67.8 | 1 | 125939 | 41137 |
| 95 | 6588.8 | 53.8 | 7900 | 25437 | 49.3 | 0 | 74361 | 15948 |
| 96 | 2567.2 | 49.1 | 4500 | 2254 | 42.3 | 1 | 17786 | 22978 |
| 98 | 3659.3 | 67.1 | 2500 | 184302 | 312.8 | 0 | 71992 | 42985 |
| 103 | 6485.7 | 65.4 | 3700 | 255946 | 188.7 | 0 | 97340 | 32345 |
| 106 | 8225.2 | 66.7 | 2300 | 291499 | 172.2 | 0 | 124273 | 22580 |
| 112 | 4576.7 | 89.6 | 1000 | 13024 | 81.4 | 0 | 54531 | 33750 |
| 113 | 29573.2 | 74.2 | 3500 | 39328 | 65 | 0 | 245751 | 40848 |
| 114 | 4082.7 | 71 | 770 | 35688 | 123.3 | 0 | 55655 | 12546 |
| 116 | 4145.7 | 69.8 | 3770 | 13724 | 66.9 | 0 | 64010 | 9299 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 124 | 4362.8 | 140.8 | 2546 | 363 | 205.2 | 0 | 93527 | 11449 |
| 126 | 1586 | 90.3 | 4793 | 7644 | 41.3 | 0 | 18838 | 28502 |
| 129 | 7395.3 | 67.5 | 3000 | 88999 | 104.1 | 0 | 112463 | 14285 |
| 132 | 5644.5 | 88 | 2076 | 19335 | 75.6 | 0 | 45348 | 33101 |
| 135 | 8154.7 | 56.2 | 12000 | 37387 | 50.4 | 0 | 82763 | 21343 |
| 139 | 1653.3 | 60.5 | 900 | 3959 | 16.6 | 0 | 13930 | 25746 |
| 140 | 8889.5 | 80.1 | 4200 | 21422 | 53.9 | 0 | 94709 | 32506 |
| 145 | 1272.3 | 40.9 | 2500 | 2354 | 25.2 | 0 | 17303 | 2000 |
| 147 | 1820.8 | 73.1 | 2500 | 28208 | 43.3 | 0 | 17274 | 5328 |
| 149 | 3091.8 | 76.3 | 602 | 13625 | 64.2 | 1 | 26776 | 31153 |
| 150 | 1382.2 | 70.8 | 2500 | 11429 | 39.9 | 0 | 16105 | 10141 |
| 151 | 1724 | 69.8 | 3300 | 10666 | 55.6 | 0 | 24787 | 9457 |
| 171 | 3705 | 66.4 | 4267 | 11594 | 53.3 | 1 | 58078 | 17285 |

Cluster 3 DEA Data

| Sr_Number | ACTHOUS_OP | AVGHOUSE_OP | STRAR_OP | HEAVY_OP | AVGINDU_OP | TOURIST_OP | WAGES_IP | REPMAIN_IP |
|---|---|---|---|---|---|---|---|---|
| 1 | 10907 | 66.8 | 3105 | 74378 | 70.2 | 0 | 131422 | 135096 |
| 2 | 19221.2 | 70.6 | 4820 | 250296 | 91.3 | 0 | 179748 | 144551 |
| 7 | 14086.2 | 61.3 | 8500 | 68020 | 59.8 | 0 | 145540 | 33406 |
| 9 | 1655 | 54.3 | 2800 | 5189 | 43.6 | 0 | 22998 | 5321 |
| 10 | 4091.5 | 82.4 | 7600 | 21261 | 58.6 | 0 | 27672 | 18985 |
| 11 | 13220.7 | 82.5 | 11000 | 39263 | 48 | 0 | 134508 | 18576 |
| 13 | 2427.8 | 79.8 | 12900 | 11599 | 34.4 | 0 | 32113 | 19786 |
| 14 | 5501.2 | 59.3 | 5800 | 17864 | 28.8 | 0 | 68338 | 17381 |
| 18 | 2463.7 | 93.2 | 2282 | 8308 | 55.6 | 0 | 37858 | 7401 |
| 24 | 1673 | 70.6 | 1633 | 12664 | 43.6 | 0 | 15371 | 18986 |
| 29 | 13984.2 | 69 | 8500 | 77627 | 59.5 | 0 | 148774 | 57114 |
| 40 | 1389 | 87.2 | 4300 | 7150 | 40.3 | 0 | 22422 | 3786 |
| 41 | 7416 | 68.1 | 5200 | 28904 | 56.6 | 0 | 94066 | 31467 |
| 44 | 1740.7 | 70 | 1420 | 7135 | 32.1 | 0 | 20206 | 8937 |
| 47 | 2011 | 77.5 | 5400 | 4680 | 24.2 | 0 | 27362 | 46870 |
| 51 | 1332.8 | 71.6 | 3700 | 5809 | 32.9 | 0 | 11303 | 3887 |
| 56 | 2669.8 | 73.6 | 2100 | 7361 | 58.2 | 0 | 32802 | 3317 |
| 59 | 23243 | 60.9 | 6856 | 56894 | 52.1 | 0 | 252517 | 87420 |
| 62 | 1947.8 | 82.8 | 1800 | 13684 | 51.6 | 0 | 26644 | 22680 |
| 68 | 5378.8 | 73 | 4800 | 21790 | 63.3 | 1 | 123840 | 103567 |
| 72 | 2187 | 88.7 | 3050 | 26000 | 94.6 | 1 | 17178 | 4025 |
| 87 | 2095.8 | 65.4 | 2457 | 12772 | 34.7 | 0 | 22969 | 15412 |
| 91 | 16860.8 | 55.9 | 5500 | 56728 | 53.3 | 0 | 160315 | 76669 |
| 93 | 4493.5 | 54.6 | 2800 | 10265 | 55.2 | 0 | 67587 | 25371 |
| 99 | 8992.3 | 64.1 | 11750 | 28127 | 46 | 0 | 53781 | 20690 |
| 100 | 1952.2 | 70.5 | 3000 | 3597 | 59.3 | 0 | 24148 | 9866 |
| 107 | 4179.3 | 105.1 | 3380 | 6814 | 53.8 | 0 | 62221 | 10554 |
| 111 | 23256.3 | 72.8 | 7816 | 158131 | 67 | 0 | 204270 | 170419 |
| 115 | 4241 | 70.7 | 5000 | 13828 | 43 | 0 | 38929 | 7655 |
| 130 | 48534.8 | 66.3 | 10071 | 566183 | 81.6 | 0 | 570801 | 110101 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 132 | 5644.5 | 88 | 2076 | 19335 | 75.6 | 0 | 45348 | 33101 |
| 141 | 8560 | 67.4 | 1500 | 34587 | 56.9 | 1 | 110916 | 71440 |
| 143 | 11456.7 | 63.9 | 13423 | 10644 | 38.5 | 1 | 79196 | 27651 |
| 146 | 18421.2 | 66.4 | 8200 | 47855 | 37.5 | 0 | 184061 | 62576 |
| 158 | 5873 | 76 | 2200 | 34292 | 56.3 | 0 | 96801 | 31239 |
| 161 | 16901.7 | 72.3 | 14300 | 82446 | 56.2 | 0 | 211174 | 51758 |
| 172 | 36664.8 | 63 | 4187 | 57359 | 56.8 | 0 | 381884 | 104092 |

Cluster 4 DEA Data

| Sr_Number | ACTHOUS_OP | AVGHOUSE_OP | STRAR_OP | HEAVY_OP | AVGINDU_OP | TOURIST_OP | WAGES_IP | REPMAIN_IP |
|---|---|---|---|---|---|---|---|---|
| 6 | 9614 | 64.4 | 1800 | 37446 | 49.7 | 0 | 93032 | 196785 |
| 16 | 15208.2 | 64.9 | 1803 | 84866 | 63.5 | 0 | 123466 | 93005 |
| 19 | 5508 | 77.1 | 9000 | 100809 | 121.6 | 0 | 111698 | 112094 |
| 21 | 2285.5 | 76.6 | 1000 | 26877 | 150.7 | 0 | 16743 | 17917 |
| 26 | 4211.2 | 61.4 | 5660 | 913084 | 527.2 | 0 | 115716 | 16706 |
| 31 | 7060 | 96.2 | 9003 | 3675 | 51.2 | 1 | 103832 | 11723 |
| 32 | 23866 | 63.4 | 5024 | 66742 | 49.5 | 0 | 296472 | 39006 |
| 35 | 1935.3 | 46 | 3500 | 9564 | 47.4 | 0 | 13861 | 17918 |
| 50 | 2205.8 | 52.3 | 6250 | 5524 | 28.1 | 1 | 16943 | 7872 |
| 53 | 22920.8 | 84.3 | 23750 | 52959 | 77.4 | 1 | 285695 | 51512 |
| 57 | 27376.5 | 70.3 | 7000 | 103925 | 63.1 | 0 | 269818 | 40419 |
| 64 | 11605.2 | 60.6 | 1200 | 31746 | 55.6 | 0 | 156478 | 17215 |
| 67 | 2216.8 | 77.8 | 3200 | 7298 | 54.7 | 0 | 21451 | 3792 |
| 70 | 5214.5 | 66 | 5000 | 68186 | 98.7 | 0 | 51720 | 23367 |
| 71 | 10739.7 | 80.1 | 10555 | 50442 | 51.4 | 0 | 138607 | 37795 |
| 76 | 4791.7 | 65 | 6000 | 14377 | 37.3 | 0 | 31058 | 15043 |
| 77 | 25558.3 | 65.6 | 4900 | 126660 | 74.6 | 0 | 239886 | 72348 |
| 82 | 1920 | 54 | 4984 | 4839 | 29 | 0 | 16799 | 3310 |
| 85 | 21864.8 | 66.2 | 3524 | 59845 | 53.1 | 0 | 190999 | 29242 |
| 88 | 12120.5 | 85.7 | 4500 | 54348 | 94.8 | 0 | 186942 | 293205 |
| 90 | 1920.5 | 67.2 | 3150 | 10494 | 30.8 | 0 | 28729 | 3292 |
| 101 | 8842.7 | 97.7 | 12000 | 78278 | 49.6 | 0 | 105946 | 35273 |
| 104 | 2631.2 | 48.8 | 1900 | 4734 | 56.8 | 1 | 33002 | 42487 |
| 109 | 22490.3 | 62.3 | 4382 | 188849 | 73.7 | 0 | 192092 | 26553 |
| 110 | 9210.7 | 69 | 5500 | 29409 | 48.2 | 0 | 81791 | 31995 |
| 118 | 11691.8 | 66.3 | 918 | 46736 | 36.1 | 0 | 94408 | 19143 |
| 119 | 2116.8 | 57.4 | 2500 | 7985 | 38.9 | 0 | 24494 | 13246 |
| 120 | 32526.8 | 63.4 | 4578 | 143730 | 62.7 | 0 | 308447 | 46452 |
| 121 | 5074.7 | 77.8 | 9000 | 25260 | 51.3 | 0 | 34629 | 11465 |
| 122 | 1664 | 81.5 | 2300 | 8463 | 55.7 | 0 | 20435 | 6223 |
| 125 | 2736.8 | 81.6 | 5000 | 61107 | 97.7 | 0 | 27457 | 6969 |
| 127 | 5042.8 | 117 | 2600 | 1389 | 52.2 | 0 | 64983 | 5827 |
| 128 | 53984.7 | 69.5 | 26000 | 264504 | 82.9 | 0 | 1227553 | 210520 |
| 131 | 15192.7 | 72.6 | 3700 | 38013 | 48.4 | 0 | 81799 | 11976 |
| 133 | 5527.2 | 81.2 | 7300 | 64301 | 89.7 | 0 | 43003 | 9786 |
| 136 | 3464.5 | 64.6 | 3800 | 4804 | 38.6 | 0 | 25335 | 9961 |
| 138 | 5558.7 | 59.6 | 3615 | 15598 | 28.9 | 0 | 71484 | 28404 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 148 | 12471.3 | 69.1 | 3283 | 54758 | 47.9 | 0 | 112044 | 18877 |
| 152 | 5734 | 85.9 | 3000 | 31709 | 61.3 | 0 | 39910 | 13493 |
| 153 | 2139.2 | 96.1 | 5500 | 20840 | 65.4 | 0 | 24364 | 7115 |
| 154 | 12419 | 68.4 | 3425 | 79810 | 61.4 | 0 | 95816 | 30367 |
| 155 | 1799.8 | 62.6 | 900 | 11684 | 56.5 | 0 | 21942 | 5058 |
| 159 | 3155 | 66.8 | 5350 | 9333 | 23.3 | 0 | 35804 | 9628 |
| 160 | 4306.5 | 71.4 | 1475 | 14916 | 34.4 | 0 | 34167 | 12347 |
| 165 | 16961 | 74.5 | 8500 | 56441 | 55.3 | 0 | 269664 | 104341 |
| 166 | 18732.2 | 68.3 | 11100 | 69198 | 51.1 | 1 | 259741 | 55686 |
| 167 | 12702.3 | 73.1 | 3700 | 35702 | 33.8 | 0 | 120952 | 56485 |
| 170 | 2379.7 | 90.3 | 4500 | 9335 | 54.7 | 0 | 23119 | 17015 |

Cluster 5 DEA Data

| Sr_Number | ACTHOUS_OP | AVGHOUSE_OP | STRAR_OP | HEAVY_OP | AVGINDU_OP | TOURIST_OP | WAGES_IP | REPMAIN_IP |
|---|---|---|---|---|---|---|---|---|
| 11 | 13220.7 | 82.5 | 11000 | 39263 | 48 | 0 | 134508 | 18576 |
| 27 | 377929.5 | 63.3 | 38300 | 2194356 | 97.2 | 0 | 3416945 | 908939 |
| 30 | 30003.3 | 59.1 | 8059 | 135316 | 58.2 | 1 | 274345 | 73590 |
| 36 | 14678.8 | 67.9 | 7240 | 50006 | 41 | 0 | 124628 | 37100 |
| 59 | 23243 | 60.9 | 6856 | 56894 | 52.1 | 0 | 252517 | 87420 |
| 61 | 39220.7 | 68.2 | 11200 | 134922 | 49.8 | 1 | 513419 | 116097 |
| 63 | 23060.7 | 79.4 | 8000 | 119856 | 78.9 | 0 | 307931 | 164123 |
| 66 | 16523.3 | 46.3 | 8906 | 67097 | 45.6 | 0 | 184250 | 271238 |
| 77 | 25558.3 | 65.6 | 4900 | 126660 | 74.6 | 0 | 239886 | 72348 |
| 88 | 12120.5 | 85.7 | 4500 | 54348 | 94.8 | 0 | 186942 | 293205 |
| 91 | 16860.8 | 55.9 | 5500 | 56728 | 53.3 | 0 | 160315 | 76669 |
| 92 | 38964.3 | 83 | 34500 | 139364 | 60.5 | 0 | 555930 | 101957 |
| 130 | 48534.8 | 66.3 | 10071 | 566183 | 81.6 | 0 | 570801 | 110101 |
| 131 | 15192.7 | 72.6 | 3700 | 38013 | 48.4 | 0 | 81799 | 11976 |
| 134 | 72947.3 | 65.2 | 10865 | 635191 | 103.1 | 0 | 1611765 | 113865 |
| 142 | 16838.7 | 70.6 | 4400 | 52399 | 52.6 | 1 | 579020 | 429867 |
| 146 | 18421.2 | 66.4 | 8200 | 47855 | 37.5 | 0 | 184061 | 62576 |
| 157 | 163641.2 | 77.2 | 17632 | 980706 | 63.3 | 0 | 1142742 | 782832 |

Cluster 6 DEA Data

| Sr_Number | ACTHOUS_OP | AVGHOUSE_OP | STRAR_OP | HEAVY_OP | AVGINDU_OP | TOURIST_OP | WAGES_IP | REPMAIN_IP |
|---|---|---|---|---|---|---|---|---|
| 16 | 15208.2 | 64.9 | 1803 | 84866 | 63.5 | 0 | 123466 | 93005 |
| 19 | 5508 | 77.1 | 9000 | 100809 | 121.6 | 0 | 111698 | 112094 |
| 23 | 7491.7 | 66.4 | 3900 | 52233 | 41.6 | 0 | 75851 | 32277 |
| 32 | 23866 | 63.4 | 5024 | 66742 | 49.5 | 0 | 296472 | 39006 |
| 43 | 6691.8 | 69.6 | 5900 | 133084 | 154.2 | 0 | 213516 | 50654 |
| 48 | 5106 | 62.8 | 4200 | 16600 | 87.7 | 0 | 45500 | 21345 |
| 57 | 27376.5 | 70.3 | 7000 | 103925 | 63.1 | 0 | 269818 | 40419 |
| 69 | 49376.3 | 63.3 | 4665 | 241894 | 90.1 | 0 | 726651 | 125872 |
| 74 | 6090 | 66.8 | 5000 | 127051 | 55.1 | 0 | 106122 | 25853 |
| 77 | 25558.3 | 65.6 | 4900 | 126660 | 74.6 | 0 | 239886 | 72348 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 78 | 15628 | 57.7 | 13100 | 33166 | 44.2 | 1 | 285507 | 25991 |
| 82 | 1920 | 54 | 4984 | 4839 | 29 | 0 | 16799 | 3310 |
| 89 | 6756.2 | 67 | 27540 | 159329 | 102.2 | 0 | 83159 | 67956 |
| 92 | 38964.3 | 83 | 34500 | 139364 | 60.5 | 0 | 555930 | 101957 |
| 94 | 2482.5 | 69.3 | 1260 | 6336 | 36.6 | 1 | 44373 | 16783 |
| 102 | 3936 | 65.6 | 5800 | 95700 | 163.3 | 0 | 78584 | 16691 |
| 105 | 10995.3 | 58.6 | 3600 | 37212 | 43.4 | 1 | 126140 | 45786 |
| 106 | 8225.2 | 66.7 | 2300 | 291499 | 172.2 | 0 | 124273 | 22580 |
| 108 | 9568 | 67.5 | 2376 | 64032 | 93.2 | 0 | 166399 | 29717 |
| 109 | 22490.3 | 62.3 | 4382 | 188849 | 73.7 | 0 | 192092 | 26553 |
| 118 | 11691.8 | 66.3 | 918 | 46736 | 36.1 | 0 | 94408 | 19143 |
| 119 | 2116.8 | 57.4 | 2500 | 7985 | 38.9 | 0 | 24494 | 13246 |
| 120 | 32526.8 | 63.4 | 4578 | 143730 | 62.7 | 0 | 308447 | 46452 |
| 124 | 4362.8 | 140.8 | 2546 | 363 | 205.2 | 0 | 93527 | 11449 |
| 127 | 5042.8 | 117 | 2600 | 1389 | 52.2 | 0 | 64983 | 5827 |
| 128 | 53984.7 | 69.5 | 26000 | 264504 | 82.9 | 0 | 1227553 | 210520 |
| 144 | 2325.7 | 69 | 800 | 5566 | 71.9 | 1 | 27077 | 18653 |
| 154 | 12419 | 68.4 | 3425 | 79810 | 61.4 | 0 | 95816 | 30367 |
| 156 | 5563.2 | 60.6 | 2080 | 272412 | 211 | 0 | 142087 | 62269 |
| 159 | 3155 | 66.8 | 5350 | 9333 | 23.3 | 0 | 35804 | 9628 |
| 160 | 4306.5 | 71.4 | 1475 | 14916 | 34.4 | 0 | 34167 | 12347 |
| 165 | 16961 | 74.5 | 8500 | 56441 | 55.3 | 0 | 269664 | 104341 |
| 166 | 18732.2 | 68.3 | 11100 | 69198 | 51.1 | 1 | 259741 | 55686 |

Cluster 7 DEA Data

| Sr_Number | ACTHOUS_OP | AVGHOUSE_OP | STRAR_OP | HEAVY_OP | AVGINDU_OP | TOURIST_OP | WAGES_IP | REPMAIN_IP |
|---|---|---|---|---|---|---|---|---|
| 3 | 5427.8 | 61.1 | 3524 | 498763 | 354.5 | 0 | 167614 | 19725 |
| 5 | 16185.2 | 89.1 | 5227 | 33543 | 64.6 | 0 | 162562 | 23774 |
| 15 | 21346.8 | 84.2 | 7793 | 86370 | 96 | 0 | 259088 | 68947 |
| 20 | 10692.2 | 73.8 | 3000 | 102901 | 91.6 | 0 | 129673 | 46787 |
| 22 | 2840.7 | 73.2 | 4500 | 10897 | 69.3 | 1 | 60273 | 40951 |
| 25 | 7667 | 64.6 | 8830 | 32603 | 63.1 | 0 | 109059 | 22121 |
| 28 | 14262.2 | 64.1 | 26369 | 350003 | 127.7 | 0 | 222298 | 185679 |
| 33 | 9916.2 | 63.3 | 1375 | 45278 | 45.8 | 0 | 95861 | 39141 |
| 37 | 4625.2 | 63.8 | 1725 | 33489 | 80.1 | 0 | 117110 | 38867 |
| 38 | 6242.5 | 73.5 | 2400 | 17506 | 43.9 | 0 | 69603 | 13867 |
| 39 | 28084.5 | 62 | 5607 | 310597 | 85.8 | 0 | 372104 | 290765 |
| 45 | 5114.7 | 60.7 | 3200 | 17171 | 52.2 | 1 | 119529 | 59542 |
| 46 | 2524.7 | 76.2 | 2200 | 9177 | 50.5 | 0 | 39907 | 14576 |
| 48 | 5106 | 62.8 | 4200 | 16600 | 87.7 | 0 | 45500 | 21345 |
| 52 | 7925.2 | 75.8 | 6000 | 32729 | 43 | 0 | 71014 | 25476 |
| 60 | 14716.5 | 70.7 | 4482 | 105646 | 85 | 0 | 191188 | 38970 |
| 65 | 26033.7 | 74.9 | 4159 | 94527 | 65.9 | 0 | 245231 | 60314 |
| 74 | 6090 | 66.8 | 5000 | 127051 | 55.1 | 0 | 106122 | 25853 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 78 | 15628 | 57.7 | 13100 | 33166 | 44.2 | 1 | 285507 | 25991 |
| 79 | 3924 | 74.9 | 1700 | 18450 | 55 | 1 | 35803 | 8252 |
| 80 | 14152.3 | 111.6 | 10937 | 69959 | 84.7 | 0 | 213045 | 30337 |
| 81 | 4396.3 | 73.1 | 5000 | 27588 | 59.8 | 0 | 16913 | 2458 |
| 83 | 4882.8 | 59.6 | 20500 | 14691 | 67.8 | 1 | 125939 | 41137 |
| 84 | 12894.3 | 58.8 | 6850 | 30463 | 34.9 | 0 | 204849 | 49598 |
| 86 | 9938.5 | 79.2 | 7080 | 40347 | 65.3 | 1 | 126104 | 50215 |
| 97 | 8473.2 | 49.8 | 10000 | 10286 | 63.9 | 1 | 105341 | 30668 |
| 103 | 6485.7 | 65.4 | 3700 | 255946 | 188.7 | 0 | 97340 | 32345 |
| 106 | 8225.2 | 66.7 | 2300 | 291499 | 172.2 | 0 | 124273 | 22580 |
| 112 | 4576.7 | 89.6 | 1000 | 13024 | 81.4 | 0 | 54531 | 33750 |
| 114 | 4082.7 | 71 | 770 | 35688 | 123.3 | 0 | 55655 | 12546 |
| 123 | 24954.5 | 79.7 | 4246 | 48275 | 69.4 | 0 | 318221 | 47291 |
| 124 | 4362.8 | 140.8 | 2546 | 363 | 205.2 | 0 | 93527 | 11449 |
| 129 | 7395.3 | 67.5 | 3000 | 88999 | 104.1 | 0 | 112463 | 14285 |
| 145 | 1272.3 | 40.9 | 2500 | 2354 | 25.2 | 0 | 17303 | 2000 |
| 147 | 1820.8 | 73.1 | 2500 | 28208 | 43.3 | 0 | 17274 | 5328 |
| 163 | 14189.5 | 67.8 | 11023 | 72762 | 69.2 | 0 | 203354 | 67814 |
| 168 | 9754.2 | 64.6 | 7200 | 30283 | 39.5 | 1 | 81325 | 31265 |
| 169 | 13026.7 | 84.4 | 2496 | 13290 | 72.4 | 0 | 111563 | 12376 |
| 171 | 3705 | 66.4 | 4267 | 11594 | 53.3 | 1 | 58078 | 17285 |

# Appendix A4.9

t-Test: Paired Two Sample for Means

| | *Average Local* | *Global* |
|---|---|---|
| Mean | 79.8315747 | 60.5194328 |
| Variance | 489.1111823 | 658.2936753 |
| Observations | 172 | 172 |
| Pearson Correlation | 0.711254736 | |
| Hypothesized Mean Difference | 0 | |
| df | 171 | |
| t Stat | 13.73124015 | |
| P(T<=t) one-tail | 1.06111E-29 | |
| t Critical one-tail | 1.653813324 | |
| P(T<=t) two-tail | 2.12221E-29 | |
| t Critical two-tail | 1.973933915 | |

T Test comparing the mean efficiency score of the observations in the local context with their efficiency score in the global analysis

# Appendix A 4.10

| DMU | Number of times as a peer in Cluster 1 | Number of times as a peer in Cluster 2 | Number of times as a peer in Cluster 3 | Number of times as a peer in Cluster 4 | Number of times as a peer in Cluster 5 | Number of times as a peer in Cluster 6 | Number of times as a peer in Cluster 7 | Global Peers |
|---|---|---|---|---|---|---|---|---|
| 1 | 0 | | 0 | | | | | 0 |
| 2 | 2 | | 1 | | | | | 0 |
| 3 | | | | | | | 14 | 0 |
| 4 | 1 | 1 | | | | | | 0 |
| 5 | | | | | | | 7 | 0 |
| 6 | | | | 0 | | | | 0 |
| 7 | 0 | | 0 | | | | | 0 |
| 8 | | 0 | | | | | | 0 |
| 9 | 0 | | 0 | | | | | 0 |
| 10 | 4 | | 0 | | | | | 0 |
| 11 | 2 | | 8 | | 6 | | | 4 |
| 12 | 3 | 1 | | | | | | 0 |
| 13 | | | 2 | | | | | 7 |
| 14 | 0 | | 0 | | | | | 0 |
| 15 | 1 | | | | | | 1 | 0 |
| 16 | | | | 0 | | 0 | | 0 |
| 17 | | 0 | | | | | | 0 |
| 18 | 1 | | 0 | | | | | 0 |
| 19 | | | | 0 | | 0 | | 0 |
| 20 | | 0 | | | | | 0 | 0 |
| 21 | | | | 2 | | | | 1 |
| 22 | | 1 | | | | | 1 | 0 |
| 23 | | | | | | 0 | | 0 |
| 24 | 0 | | 0 | | | | | 0 |
| 25 | | 0 | | | | | 0 | 0 |
| 26 | | | | 23 | | | | 66 |
| 27 | | | | | 3 | | | 26 |
| 28 | | | | | | | 1 | 1 |
| 29 | 0 | | 0 | | | | | 0 |
| 30 | | | | | 1 | | | 9 |
| 31 | | | | 1 | | | | 2 |
| 32 | | | | 0 | | 0 | | 0 |
| 33 | | 0 | | | | | 0 | 0 |
| 34 | | 0 | | | | | | 0 |
| 35 | | | | 0 | | | | 0 |
| 36 | | | | | 0 | | | 0 |
| 37 | 0 | 0 | | | | | 0 | 0 |
| 38 | | 0 | | | | | 0 | 0 |
| 39 | 2 | | | | | | 1 | 0 |
| 40 | 8 | 5 | 1 | | | | | 1 |
| 41 | 0 | | 0 | | | | | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 42 | 2 | 0 | | | | | | 0 |
| 43 | | | | | | 0 | | 0 |
| 44 | | | 0 | | | | | 0 |
| 45 | | 1 | | | | | 0 | 0 |
| 46 | | 0 | | | | | 0 | 0 |
| 47 | | | 0 | | | | | 0 |
| 48 | | | | | | 0 | 0 | 0 |
| 49 | 2 | | | | | | | 0 |
| 50 | | | | 1 | | | | 4 |
| 51 | 11 | | 4 | | | | | 21 |
| 52 | 0 | 0 | | | | | 0 | 0 |
| 53 | | | | 8 | | | | 22 |
| 54 | | 0 | | | | | | 0 |
| 55 | | 1 | | | | | | 0 |
| 56 | | | 1 | | | | | 0 |
| 57 | | | | 0 | | 2 | | 0 |
| 58 | | 0 | | | | | | 0 |
| 59 | 0 | | 0 | | 0 | | | 0 |
| 60 | | | | | | | 0 | 0 |
| 61 | | | | | 1 | | | 1 |
| 62 | 0 | | 0 | | | | | 0 |
| 63 | | | | | 0 | | | 0 |
| 64 | | | | 0 | | | | 0 |
| 65 | | | | | | | 4 | 0 |
| 66 | | | | | 0 | | | 0 |
| 67 | | | | 12 | | | | 0 |
| 68 | 1 | | 0 | | | | | 0 |
| 69 | | | | | | 1 | | 0 |
| 70 | | | | 0 | | | | 0 |
| 71 | | | | 0 | | | | 0 |
| 72 | | | 9 | | | | | 42 |
| 73 | | 0 | | | | | | 0 |
| 74 | | | | | | 0 | 0 | 0 |
| 75 | 0 | 0 | | | | | | 0 |
| 76 | | | | 0 | | | | 0 |
| 77 | | | | 0 | 4 | 0 | | 0 |
| 78 | | | | | | 1 | 2 | 0 |
| 79 | | 3 | | | | | 3 | 0 |
| 80 | 2 | 3 | | | | | 3 | 0 |
| 81 | | 25 | | | | | 17 | 80 |
| 82 | | | | 18 | | 13 | | 0 |
| 83 | | 5 | | | | | 8 | 2 |
| 84 | | | | | | | 0 | 0 |
| 85 | | | | 0 | | | | 0 |
| 86 | | | | | | | 1 | 0 |
| 87 | 0 | | 0 | | | | | 0 |
| 88 | | | | 0 | 2 | | | 0 |
| 89 | | | | | | 7 | | 12 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 90 | | | | 0 | | | | 0 |
| 91 | 0 | | 0 | | 0 | | | 0 |
| 92 | | | | | 5 | 4 | | 2 |
| 93 | 0 | | 0 | | | | | 0 |
| 94 | | | | | | 1 | | 0 |
| 95 | | 0 | | | | | | 0 |
| 96 | 1 | 2 | | | | | | 0 |
| 97 | | | | | | | 2 | 0 |
| 98 | | 4 | | | | | | 0 |
| 99 | 16 | | 4 | | | | | 17 |
| 100 | | | 0 | | | | | 0 |
| 101 | | | | 2 | | | | 0 |
| 102 | | | | | | 3 | | 0 |
| 103 | 23 | 2 | | | | | 0 | 0 |
| 104 | | | | 1 | | | | 0 |
| 105 | | | | | | 1 | | 0 |
| 106 | | 6 | | | | 6 | 0 | 0 |
| 107 | 2 | | 2 | | | | | 0 |
| 108 | | | | | | 0 | | 0 |
| 109 | | | | 2 | | 16 | | 8 |
| 110 | | | | 0 | | | | 0 |
| 111 | 0 | | 0 | | | | | 0 |
| 112 | | 0 | | | | | 0 | 0 |
| 113 | 14 | 14 | | | | | | 10 |
| 114 | | 0 | | | | | 0 | 0 |
| 115 | 6 | | 0 | | | | | 0 |
| 116 | 0 | 0 | | | | | | 0 |
| 117 | 0 | | | | | | | 0 |
| 118 | | | | 4 | | 0 | | 0 |
| 119 | | | | 0 | | 0 | | 0 |
| 120 | | | | 8 | | 3 | | 0 |
| 121 | | | | 6 | | | | 7 |
| 122 | | | | 2 | | | | 0 |
| 123 | 0 | | | | | | 1 | 0 |
| 124 | | 12 | | | | 9 | 5 | 16 |
| 125 | | | | 3 | | | | 0 |
| 126 | | 0 | | | | | | 0 |
| 127 | | | | 3 | | 9 | | 15 |
| 128 | | | | 1 | | 1 | | 0 |
| 129 | | 0 | | | | | 0 | 0 |
| 130 | | | 4 | | 5 | | | 0 |
| 131 | | | | 23 | 6 | | | 72 |
| 132 | 0 | 0 | 0 | | | | | 0 |
| 133 | | | | 3 | | | | 5 |
| 134 | | | | | 1 | | | 0 |
| 135 | 1 | 3 | | | | | | 0 |
| 136 | | | | 0 | | | | 0 |
| 137 | 0 | | | | | | | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 138 | | | | 0 | | | | 0 |
| 139 | 0 | 0 | | | | | | 0 |
| 140 | | 0 | | | | | | 0 |
| 141 | 1 | | 1 | | | | | 0 |
| 142 | | | | | 1 | | | 0 |
| 143 | | | 1 | | | | | 29 |
| 144 | | | | | | 1 | | 0 |
| 145 | | 6 | | | | | 1 | 7 |
| 146 | 0 | | 0 | | 0 | | | 0 |
| 147 | | 0 | | | | | 0 | 0 |
| 148 | | | | 0 | | | | 0 |
| 149 | | 1 | | | | | | 0 |
| 150 | | 0 | | | | | | 0 |
| 151 | | 0 | | | | | | 0 |
| 152 | | | | 0 | | | | 0 |
| 153 | | | | 6 | | | | 8 |
| 154 | | | | 0 | | 0 | | 0 |
| 155 | | | | 0 | | | | 0 |
| 156 | | | | | | 1 | | 0 |
| 157 | | | | | 2 | | | 1 |
| 158 | 0 | | 0 | | | | | 0 |
| 159 | | | | 0 | | 0 | | 0 |
| 160 | | | | 0 | | 0 | | 0 |
| 161 | 3 | | 1 | | | | | 0 |
| 162 | 0 | | | | | | | 0 |
| 163 | | | | | | | 0 | 0 |
| 164 | 10 | | | | | | | 10 |
| 165 | | | | 0 | | 0 | | 0 |
| 166 | | | | 0 | | 1 | | 0 |
| 167 | | | | 0 | | | | 0 |
| 168 | | | | | | | 2 | 0 |
| 169 | | | | | | | 11 | 0 |
| 170 | | | | 0 | | | | 0 |
| 171 | | 0 | | | | | 0 | 0 |
| 172 | 1 | | 0 | | | | | 1 |
| Total | 23 | 25 | 9 | 23 | 6 | 16 | 17 | 80 |

# Appendix A4.11

| SrNum | VRS1 | VRS2 | VRS3 | VRS4 | VRS5 | VRS6 | VRS7 |
|---|---|---|---|---|---|---|---|
| 1 | 1.602962 | | 1.793245 | | | | |
| 2 | 1.967323 | | 1.967323 | | | | |
| 3 | | | | | | | 1.741325 |
| 4 | 3.063148 | 3.063148 | | | | | |
| 5 | | | | | | | 1.245808 |
| 6 | | | | 1.146895 | | | |
| 7 | 1.252734 | | 1.350557 | | | | |
| 8 | | 1.820437 | | | | | |
| 9 | 1.58474 | | 1.140022 | | | | |
| 10 | 1.268034 | | 1.213405 | | | | |
| 11 | 1 | | 1 | | 1 | | |
| 12 | 1.333942 | 1.333942 | | | | | |
| 13 | | | 1 | | | | |
| 14 | 1.887889 | | 1.824394 | | | | |
| 15 | 1.693944 | | | | | | 1.693944 |
| 16 | | | | 1.546864 | | 1.472846 | |
| 17 | | 1.007944 | | | | | |
| 18 | 1.616685 | | 1.265962 | | | | |
| 19 | | | | 1.084805 | | 1.557855 | |
| 20 | | 1.572352 | | | | | 1.618342 |
| 21 | | | | 1 | | | |
| 22 | | 3.874816 | | | | | 3.874816 |
| 23 | | | | | | 1.783577 | |
| 24 | 1.385129 | | 1.062738 | | | | |
| 25 | | 1.295511 | | | | | 1.518736 |
| 26 | | | | 1 | | | |
| 27 | | | | | 1 | | |
| 28 | | | | | | | 1 |
| 29 | 1.255756 | | 1.37428 | | | | |
| 30 | | | | | 1 | | |
| 31 | | | | 1 | | | |
| 32 | | | | 1.025362 | | 1.053123 | |
| 33 | | 1.429214 | | | | | 1.56125 |
| 34 | | 1.06595 | | | | | |
| 35 | | | | 1.489355 | | | |
| 36 | | | | | 1.113333 | | |
| 37 | 2.876359 | 1.295426 | | | | | 1.239496 |
| 38 | | 1.235535 | | | | | 1.223519 |
| 39 | 2.536772 | | | | | | 2.536772 |
| 40 | 1 | 1 | 1 | | | | |
| 41 | 1.963401 | | 1.765164 | | | | |
| 42 | 2.001825 | 1 | | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 43 | | | | | | 1.980145 | |
| 44 | | | 1.129246 | | | | |
| 45 | | 3.995942 | | | | | 1.238573 |
| 46 | | 1.069017 | | | | | 1.178396 |
| 47 | | | 1.061723 | | | | |
| 48 | | | | | | 2.215563 | 1.330646 |
| 49 | 1.222246 | | | | | | |
| 50 | | | | 1 | | | |
| 51 | 1 | | 1 | | | | |
| 52 | 1.599646 | 1.311877 | | | | | 1.440529 |
| 53 | | | | 1 | | | |
| 54 | | 1.015852 | | | | | |
| 55 | | 1.653765 | | | | | |
| 56 | | | 1.572277 | | | | |
| 57 | | | | 1.063885 | | 1.081746 | |
| 58 | | 1.052967 | | | | | |
| 59 | 1.104972 | | 1.424784 | | 1.063912 | | |
| 60 | | | | | | | 1.741443 |
| 61 | | | | | 1 | | |
| 62 | 1.755695 | | 1.016555 | | | | |
| 63 | | | | | 2.295292 | | |
| 64 | | | | 1.095555 | | | |
| 65 | | | | | | | 1.395999 |
| 66 | | | | | 1.257846 | | |
| 67 | | | | 1.278055 | | | |
| 68 | 4.624824 | | 1.109012 | | | | |
| 69 | | | | | | 1.502958 | |
| 70 | | | | 1.46283 | | | |
| 71 | | | | 1.021194 | | | |
| 72 | | | 1 | | | | |
| 73 | | 1.057853 | | | | | |
| 74 | | | | | | 2.242428 | 1.729419 |
| 75 | 1.176025 | 1.373753 | | | | | |
| 76 | | | | 1.467846 | | | |
| 77 | | | | 1.080482 | 1.524182 | 1.105737 | |
| 78 | | | | | | 1.05225 | 1.05225 |
| 79 | | 1.093712 | | | | | 1.093712 |
| 80 | 1.055195 | 1.055195 | | | | | 1.055195 |
| 81 | | 1 | | | | | 1 |
| 82 | | | | 1.143741 | | 1.143741 | |
| 83 | | 1 | | | | | 1 |
| 84 | | | | | | | 1.643055 |
| 85 | | | | 1.022202 | | | |
| 86 | | | | | | | 1.70742 |
| 87 | 1.403064 | | 1.239718 | | | | |
| 88 | | | | 1.347668 | 4.052728 | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 89 | | | | | | 1 | |
| 90 | | | | 1.368747 | | | |
| 91 | 1.341625 | | 1.617993 | | 1.20461 | | |
| 92 | | | | | 1 | 1 | |
| 93 | 2.863796 | | 2.944017 | | | | |
| 94 | | | | | | 2.791801 | |
| 95 | | 1.236778 | | | | | |
| 96 | 1.456749 | 1.456749 | | | | | |
| 97 | | | | | | | 1.539138 |
| 98 | | 1.681726 | | | | | |
| 99 | 1 | | 1 | | | | |
| 100 | | | 1.106243 | | | | |
| 101 | | | | 1.080476 | | | |
| 102 | | | | | | 2.125738 | |
| 103 | 2.356355 | 2.356355 | | | | | 1.773289 |
| 104 | | | | 2.732438 | | | |
| 105 | | | | | | 1.5744 | |
| 106 | | 1.993333 | | | | 1.993333 | 1.819678 |
| 107 | 1.574681 | | 1.574681 | | | | |
| 108 | | | | | | 1.689449 | |
| 109 | | | | 1 | | 1 | |
| 110 | | | | 1.131124 | | | |
| 111 | 1.664046 | | 1.371371 | | | | |
| 112 | | 1.078928 | | | | | 1.076951 |
| 113 | 1 | 1 | | | | | |
| 114 | | 1.663821 | | | | | 1.561739 |
| 115 | 2.647061 | | 2.504952 | | | | |
| 116 | 3.238016 | 1.114775 | | | | | |
| 117 | 1.731833 | | | | | | |
| 118 | | | | 1.077999 | | 1.618651 | |
| 119 | | | | 1.595898 | | 1.50427 | |
| 120 | | | | 1.016521 | | 1.016521 | |
| 121 | | | | 1 | | | |
| 122 | | | | 1.323381 | | | |
| 123 | 1.035264 | | | | | | 1.464322 |
| 124 | | 1 | | | | 1 | 1 |
| 125 | | | | 1.179949 | | | |
| 126 | | 1.46243 | | | | | |
| 127 | | | | 1 | | 1 | |
| 128 | | | | 1.850159 | | 1.850159 | |
| 129 | | 1.66563 | | | | | 1.380703 |
| 130 | | | 1.13189 | | 1.13189 | | |
| 131 | | | | 1 | 1 | | |
| 132 | 1.855917 | 1.159061 | 1.459745 | | | | |
| 133 | | | | 1 | | | |
| 134 | | | | | 1.095844 | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 135 | 1.234573 | 1.234573 | | | | | |
| 136 | | | | 1.629361 | | | |
| 137 | 2.1105 | | | | | | |
| 138 | | | | 1.50695 | | | |
| 139 | 1.118732 | 1.311298 | | | | | |
| 140 | | 1.32041 | | | | | |
| 141 | 2.223122 | | 2.223122 | | | | |
| 142 | | | | | 5.689615 | | |
| 143 | | | 1 | | | | |
| 144 | | | | | | 2.213812 | |
| 145 | | 1 | | | | | 1 |
| 146 | 1.123732 | | 1.38184 | | 1.04521 | | |
| 147 | | 1.013072 | | | | | 1.007814 |
| 148 | | | | 1.05411 | | | |
| 149 | | 1.867677 | | | | | |
| 150 | | 1.133551 | | | | | |
| 151 | | 1.009021 | | | | | |
| 152 | | | | 1.203646 | | | |
| 153 | | | | 1 | | | |
| 154 | | | | 1.044381 | | 1.554793 | |
| 155 | | | | 1.403973 | | | |
| 156 | | | | | | 3.778418 | |
| 157 | | | | | 1.125307 | | |
| 158 | 2.214154 | | 1.921627 | | | | |
| 159 | | | | 1.51464 | | 1.939271 | |
| 160 | | | | 1.891677 | | 2.482666 | |
| 161 | 1.422196 | | 1.422196 | | | | |
| 162 | 1.299189 | | | | | | |
| 163 | | | | | | | 1.612667 |
| 164 | 1 | | | | | | |
| 165 | | | | 1.001627 | | 1.274777 | |
| 166 | | | | 0.78066 | | 1.342157 | |
| 167 | | | | 1.052872 | | | |
| 168 | | | | | | | 1.198073 |
| 169 | | | | | | | 1.201309 |
| 170 | | | | 1.179211 | | | |
| 171 | | 1.688227 | | | | | 1.688227 |
| 172 | 1 | | 0.936432 | | | | |

# Appendix A4.12

| SrNum | VRS1 | CRS1 | VRS2 | CRS2 | VRS3 | CRS3 | VRS4 | CRS4 | VRS5 | CRS5 | VRS6 | CRS6 | VRS7 | CRS7 | MEANVRS of obs across clusters | MEANCRS of obs across clusters | VRS_GLOBAL % | CRS_GLOBAL % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.422 | 0.390 | | | 0.472 | 0.366 | | | | | | | | | 44.72 | 37.81 | 26.338 | 18.510 |
| 2 | 1.000 | 0.653 | | | 1.000 | 0.594 | | | | | | | | | 100.00 | 62.34 | 50.831 | 29.061 |
| 3 | | | | | | | | | | | | | 1.000 | 1.000 | 100.00 | 100.00 | 57.428 | 53.380 |
| 4 | 1.000 | 0.524 | 1.000 | 0.482 | | | | | | | | | | | 100.00 | 50.28 | 32.646 | 26.681 |
| 5 | | | | | | | | | | | | | 1.000 | 0.382 | 100.00 | 38.18 | 80.269 | 38.183 |
| 6 | | | | | | | 0.322 | 0.319 | | | | | | | 32.17 | 31.86 | 28.049 | 21.244 |
| 7 | 0.801 | 0.800 | | | 0.863 | 0.768 | | | | | | | | | 83.21 | 78.42 | 63.929 | 30.405 |
| 8 | | | 0.768 | 0.608 | | | | | | | | | | | 76.84 | 60.82 | 42.209 | 33.660 |
| 9 | 0.923 | 0.810 | | | 0.664 | 0.610 | | | | | | | | | 79.36 | 70.97 | 58.250 | 44.471 |
| 10 | 1.000 | 0.836 | | | 0.957 | 0.798 | | | | | | | | | 97.85 | 81.69 | 78.862 | 56.291 |
| 11 | 1.000 | 1.000 | | | 1.000 | 1.000 | | | 1.000 | 1.000 | | | | | 100.00 | 100.00 | 100.000 | 38.802 |
| 12 | 1.000 | 1.000 | 1.000 | 0.374 | | | | | | | | | | | 100.00 | 68.72 | 74.966 | 37.439 |
| 13 | | | | | 1.000 | 0.956 | | | | | | | | | 100.00 | 95.60 | 100.000 | 83.966 |
| 14 | 0.626 | 0.620 | | | 0.605 | 0.605 | | | | | | | | | 61.59 | 61.28 | 33.182 | 24.333 |
| 15 | 1.000 | 0.615 | | | | | | | | | | | 1.000 | 0.245 | 100.00 | 43.03 | 59.034 | 33.789 |
| 16 | | | | | | | 0.668 | 0.419 | | | 0.636 | 0.627 | | | 65.24 | 52.31 | 43.212 | 28.265 |
| 17 | | | 0.651 | 0.642 | | | | | | | | | | | 65.13 | 64.17 | 64.615 | 64.023 |
| 18 | 1.000 | 0.737 | | | 0.783 | 0.562 | | | | | | | | | 89.15 | 64.93 | 61.855 | 49.651 |
| 19 | | | | | | | 0.319 | 0.265 | | | 0.459 | 0.389 | | | 38.89 | 32.68 | 29.432 | 18.469 |
| 20 | | | 0.549 | 0.304 | | | | | | | | | 0.565 | 0.280 | 55.68 | 29.22 | 34.900 | 24.418 |
| 21 | | | | | | | 1.000 | 1.000 | | | | | | | 100.00 | 100.00 | 100.000 | 99.614 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 22 | | | 1.000 | 0.466 | | | | | | | | | 1.000 | 0.493 | 100.00 | 47.96 | 25.808 | 22.682 |
| 23 | | | | | | | | | | | 0.599 | 0.576 | | | 59.93 | 57.64 | 33.603 | 26.004 |
| 24 | 0.714 | 0.652 | | | 0.548 | 0.519 | | | | | | | | | 63.07 | 58.56 | 51.527 | 49.656 |
| 25 | | | 0.670 | 0.235 | | | | | | | | | 0.786 | 0.235 | 72.81 | 23.51 | 51.744 | 23.505 |
| 26 | | | | | | | 1.000 | 1.000 | | | | | | | 100.00 | 100.00 | 100.000 | 100.000 |
| 27 | | | | | | | | | 1.000 | 1.000 | | | | | 100.00 | 100.00 | 100.000 | 32.899 |
| 28 | | | | | | | | | | | | | 1.000 | 0.406 | 100.00 | 40.56 | 100.000 | 29.460 |
| 29 | 0.639 | 0.613 | | | 0.699 | 0.572 | | | | | | | | | 66.88 | 59.23 | 50.859 | 24.925 |
| 30 | | | | | | | | | 1.000 | 1.000 | | | | | 100.00 | 100.00 | 100.000 | 35.936 |
| 31 | | | | | | | 1.000 | 0.753 | | | | | | | 100.00 | 75.26 | 100.000 | 47.618 |
| 32 | | | | | | | 0.726 | 0.460 | | | 0.745 | 0.706 | | | 73.54 | 58.33 | 70.765 | 32.589 |
| 33 | | | 0.521 | 0.270 | | | | | | | | | 0.569 | 0.270 | 54.52 | 26.98 | 36.466 | 26.980 |
| 34 | | | 0.336 | 0.336 | | | | | | | | | | | 33.63 | 33.58 | 31.546 | 31.513 |
| 35 | | | | | | | 0.860 | 0.715 | | | | | | | 85.95 | 71.52 | 57.712 | 50.539 |
| 36 | | | | | | | | | 0.701 | 0.698 | | | | | 70.05 | 69.77 | 62.923 | 33.716 |
| 37 | 0.400 | 0.331 | 0.180 | 0.139 | | | | | | | | | 0.173 | 0.139 | 25.11 | 20.30 | 13.921 | 12.882 |
| 38 | | | 0.436 | 0.298 | | | | | | | | | 0.432 | 0.298 | 43.42 | 29.84 | 35.314 | 29.836 |
| 39 | 1.000 | 0.440 | | | | | | | | | | | 1.000 | 0.237 | 100.00 | 33.85 | 39.420 | 19.618 |
| 40 | 1.000 | 0.938 | 1.000 | 0.837 | 1.000 | 0.932 | | | | | | | | | 100.00 | 90.23 | 100.000 | 83.713 |
| 41 | 0.569 | 0.537 | | | 0.512 | 0.509 | | | | | | | | | 54.06 | 52.28 | 28.997 | 21.753 |
| 42 | 1.000 | 0.993 | 0.500 | 0.462 | | | | | | | | | | | 74.98 | 72.72 | 49.954 | 46.183 |
| 43 | | | | | | | | | | | 0.434 | 0.380 | | | 43.36 | 37.98 | 21.895 | 14.669 |
| 44 | | | | | 0.570 | 0.517 | | | | | | | | | 57.03 | 51.72 | 50.500 | 49.304 |
| 45 | | | 1.000 | 0.246 | | | | | | | | | 0.310 | 0.246 | 65.50 | 24.64 | 25.025 | 16.652 |
| 46 | | | 0.321 | 0.309 | | | | | | | | | 0.354 | 0.309 | 33.79 | 30.88 | 30.066 | 29.947 |
| 47 | | | | | 0.406 | 0.368 | | | | | | | | | 40.58 | 36.77 | 38.221 | 35.228 |
| 48 | | | | | | | | | | | 0.871 | 0.759 | 0.523 | 0.357 | 69.68 | 55.80 | 39.299 | 32.830 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 49 | 0.999 | 0.997 | | | | | | | | | | | | | 99.91 | 99.74 | 81.740 | 40.660 |
| 50 | | | | | | | 1.000 | 1.000 | | | | | | | 100.00 | 100.00 | 100.000 | 100.000 |
| 51 | 1.000 | 1.000 | | | 1.000 | 1.000 | | | | | | | | | 100.00 | 100.00 | 100.000 | 100.000 |
| 52 | 0.778 | 0.727 | 0.638 | 0.302 | | | | | | | | | 0.700 | 0.302 | 70.53 | 44.35 | 48.615 | 30.163 |
| 53 | | | | | | | 1.000 | 0.539 | | | | | | | 100.00 | 53.90 | 100.000 | 32.125 |
| 54 | | | 0.421 | 0.358 | | | | | | | | | | | 42.13 | 35.83 | 41.477 | 35.830 |
| 55 | | | 1.000 | 0.669 | | | | | | | | | | | 100.00 | 66.87 | 60.468 | 43.990 |
| 56 | | | | | 1.000 | 1.000 | | | | | | | | | 100.00 | 100.00 | 63.602 | 63.262 |
| 57 | | | | | | | 0.983 | 0.555 | | | 1.000 | 0.838 | | | 99.17 | 69.63 | 92.443 | 55.214 |
| 58 | | | 0.294 | 0.271 | | | | | | | | | | | 29.44 | 27.12 | 27.963 | 27.119 |
| 59 | 0.594 | 0.575 | | | 0.766 | 0.581 | | | 0.572 | 0.379 | | | | | 64.43 | 51.19 | 53.785 | 34.676 |
| 60 | | | | | | | | | | | | | 0.727 | 0.271 | 72.74 | 27.07 | 41.770 | 26.030 |
| 61 | | | | | | | | | 1.000 | 0.675 | | | | | 100.00 | 67.49 | 100.000 | 26.199 |
| 62 | 0.655 | 0.484 | | | 0.379 | 0.376 | | | | | | | | | 51.73 | 43.03 | 37.319 | 36.164 |
| 63 | | | | | | | | | 0.985 | 0.410 | | | | | 98.46 | 41.03 | 42.898 | 26.076 |
| 64 | | | | | | | 0.497 | 0.492 | | | | | | | 49.72 | 49.17 | 45.385 | 33.112 |
| 65 | | | | | | | | | | | | | 1.000 | 0.325 | 100.00 | 32.49 | 71.633 | 32.487 |
| 66 | | | | | | | | | 0.443 | 0.432 | | | | | 44.31 | 43.24 | 35.226 | 24.209 |
| 67 | | | | | | | 1.000 | 1.000 | | | | | | | 100.00 | 100.00 | 78.244 | 76.451 |
| 68 | 1.000 | 0.297 | | | 0.240 | 0.201 | | | | | | | | | 61.99 | 24.93 | 21.622 | 14.698 |
| 69 | | | | | | | | | | | 1.000 | 0.522 | | | 100.00 | 52.18 | 66.535 | 24.037 |
| 70 | | | | | | | 0.571 | 0.566 | | | | | | | 57.06 | 56.63 | 39.005 | 32.664 |
| 71 | | | | | | | 0.618 | 0.415 | | | | | | | 61.77 | 41.54 | 60.492 | 22.848 |
| 72 | | | | | 1.000 | 1.000 | | | | | | | | | 100.00 | 100.00 | 100.000 | 100.000 |
| 73 | | | 0.492 | 0.492 | | | | | | | | | | | 49.21 | 49.21 | 46.522 | 46.475 |
| 74 | | | | | | | | | | | 0.656 | 0.593 | 0.506 | 0.370 | 58.13 | 48.13 | 29.271 | 25.102 |
| 75 | 0.654 | 0.529 | 0.764 | 0.225 | | | | | | | | | | | 70.90 | 37.71 | 55.616 | 22.488 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 76 | | | | | | | 0.747 | 0.721 | | | | | | | 74.72 | 72.07 | 50.903 | 42.478 |
| 77 | | | | | | | 0.709 | 0.446 | 1.000 | 0.597 | 0.725 | 0.664 | | | 81.15 | 56.88 | 65.609 | 30.370 |
| 78 | | | | | | | | | | | 1.000 | 0.938 | 1.000 | 0.426 | 100.00 | 68.19 | 95.034 | 34.264 |
| 79 | | | 1.000 | 1.000 | | | | | | | | | 1.000 | 1.000 | 100.00 | 100.00 | 91.432 | 63.594 |
| 80 | 1.000 | 0.720 | 1.000 | 0.258 | | | | | | | | | 1.000 | 0.258 | 100.00 | 41.22 | 94.769 | 25.819 |
| 81 | | | 1.000 | 1.000 | | | | | | | | | 1.000 | 1.000 | 100.00 | 100.00 | 100.000 | 100.000 |
| 82 | | | | | | | 1.000 | 1.000 | | | 1.000 | 1.000 | | | 100.00 | 100.00 | 87.432 | 87.189 |
| 83 | | | 1.000 | 0.607 | | | | | | | | | 1.000 | 0.607 | 100.00 | 60.73 | 100.000 | 43.946 |
| 84 | | | | | | | | | | | | | 0.546 | 0.194 | 54.61 | 19.38 | 33.237 | 19.376 |
| 85 | | | | | | | 0.874 | 0.606 | | | | | | | 87.42 | 60.56 | 85.520 | 42.923 |
| 86 | | | | | | | | | | | | | 1.000 | 0.349 | 100.00 | 34.94 | 58.568 | 26.958 |
| 87 | 0.555 | 0.547 | | | 0.490 | 0.468 | | | | | | | | | 52.27 | 50.79 | 39.556 | 36.211 |
| 88 | | | | | | | 0.333 | 0.212 | 1.000 | 0.469 | | | | | 66.63 | 34.05 | 24.675 | 13.627 |
| 89 | | | | | | | | | | | 1.000 | 1.000 | | | 100.00 | 100.00 | 100.000 | 66.544 |
| 90 | | | | | | | 0.898 | 0.856 | | | | | | | 89.81 | 85.59 | 65.618 | 61.379 |
| 91 | 0.614 | 0.573 | | | 0.740 | 0.569 | | | 0.551 | 0.461 | | | | | 63.50 | 53.41 | 45.747 | 26.378 |
| 92 | | | | | | | | | 1.000 | 0.691 | 1.000 | 0.557 | | | 100.00 | 62.41 | 100.000 | 24.165 |
| 93 | 0.514 | 0.453 | | | 0.529 | 0.407 | | | | | | | | | 52.15 | 42.98 | 17.957 | 17.740 |
| 94 | | | | | | | | | | | 1.000 | 0.890 | | | 100.00 | 88.96 | 35.819 | 33.121 |
| 95 | | | 0.692 | 0.301 | | | | | | | | | | | 69.20 | 30.14 | 55.952 | 30.144 |
| 96 | 1.000 | 1.000 | 1.000 | 1.000 | | | | | | | | | | | 100.00 | 100.00 | 68.646 | 64.020 |
| 97 | | | | | | | | | | | | | 1.000 | 0.504 | 100.00 | 50.43 | 64.971 | 31.925 |
| 98 | | | 1.000 | 0.897 | | | | | | | | | | | 100.00 | 89.70 | 59.463 | 55.854 |
| 99 | 1.000 | 1.000 | | | 1.000 | 1.000 | | | | | | | | | 100.00 | 100.00 | 100.000 | 50.910 |
| 100 | | | | | 0.524 | 0.509 | | | | | | | | | 52.43 | 50.93 | 47.395 | 44.022 |
| 101 | | | | | | | 1.000 | 0.481 | | | | | | | 100.00 | 48.10 | 92.552 | 28.412 |
| 102 | | | | | | | | | | | 1.000 | 1.000 | | | 100.00 | 100.00 | 47.042 | 40.840 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 103 | 1.000 | 1.000 | 1.000 | 0.894 | | | | | | | | | 0.753 | 0.653 | 91.75 | 84.90 | 42.438 | 36.217 |
| 104 | | | | | | | 1.000 | 0.438 | | | | | | | 100.00 | 43.78 | 36.597 | 33.644 |
| 105 | | | | | | | | | | | 1.000 | 0.719 | | | 100.00 | 71.94 | 63.516 | 30.015 |
| 106 | | | 1.000 | 1.000 | | | | | | | 1.000 | 1.000 | 0.913 | 0.725 | 97.10 | 90.82 | 50.167 | 42.345 |
| 107 | 1.000 | 0.700 | | | 1.000 | 0.624 | | | | | | | | | 100.00 | 66.20 | 63.505 | 36.283 |
| 108 | | | | | | | | | | | 0.519 | 0.499 | | | 51.94 | 49.94 | 30.743 | 20.305 |
| 109 | | | | | | | 1.000 | 0.722 | | | 1.000 | 1.000 | | | 100.00 | 86.08 | 100.000 | 49.047 |
| 110 | | | | | | | 0.482 | 0.470 | | | | | | | 48.20 | 47.03 | 42.613 | 29.709 |
| 111 | 0.933 | 0.568 | | | 0.769 | 0.529 | | | | | | | | | 85.12 | 54.84 | 56.083 | 26.108 |
| 112 | | | 0.415 | 0.261 | | | | | | | | | 0.414 | 0.261 | 41.47 | 26.07 | 38.468 | 23.533 |
| 113 | 1.000 | 1.000 | 1.000 | 0.434 | | | | | | | | | | | 100.00 | 71.69 | 100.000 | 43.387 |
| 114 | | | 0.735 | 0.515 | | | | | | | | | 0.690 | 0.515 | 71.27 | 51.53 | 44.192 | 43.105 |
| 115 | 1.000 | 1.000 | | | 0.946 | 0.938 | | | | | | | | | 97.32 | 96.88 | 37.778 | 37.778 |
| 116 | 0.921 | 0.792 | 0.317 | 0.296 | | | | | | | | | | | 61.91 | 54.40 | 28.446 | 28.396 |
| 117 | 0.455 | 0.404 | | | | | | | | | | | | | 45.52 | 40.41 | 26.284 | 18.130 |
| 118 | | | | | | | 0.611 | 0.605 | | | 0.917 | 0.910 | | | 76.36 | 75.75 | 56.635 | 40.896 |
| 119 | | | | | | | 0.627 | 0.491 | | | 0.591 | 0.590 | | | 60.91 | 54.07 | 39.296 | 32.260 |
| 120 | | | | | | | 1.000 | 0.580 | | | 1.000 | 0.864 | | | 100.00 | 72.20 | 98.375 | 39.859 |
| 121 | | | | | | | 1.000 | 0.888 | | | | | | | 100.00 | 88.83 | 100.000 | 63.252 |
| 122 | | | | | | | 0.898 | 0.872 | | | | | | | 89.79 | 87.22 | 67.851 | 67.510 |
| 123 | 0.707 | 0.705 | | | | | | | | | | | 1.000 | 0.298 | 85.35 | 50.16 | 68.291 | 29.836 |
| 124 | | | 1.000 | 0.679 | | | | | | | 1.000 | 1.000 | 1.000 | 0.679 | 100.00 | 78.57 | 100.000 | 56.827 |
| 125 | | | | | | | 1.000 | 0.993 | | | | | | | 100.00 | 99.31 | 84.749 | 69.545 |
| 126 | | | 0.962 | 0.608 | | | | | | | | | | | 96.21 | 60.78 | 65.787 | 47.582 |
| 127 | | | | | | | 1.000 | 0.894 | | | 1.000 | 1.000 | | | 100.00 | 94.69 | 100.000 | 54.586 |
| 128 | | | | | | | 1.000 | 0.248 | | | 1.000 | 0.348 | | | 100.00 | 29.81 | 54.049 | 15.628 |
| 129 | | | 0.717 | 0.456 | | | | | | | | | 0.594 | 0.385 | 65.54 | 42.03 | 43.028 | 31.659 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 130 | | | | | 1.000 | 0.740 | | | 1.000 | 1.000 | | | | | 100.00 | 86.98 | 88.348 | 33.174 |
| 131 | | | | | | | 1.000 | 1.000 | 1.000 | 1.000 | | | | | 100.00 | 100.00 | 100.000 | 71.190 |
| 132 | 0.950 | 0.656 | 0.593 | 0.287 | 0.747 | 0.588 | | | | | | | | | 76.36 | 51.05 | 51.194 | 28.710 |
| 133 | | | | | | | 1.000 | 0.925 | | | | | | | 100.00 | 92.50 | 100.000 | 52.043 |
| 134 | | | | | | | | | 1.000 | 1.000 | | | | | 100.00 | 100.00 | 91.254 | 28.494 |
| 135 | 1.000 | 0.800 | 1.000 | 0.383 | | | | | | | | | | | 100.00 | 59.16 | 81.000 | 38.343 |
| 136 | | | | | | | 0.726 | 0.722 | | | | | | | 72.56 | 72.21 | 44.531 | 39.982 |
| 137 | 0.954 | 0.951 | | | | | | | | | | | | | 95.39 | 95.11 | 45.196 | 33.520 |
| 138 | | | | | | | 0.344 | 0.341 | | | | | | | 34.43 | 34.09 | 22.847 | 20.429 |
| 139 | 0.559 | 0.535 | 0.655 | 0.542 | | | | | | | | | | | 60.67 | 53.85 | 49.936 | 43.499 |
| 140 | | | 0.503 | 0.257 | | | | | | | | | | | 50.29 | 25.70 | 38.085 | 25.700 |
| 141 | 1.000 | 0.521 | | | 1.000 | 0.380 | | | | | | | | | 100.00 | 45.07 | 44.982 | 24.107 |
| 142 | | | | | | | | | 1.000 | 0.336 | | | | | 100.00 | 33.59 | 17.576 | 7.772 |
| 143 | | | | | 1.000 | 0.917 | | | | | | | | | 100.00 | 91.69 | 100.000 | 50.010 |
| 144 | | | | | | | | | | | 1.000 | 1.000 | | | 100.00 | 100.00 | 45.171 | 43.703 |
| 145 | | | 1.000 | 0.617 | | | | | | | | | 1.000 | 0.617 | 100.00 | 61.73 | 100.000 | 61.727 |
| 146 | 0.647 | 0.632 | | | 0.796 | 0.638 | | | 0.602 | 0.499 | | | | | 68.18 | 58.97 | 57.608 | 36.050 |
| 147 | | | 0.733 | 0.732 | | | | | | | | | 0.729 | 0.728 | 73.08 | 73.01 | 72.324 | 72.322 |
| 148 | | | | | | | 0.594 | 0.592 | | | | | | | 59.43 | 59.21 | 56.381 | 39.879 |
| 149 | | | 1.000 | 0.834 | | | | | | | | | | | 100.00 | 83.40 | 53.542 | 45.849 |
| 150 | | | 0.646 | 0.626 | | | | | | | | | | | 64.55 | 62.59 | 56.947 | 55.453 |
| 151 | | | 0.469 | 0.450 | | | | | | | | | | | 46.94 | 44.99 | 46.525 | 43.561 |
| 152 | | | | | | | 0.799 | 0.751 | | | | | | | 79.88 | 75.11 | 66.368 | 39.516 |
| 153 | | | | | | | 1.000 | 0.960 | | | | | | | 100.00 | 95.97 | 100.000 | 68.130 |
| 154 | | | | | | | 0.559 | 0.557 | | | 0.832 | 0.813 | | | 69.51 | 68.45 | 53.489 | 36.524 |
| 155 | | | | | | | 0.877 | 0.788 | | | | | | | 87.74 | 78.80 | 62.491 | 54.457 |
| 156 | | | | | | | | | | | 1.000 | 0.675 | | | 100.00 | 67.54 | 26.466 | 23.256 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 157 | | | | | | | | | 1.000 | 0.701 | | | | | 100.00 | 70.08 | 88.865 | 33.389 |
| 158 | 0.484 | 0.454 | | | 0.420 | 0.402 | | | | | | | | | 45.17 | 42.77 | 21.844 | 16.926 |
| 159 | | | | | | | 0.626 | 0.575 | | | 0.801 | 0.641 | | | 71.34 | 60.80 | 41.311 | 38.931 |
| 160 | | | | | | | 0.655 | 0.650 | | | 0.860 | 0.803 | | | 75.75 | 72.66 | 34.633 | 33.995 |
| 161 | 1.000 | 0.646 | | | 1.000 | 0.615 | | | | | | | | | 100.00 | 63.03 | 70.314 | 27.748 |
| 162 | 0.528 | 0.509 | | | | | | | | | | | | | 52.84 | 50.94 | 40.672 | 22.730 |
| 163 | | | | | | | | | | | | | 0.745 | 0.193 | 74.54 | 19.27 | 46.219 | 22.615 |
| 164 | 1.000 | 1.000 | | | | | | | | | | | | | 100.00 | 100.00 | 100.000 | 55.947 |
| 165 | | | | | | | 0.349 | 0.257 | | | 0.444 | 0.371 | | | 39.62 | 31.38 | 34.811 | 21.409 |
| 166 | | | | | | | 0.582 | 0.403 | | | 1.000 | 0.679 | | | 79.08 | 54.12 | 74.507 | 27.480 |
| 167 | | | | | | | 0.384 | 0.384 | | | | | | | 38.42 | 38.40 | 36.489 | 26.488 |
| 168 | | | | | | | | | | | | | 1.000 | 0.542 | 100.00 | 54.21 | 83.467 | 41.663 |
| 169 | | | | | | | | | | | | | 1.000 | 0.519 | 100.00 | 51.89 | 83.243 | 51.886 |
| 170 | | | | | | | 0.712 | 0.682 | | | | | | | 71.16 | 68.19 | 60.347 | 47.366 |
| 171 | | | 0.783 | 0.658 | | | | | | | | | 0.783 | 0.658 | 78.28 | 65.82 | 46.367 | 33.914 |
| 172 | 1.000 | 0.648 | | | 0.936 | 0.692 | | | | | | | | | 96.82 | 67.02 | 100.000 | 28.315 |

# Appendix A4.13

Cluster 1 Environmental Variables

| OBS | Extrev | SEREXP | INVEST | INDEXX |
|---|---|---|---|---|
| 1 | 151678 | 1057 | 185402 | 64.1 |
| 2 | 120210 | 4138 | 246339 | 68.8 |
| 4 | 38038 | 6298 | 46557 | 69.2 |
| 7 | 91960 | 11359 | 73122 | 55.1 |
| 9 | 38633 | 521 | 27790 | 53.3 |
| 10 | 20207 | 7766 | 47093 | 59.5 |
| 11 | 258319 | 11303 | 255764 | 60.6 |
| 12 | 79608 | 9043 | 72486 | 76.7 |
| 14 | 151628 | 14534 | 50033 | 53.1 |
| 15 | 111207 | 15282 | 159073 | 76 |
| 18 | 149877 | 128 | 137913 | 59.7 |
| 24 | 35900 | 4185 | 20017 | 54.8 |
| 29 | 235080 | 20057 | 124697 | 71.4 |
| 37 | 159279 | 4989 | 164235 | 83.8 |
| 39 | 179678 | 21782 | 132755 | 86.8 |
| 40 | 20828 | 156 | 13146 | 60.9 |
| 41 | 138630 | 18828 | 81388 | 63.4 |
| 42 | 38805 | 4714 | 47601 | 64.4 |
| 49 | 152372 | 12565 | 134463 | 73.2 |
| 51 | 20701 | 2770 | 15300 | 39.7 |
| 52 | 104651 | 7335 | 181149 | 84.8 |
| 59 | 311219 | 27387 | 243364 | 73 |
| 62 | 38746 | 8426 | 21797 | 59.3 |
| 68 | 134725 | 8524 | 125331 | 66.9 |
| 75 | 151551 | 3823 | 151402 | 79.8 |
| 80 | 89567 | 10210 | 295270 | 82.4 |
| 87 | 18857 | 632 | 40617 | 46.5 |
| 91 | 285486 | 11467 | 296843 | 64.8 |
| 93 | 37370 | 4137 | 41184 | 50 |
| 96 | 44579 | 774 | 40364 | 69.3 |
| 99 | 121345 | 704 | 153455 | 69.5 |
| 103 | 54687 | 10020 | 123482 | 79.2 |
| 107 | 43567 | 13307 | 74809 | 58.5 |
| 111 | 270536 | 3539 | 249671 | 74 |
| 113 | 40874 | 8675 | 104380 | 70.5 |
| 115 | 59060 | 18839 | 47458 | 56.3 |
| 116 | 34458 | 13039 | 51732 | 64.6 |
| 117 | 52961 | 8062 | 94618 | 67 |
| 123 | 81164 | 22534 | 102157 | 70.3 |

| | | | | |
|---|---|---|---|---|
| 132 | 29710 | 3307 | 16587 | 61 |
| 135 | 85568 | 10307 | 69581 | 76.4 |
| 137 | 123303 | 12840 | 107309 | 68.3 |
| 139 | 21279 | 4530 | 8078 | 66.4 |
| 141 | 300494 | 8142 | 233788 | 65.2 |
| 146 | 263631 | 25373 | 193963 | 68.1 |
| 158 | 140123 | 8679 | 153570 | 61.4 |
| 161 | 206037 | 11265 | 225461 | 39.1 |
| 162 | 98842 | 10148 | 176986 | 71.4 |
| 164 | 107685 | 3037 | 133707 | 71.1 |
| 172 | 132465 | 20075 | 119056 | 69.1 |

Cluster 2 Environmental Variables

| OBS | Extrev | SEREXP | INVEST | INDEXX |
|---|---|---|---|---|
| 4 | 38038 | 6298 | 46557 | 69.2 |
| 8 | 49960 | 3406 | 42133 | 75 |
| 12 | 79608 | 9043 | 72486 | 76.7 |
| 17 | 30687 | 2407 | 20557 | 80.1 |
| 20 | 169876 | 2785 | 130269 | 92.6 |
| 22 | 156518 | 10737 | 117529 | 89.4 |
| 25 | 212063 | 4893 | 149822 | 98.7 |
| 33 | 49239 | 10157 | 38655 | 84.1 |
| 34 | 77330 | 6978 | 83329 | 80.3 |
| 37 | 159279 | 4989 | 164235 | 83.8 |
| 38 | 71422 | 8478 | 154526 | 89.2 |
| 40 | 20828 | 156 | 13146 | 60.9 |
| 42 | 38805 | 4714 | 47601 | 64.4 |
| 45 | 156174 | 11286 | 107797 | 108.9 |
| 46 | 68557 | 1132 | 73878 | 90.2 |
| 52 | 104651 | 7335 | 181149 | 84.8 |
| 54 | 52092 | 20 | 52624 | 85.1 |
| 55 | 28231 | 9517 | 29288 | 72.7 |
| 58 | 52567 | 832 | 59687 | 85.4 |
| 73 | 25568 | 2297 | 44297 | 79.9 |
| 75 | 151551 | 3823 | 151402 | 79.8 |
| 79 | 54765 | 13533 | 51538 | 83 |
| 80 | 89567 | 10210 | 295270 | 82.4 |
| 81 | 199408 | 2612 | 12285 | 90 |
| 83 | 83456 | 9740 | 97255 | 82.4 |
| 95 | 34005 | 558 | 76775 | 76.4 |
| 96 | 44579 | 774 | 40364 | 69.3 |
| 98 | 90675 | 8365 | 27380 | 84 |
| 103 | 54687 | 10020 | 123482 | 79.2 |
| 106 | 50617 | 575 | 64561 | 141.3 |
| 112 | 22294 | 620 | 7596 | 90.5 |

| | | | | |
|---|---|---|---|---|
| 113 | 40874 | 8675 | 104380 | 70.5 |
| 114 | 43639 | 2105 | 23563 | 93.5 |
| 116 | 34458 | 13039 | 51732 | 64.6 |
| 124 | 39190 | 4652 | 33032 | 121.3 |
| 126 | 49837 | 4401 | 40808 | 83.8 |
| 129 | 60123 | 792 | 178938 | 105.3 |
| 132 | 29710 | 3307 | 16587 | 61 |
| 135 | 85568 | 10307 | 69581 | 76.4 |
| 139 | 21279 | 4530 | 8078 | 66.4 |
| 140 | 94314 | 7826 | 69268 | 80.3 |
| 145 | 90433 | 5348 | 93153 | 99.5 |
| 147 | 20328 | 17244 | 31369 | 73.7 |
| 149 | 81920 | 8896 | 40319 | 79 |
| 150 | 10990 | 18 | 34519 | 75.9 |
| 151 | 37324 | 7126 | 33737 | 72.3 |
| 171 | 88939 | 14537 | 55634 | 88.6 |

Cluster 3 Environmental Variables

| OBS | Extrev | SEREXP | INVEST | INDEXX |
|---|---|---|---|---|
| 1 | 151678 | 1057 | 185402 | 64.1 |
| 2 | 120210 | 4138 | 246339 | 68.8 |
| 7 | 91960 | 11359 | 73122 | 55.1 |
| 9 | 38633 | 521 | 27790 | 53.3 |
| 10 | 20207 | 7766 | 47093 | 59.5 |
| 11 | 258319 | 11303 | 255764 | 60.6 |
| 13 | 50907 | 5791 | 16350 | 42.8 |
| 14 | 151628 | 14534 | 50033 | 53.1 |
| 18 | 149877 | 128 | 137913 | 59.7 |
| 24 | 35900 | 4185 | 20017 | 54.8 |
| 29 | 235080 | 20057 | 124697 | 71.4 |
| 40 | 20828 | 156 | 13146 | 60.9 |
| 41 | 138630 | 18828 | 81388 | 63.4 |
| 44 | 110483 | 8074 | 104873 | 39.9 |
| 47 | 128103 | 584 | 61875 | 53.1 |
| 51 | 20701 | 2770 | 15300 | 39.7 |
| 56 | 24415 | 3709 | 28670 | 31.3 |
| 59 | 311219 | 27387 | 243364 | 73 |
| 62 | 38746 | 8426 | 21797 | 59.3 |
| 68 | 134725 | 8524 | 125331 | 66.9 |
| 72 | 63925 | 3081 | 67063 | 36.3 |
| 87 | 18857 | 632 | 40617 | 46.5 |
| 91 | 285486 | 11467 | 296843 | 64.8 |
| 93 | 37370 | 4137 | 41184 | 50 |
| 99 | 121345 | 704 | 153455 | 69.5 |
| 100 | 60511 | 8027 | 46770 | 40.3 |

| | | | | |
|---|---|---|---|---|
| 107 | 43567 | 13307 | 74809 | 58.5 |
| 111 | 270536 | 3539 | 249671 | 74 |
| 115 | 59060 | 18839 | 47458 | 56.3 |
| 130 | 236456 | 12254 | 461035 | 61.2 |
| 132 | 29710 | 3307 | 16587 | 61 |
| 141 | 300494 | 8142 | 233788 | 65.2 |
| 143 | 160591 | 1365 | 168319 | 49 |
| 146 | 263631 | 25373 | 193963 | 68.1 |
| 158 | 140123 | 8679 | 153570 | 61.4 |
| 161 | 206037 | 11265 | 225461 | 39.1 |
| 172 | 132465 | 20075 | 119056 | 69.1 |

Cluster 4 Environmental Variables

| OBS | Extrev | SEREXP | INVEST | INDEXX |
|---|---|---|---|---|
| 6 | 45520 | 2768 | 44573 | 66.1 |
| 16 | 70917 | 9051 | 99699 | 84.9 |
| 19 | 82421 | 1474 | 75630 | 78.3 |
| 21 | 12710 | 220 | 14721 | 60.6 |
| 26 | 50836 | 310 | 101538 | 69 |
| 31 | 59771 | 1473 | 62012 | 69.5 |
| 32 | 100496 | 4291 | 115856 | 79.3 |
| 35 | 11586 | 1885 | 17085 | 38.2 |
| 50 | 8439 | 100 | 12379 | 46.9 |
| 53 | 124518 | 4599 | 172645 | 75.6 |
| 57 | 139115 | 23066 | 205796 | 71.9 |
| 64 | 60897 | 9526 | 46656 | 69.3 |
| 67 | 4211 | 1029 | 13073 | 51.7 |
| 70 | 57689 | 671 | 65742 | 47.7 |
| 71 | 109900 | 7999 | 71639 | 56 |
| 76 | 19887 | 6635 | 55892 | 55.3 |
| 77 | 216677 | 23604 | 286992 | 83 |
| 82 | 27955 | 5283 | 17303 | 75.6 |
| 85 | 74292 | 15467 | 52049 | 63.5 |
| 88 | 426332 | 24989 | 186291 | 79.3 |
| 90 | 33444 | 3283 | 39997 | 65.2 |
| 101 | 87546 | 23233 | 64501 | 57.5 |
| 104 | 7253 | 317 | 23567 | 64.1 |
| 109 | 108568 | 14393 | 194193 | 78.1 |
| 110 | 112321 | 7073 | 137766 | 72.8 |
| 118 | 37180 | 8264 | 88840 | 75.8 |
| 119 | 23669 | 264 | 29019 | 90.3 |
| 120 | 114358 | 21985 | 157663 | 87.4 |
| 121 | 45694 | 9804 | 91308 | 65.4 |
| 122 | 8845 | 78 | 31621 | 55.1 |
| 125 | 17476 | 396 | 19009 | 50.7 |

| | | | | |
|---|---|---|---|---|
| 127 | 12551 | 1439 | 44650 | 80.3 |
| 128 | 136717 | 43020 | 239704 | 100.7 |
| 131 | 60332 | 880 | 367584 | 57.9 |
| 133 | 10732 | 8111 | 37623 | 68.2 |
| 136 | 9103 | 22012 | 13353 | 44.7 |
| 138 | 98217 | 267 | 89136 | 60.5 |
| 148 | 42826 | 11056 | 61834 | 69.6 |
| 152 | 18921 | 689 | 35889 | 60.1 |
| 153 | 11396 | 5031 | 40833 | 60.1 |
| 154 | 41568 | 16550 | 108425 | 70.4 |
| 155 | 37942 | 3296 | 99978 | 54 |
| 159 | 19968 | 5775 | 25582 | 73.2 |
| 160 | 14554 | 3540 | 32614 | 80.9 |
| 165 | 188687 | 43255 | 94393 | 91.1 |
| 166 | 184747 | 15547 | 175590 | 85.2 |
| 167 | 77860 | 14794 | 25769 | 69.7 |
| 170 | 30008 | 3920 | 21200 | 52.2 |

Cluster 5 Environmental Variables

| OBS | Extrev | SEREXP | INVEST | INDEXX |
|---|---|---|---|---|
| 11 | 258319 | 11303 | 255764 | 60.6 |
| 27 | 1441722 | 134642 | 1471497 | 73 |
| 30 | 540107 | 22171 | 724765 | 112.5 |
| 36 | 182243 | 43172 | 270096 | 69.8 |
| 59 | 311219 | 27387 | 243364 | 73 |
| 61 | 631984 | 18835 | 330572 | 66.3 |
| 63 | 351919 | 35014 | 521460 | 90.1 |
| 66 | 964398 | 14721 | 349469 | 99.8 |
| 77 | 216677 | 23604 | 286992 | 83 |
| 88 | 426332 | 24989 | 186291 | 79.3 |
| 91 | 285486 | 11467 | 296843 | 64.8 |
| 92 | 410579 | 44504 | 296602 | 87.2 |
| 130 | 236456 | 12254 | 461035 | 61.2 |
| 131 | 60332 | 880 | 367584 | 57.9 |
| 134 | 361435 | 44565 | 885017 | 108.8 |
| 142 | 286484 | 47697 | 335683 | 71.7 |
| 146 | 263631 | 25373 | 193963 | 68.1 |
| 157 | 660668 | 97088 | 666449 | 112.2 |

Cluster 6 Environmental Variables

| OBS | Extrev | SEREXP | INVEST | INDEXX |
|---|---|---|---|---|
| 16 | 70917 | 9051 | 99699 | 84.9 |
| 19 | 82421 | 1474 | 75630 | 78.3 |
| 23 | 22862 | 21415 | 20842 | 83.8 |

| | | | | |
|---|---|---|---|---|
| 32 | 100496 | 4291 | 115856 | 79.3 |
| 43 | 102365 | 25925 | 110012 | 98.4 |
| 48 | 14924 | 5970 | 24143 | 139.3 |
| 57 | 139115 | 23066 | 205796 | 71.9 |
| 69 | 40706 | 30659 | 210495 | 108 |
| 74 | 52484 | 9413 | 61737 | 181.8 |
| 77 | 216677 | 23604 | 286992 | 83 |
| 78 | 198964 | 27089 | 255439 | 149.6 |
| 82 | 27955 | 5283 | 17303 | 75.6 |
| 89 | 28675 | 3031 | 193175 | 111.4 |
| 92 | 410579 | 44504 | 296602 | 87.2 |
| 94 | 23441 | 6010 | 50609 | 90.4 |
| 102 | 47577 | 4959 | 80102 | 102.2 |
| 105 | 184002 | 29580 | 134731 | 114.9 |
| 106 | 50617 | 575 | 64561 | 141.3 |
| 108 | 62346 | 9789 | 63439 | 99.2 |
| 109 | 108568 | 14393 | 194193 | 78.1 |
| 118 | 37180 | 8264 | 88840 | 75.8 |
| 119 | 23669 | 264 | 29019 | 90.3 |
| 120 | 114358 | 21985 | 157663 | 87.4 |
| 124 | 39190 | 4652 | 33032 | 121.3 |
| 127 | 12551 | 1439 | 44650 | 80.3 |
| 128 | 136717 | 43020 | 239704 | 100.7 |
| 144 | 107957 | 10930 | 97338 | 135.3 |
| 154 | 41568 | 16550 | 108425 | 70.4 |
| 156 | 96785 | 8040 | 63405 | 95 |
| 159 | 19968 | 5775 | 25582 | 73.2 |
| 160 | 14554 | 3540 | 32614 | 80.9 |
| 165 | 188687 | 43255 | 94393 | 91.1 |
| 166 | 184747 | 15547 | 175590 | 85.2 |

Cluster 7 Environmental Variables

| OBS | Extrev | SEREXP | INVEST | INDEXX |
|---|---|---|---|---|
| 3 | 79260 | 16344 | 113479 | 90.5 |
| 5 | 91056 | 19112 | 141045 | 92.5 |
| 15 | 111207 | 15282 | 159073 | 76 |
| 20 | 169876 | 2785 | 130269 | 92.6 |
| 22 | 156518 | 10737 | 117529 | 89.4 |
| 25 | 212063 | 4893 | 149822 | 98.7 |
| 28 | 156053 | 25349 | 202670 | 93.1 |
| 33 | 49239 | 10157 | 38655 | 84.1 |
| 37 | 159279 | 4989 | 164235 | 83.8 |
| 38 | 71422 | 8478 | 154526 | 89.2 |
| 39 | 179678 | 21782 | 132755 | 86.8 |
| 45 | 156174 | 11286 | 107797 | 108.9 |

| | | | | |
|---|---|---|---|---|
| 46 | 68557 | 1132 | 73878 | 90.2 |
| 48 | 14924 | 5970 | 24143 | 139.3 |
| 52 | 104651 | 7335 | 181149 | 84.8 |
| 60 | 164581 | 13412 | 103037 | 94.7 |
| 65 | 82938 | 18609 | 188832 | 84.1 |
| 74 | 52484 | 9413 | 61737 | 181.8 |
| 78 | 198964 | 27089 | 255439 | 149.6 |
| 79 | 54765 | 13533 | 51538 | 83 |
| 80 | 89567 | 10210 | 295270 | 82.4 |
| 81 | 199408 | 2612 | 12285 | 90 |
| 83 | 83456 | 9740 | 97255 | 82.4 |
| 84 | 159600 | 30915 | 178449 | 100.2 |
| 86 | 49233 | 26218 | 83055 | 87 |
| 97 | 23852 | 29429 | 71437 | 83.3 |
| 103 | 54687 | 10020 | 123482 | 79.2 |
| 106 | 50617 | 575 | 64561 | 141.3 |
| 112 | 22294 | 620 | 7596 | 90.5 |
| 114 | 43639 | 2105 | 23563 | 93.5 |
| 123 | 81164 | 22534 | 102157 | 70.3 |
| 124 | 39190 | 4652 | 33032 | 121.3 |
| 129 | 60123 | 792 | 178938 | 105.3 |
| 145 | 90433 | 5348 | 93153 | 99.5 |
| 147 | 20328 | 17244 | 31369 | 73.7 |
| 163 | 118669 | 15677 | 208152 | 94.6 |
| 168 | 171326 | 9421 | 132714 | 100.4 |
| 169 | 79865 | 11631 | 126424 | 95.2 |
| 171 | 88939 | 14537 | 55634 | 88.6 |

# Appendix A 5-1a

**Principal Components Report**
Page/Date/Time 1 6/21/2004 9:23:26 PM
Database

**Robust and Missing-Value Estimation Iteration Section**

| No. | Count | Trace of Covar Matrix | Percent Change |
|---|---|---|---|
| 0 | 123 | 5.220216E+10 | 0.00 |
| 1 | 123 | 5.220216E+10 | 0.00 |
| 2 | 123 | 1.514742E+10 | -70.98 |
| 3 | 123 | 1.514742E+10 | 0.00 |
| 4 | 123 | 1.048469E+10 | -30.78 |
| 5 | 123 | 1.048469E+10 | 0.00 |
| 6 | 123 | 9.314351E+09 | -11.16 |

**Descriptive Statistics Section**

| Variables | Count | Mean | Standard Deviation | Communality |
|---|---|---|---|---|
| Political_ | 123 | 0.6806819 | 0.4681193 | 0.969480 |
| SEREXP | 123 | 8441.404 | 7955.14 | 0.622932 |
| EXTREV | 123 | 79873.93 | 64890.59 | 0.854713 |
| INVEST | 123 | 89584.37 | 70994.91 | 0.794990 |
| indexx | 123 | 72.59616 | 15.33005 | 0.986126 |

**Correlation Section**

| Variables | Variables Political_ | SEREXP | EXTREV | INVEST | indexx |
|---|---|---|---|---|---|
| Political_ | 1.000000 | 0.079912 | 0.267288 | 0.186436 | 0.097450 |
| SEREXP | 0.079912 | 1.000000 | 0.524199 | 0.464125 | 0.239930 |
| EXTREV | 0.267288 | 0.524199 | 1.000000 | 0.781217 | 0.191849 |
| INVEST | 0.186436 | 0.464125 | 0.781217 | 1.000000 | 0.231746 |
| indexx | 0.097450 | 0.239930 | 0.191849 | 0.231746 | 1.000000 |

Phi=0.370224 Log(Det|R|)=-1.438979 Bartlett Test=171.96 DF=10 Prob=0.000000

**Bar Chart of Absolute Correlation Section**

<table>
<tr><th>Variables</th><th>Variables Political_</th><th>SEREXP</th><th>EXTREV</th><th>INVEST</th><th>indexx</th></tr>
<tr><td>Political_</td><td></td><td>||</td><td>||||||</td><td>||||</td><td>||</td></tr>
<tr><td>SEREXP</td><td>||</td><td></td><td>|||||||||||</td><td>||||||||||</td><td>|||||</td></tr>
<tr><td>EXTREV</td><td>||||||</td><td>|||||||||||</td><td></td><td>||||||||||||||||</td><td>||||</td></tr>
<tr><td>INVEST</td><td>||||</td><td>||||||||||</td><td>||||||||||||||||</td><td></td><td>|||||</td></tr>
<tr><td>indexx</td><td>||</td><td>|||||</td><td>||||</td><td>|||||</td><td></td></tr>
</table>

Phi=0.370224 Log(Det|R|)=-1.438979 Bartlett Test=171.96 DF=10 Prob=0.000000

## Principal Components Report

Page/Date/Time 2 6/21/2004 9:23:26 PM
Database

### Eigenvalues

<table>
<tr><th></th><th></th><th>Individual</th><th>Cumulative</th><th></th></tr>
<tr><th>No.</th><th>Eigenvalue</th><th>Percent</th><th>Percent</th><th>Scree Plot</th></tr>
<tr><td>1</td><td>2.381971</td><td>47.64</td><td>47.64</td><td>||||||||||</td></tr>
<tr><td>2</td><td>0.949981</td><td>19.00</td><td>66.64</td><td>||||</td></tr>
<tr><td>3</td><td>0.896289</td><td>17.93</td><td>84.56</td><td>||||</td></tr>
<tr><td>4</td><td>0.564664</td><td>11.29</td><td>95.86</td><td>|||</td></tr>
<tr><td>5</td><td>0.207095</td><td>4.14</td><td>100.00</td><td>|</td></tr>
</table>

### Eigenvectors

| | Factors | | |
|---|---|---|---|
| **Variables** | **Factor1** | **Factor2** | **Factor3** |
| Political_ | -0.234104 | 0.913568 | -0.226732 |
| SEREXP | -0.469135 | -0.312032 | 0.083135 |
| EXTREV | -0.578764 | 0.045248 | 0.247458 |
| INVEST | -0.562012 | -0.043942 | 0.213335 |
| indexx | -0.272547 | -0.253082 | -0.913747 |

### Bar Chart of Absolute Eigenvectors

<table>
<tr><th></th><th>Factors</th><th></th><th></th></tr>
<tr><th>Variables</th><th>Factor1</th><th>Factor2</th><th>Factor3</th></tr>
<tr><td>Political_</td><td>|||||</td><td>|||||||||||||||||||</td><td>|||||</td></tr>
<tr><td>SEREXP</td><td>||||||||||</td><td>|||||||</td><td>||</td></tr>
<tr><td>EXTREV</td><td>||||||||||||</td><td>|</td><td>|||||</td></tr>
<tr><td>INVEST</td><td>||||||||||||</td><td>|</td><td>|||||</td></tr>
<tr><td>indexx</td><td>||||||</td><td>||||||</td><td>|||||||||||||||||||</td></tr>
</table>

### Factor Loadings

| | Factors | | |
|---|---|---|---|
| **Variables** | **Factor1** | **Factor2** | **Factor3** |
| Political_ | -0.361308 | 0.890427 | -0.214653 |
| SEREXP | -0.724046 | -0.304129 | 0.078706 |
| EXTREV | -0.893243 | 0.044102 | 0.234275 |
| INVEST | -0.867389 | -0.042829 | 0.201970 |
| indexx | -0.420640 | -0.246672 | -0.865068 |

## Principal Components Report

Page/Date/Time 3 6/21/2004 9:23:26 PM
Database

### Bar Chart of Absolute Factor Loadings

<table>
<tr><th></th><th>Factors</th><th></th><th></th></tr>
<tr><th>Variables</th><th>Factor1</th><th>Factor2</th><th>Factor3</th></tr>
<tr><td>Political_</td><td>||||||||</td><td>||||||||||||||||||</td><td>|||||</td></tr>
<tr><td>SEREXP</td><td>|||||||||||||||</td><td>|||||||</td><td>||</td></tr>
<tr><td>EXTREV</td><td>||||||||||||||||||</td><td>|</td><td>|||||</td></tr>
<tr><td>INVEST</td><td>||||||||||||||||||</td><td>|</td><td>|||||</td></tr>
<tr><td>indexx</td><td>|||||||||</td><td>|||||</td><td>||||||||||||||||||</td></tr>
</table>

### Communalities

| | Factors | | | |
|---|---|---|---|---|
| **Variables** | **Factor1** | **Factor2** | **Factor3** | **Communality** |
| Political_ | 0.130543 | 0.792860 | 0.046076 | 0.969480 |
| SEREXP | 0.524243 | 0.092494 | 0.006195 | 0.622932 |
| EXTREV | 0.797883 | 0.001945 | 0.054885 | 0.854713 |
| INVEST | 0.752364 | 0.001834 | 0.040792 | 0.794990 |
| indexx | 0.176938 | 0.060847 | 0.748342 | 0.986126 |

### Bar Chart of Communalities

<table>
<tr><th></th><th>Factors</th><th></th><th></th><th></th></tr>
<tr><th>Variables</th><th>Factor1</th><th>Factor2</th><th>Factor3</th><th>Communality</th></tr>
<tr><td>Political_</td><td>|||</td><td>||||||||||||||||</td><td>|</td><td>||||||||||||||||||||</td></tr>
<tr><td>SEREXP</td><td>|||||||||||</td><td>||</td><td>|</td><td>|||||||||||||</td></tr>
<tr><td>EXTREV</td><td>||||||||||||||||</td><td>|</td><td>||</td><td>||||||||||||||||||</td></tr>
<tr><td>INVEST</td><td>||||||||||||||||</td><td>|</td><td>|</td><td>||||||||||||||||</td></tr>
<tr><td>indexx</td><td>||||</td><td>||</td><td>|||||||||||||||</td><td>||||||||||||||||||||</td></tr>
</table>

### Factor Structure Summary

| | Factors | |
|---|---|---|
| **Factor1** | **Factor2** | **Factor3** |
| EXTREV | Political_ | indexx |
| INVEST | | |
| SEREXP | | |

**Residual Section**

| Row | T2 | T2 Prob | Weight | Q0 | Q1 | Q2 | Q3 |
|---|---|---|---|---|---|---|---|
| 1 | 5.78 | 0.3544 | 0.93 | 4.68 | 3.74 | 2.65 | 1.95 |
| 2 | 10.36 | 0.0830 | 0.66 | 6.08 | 4.01 | 3.39 | 2.97* |
| 3 | 3.06 | 0.7066 | 1.26 | 2.93 | 1.66 | 1.66 | 0.51 |
| 4 | 1.27 | 0.9414 | 1.65 | 1.37 | 0.82 | 0.24 | 0.17 |
| 5 | 2.64 | 0.7671 | 1.29 | 3.48 | 1.37 | 0.38 | 0.23 |
| 6 | 2.54 | 0.7818 | 1.34 | 1.99 | 1.99 | 1.32 | 0.49 |
| 7 | 2.85 | 0.7369 | 1.28 | 2.41 | 1.44 | 0.72 | 0.65 |
| 8 | 10.81 | 0.0712 | 0.64 | 14.25 | 5.11 | 4.58 | 1.45 |
| 9 | .73 | 0.9822 | 1.84 | 0.60 | 0.58 | 0.29 | 0.09 |
| 10 | 5.41 | 0.3936 | 0.94 | 5.62 | 3.76 | 2.21 | 0.61 |
| 11 | 8.50 | 0.1534 | 0.73 | 4.20 | 3.95 | 3.34 | 1.84 |
| 12 | 1.99 | 0.8583 | 1.51 | 2.45 | 0.33 | 0.26 | 0.25 |
| 13 | 4.25 | 0.5358 | 1.05 | 3.06 | 2.52 | 1.22 | 1.21 |
| 14 | 7.29 | 0.2253 | 0.79 | 4.93 | 3.22 | 2.91 | 2.03 |
| 15 | 3.30 | 0.6709 | 1.18 | 5.98 | 1.00 | 0.35 | 0.12 |
| 16 | 3.41 | 0.6543 | 1.20 | 3.30 | 1.05 | 0.97 | 0.40 |
| 17 | 3.96 | 0.5756 | 1.09 | 3.44 | 2.34 | 1.39 | 1.24 |
| 18 | 541.76* | 0.0000 | 0.02 | 1071.47 | 129.27* | 111.30* | 1.34 |
| 19 | 10.90 | 0.0692 | 0.63 | 8.57 | 2.39 | 2.32 | 1.77 |
| 20 | 3.06 | 0.7056 | 1.22 | 3.17 | 1.72 | 0.72 | 0.64 |
| 21 | 3.93 | 0.5797 | 1.10 | 2.82 | 2.81 | 1.18 | 1.17 |
| 22 | .82 | 0.9771 | 1.80 | 0.76 | 0.74 | 0.43 | 0.00 |
| 23 | 6.69 | 0.2707 | 0.80 | 9.98 | 3.62 | 3.36 | 0.00 |
| 24 | 25.10* | 0.0004 | 0.32 | 28.51 | 8.26* | 7.72* | 6.01* |
| 25 | 3.72 | 0.6104 | 1.16 | 3.79 | 1.68 | 1.34 | 1.23 |
| 26 | 4.11 | 0.5547 | 1.12 | 2.49 | 1.69 | 1.60 | 0.64 |
| 27 | 4.99 | 0.4419 | 1.01 | 6.87 | 0.96 | 0.95 | 0.83 |
| 28 | 2.59 | 0.7743 | 1.34 | 4.12 | 1.34 | 0.02 | 0.02 |
| 29 | 4.74 | 0.4727 | 1.04 | 3.36 | 2.22 | 2.05 | 1.56 |
| 30 | 1.40 | 0.9282 | 1.61 | 1.72 | 0.90 | 0.09 | 0.09 |
| 31 | 9.82 | 0.0994 | 0.66 | 9.98 | 7.70* | 1.76 | 0.98 |
| 32 | 3.29 | 0.6725 | 1.21 | 2.71 | 2.67 | 2.29 | 0.41 |
| 33 | 6.35 | 0.3004 | 0.87 | 3.76 | 3.57 | 1.87 | 0.82 |
| 34 | 1.57 | 0.9102 | 1.61 | 2.38 | 0.38 | 0.15 | 0.09 |
| 35 | 3.72 | 0.6104 | 1.18 | 2.93 | 1.35 | 1.17 | 0.89 |
| 36 | 2.91 | 0.7285 | 1.28 | 2.71 | 2.28 | 1.71 | 0.26 |
| 37 | 2.18 | 0.8331 | 1.42 | 1.84 | 1.33 | 0.99 | 0.71 |
| 38 | 8.65 | 0.1463 | 0.69 | 9.54 | 6.19 | 3.97 | 0.50 |
| 39 | 2.63 | 0.7691 | 1.33 | 2.43 | 2.14 | 1.64 | 0.22 |
| 40 | 5.51 | 0.3826 | 0.94 | 4.67 | 1.76 | 1.75 | 0.63 |
| 41 | 114.59* | 0.0000 | 0.08 | 86.25 | 30.11* | 29.81* | 19.83* |
| 42 | 38.79* | 0.0000 | 0.23 | 67.51 | 5.36 | 4.75* | 2.74* |
| 43 | 2.65 | 0.7663 | 1.30 | 2.63 | 1.92 | 0.22 | 0.11 |
| 44 | 7.13 | 0.2371 | 0.83 | 4.62 | 1.46 | 1.46 | 1.28 |
| 45 | 4.08 | 0.5590 | 1.06 | 7.36 | 1.46 | 0.97 | 0.01 |
| 46 | 1.42 | 0.9257 | 1.64 | 1.57 | 0.87 | 0.34 | 0.09 |
| 47 | 5.00 | 0.4410 | 0.98 | 3.57 | 3.28 | 2.27 | 0.38 |
| 48 | 6.51 | 0.2864 | 0.84 | 6.69 | 5.43 | 3.37 | 0.04 |
| 49 | 2.14 | 0.8387 | 1.44 | 2.40 | 1.56 | 1.02 | 0.02 |
| 50 | 59.30* | 0.0000 | 0.14 | 53.21 | 51.78* | 41.72* | 1.31 |
| 51 | 3.41 | 0.6553 | 1.21 | 3.00 | 1.69 | 1.21 | 1.18 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 52 | 12.24* | 0.0436 | 0.59 | 18.38 | 5.98 | 1.48 | 0.51 |
| 53 | 20.61* | 0.0022 | 0.39 | 9.34 | 4.70 | 4.63 | 4.63* |

## Principal Components Report

Page/Date/Time 5 6/21/2004 9:23:26 PM
Database

**Residual Section**

| Row | T2 | T2 Prob | Weight | Q0 | Q1 | Q2 | Q3 |
|---|---|---|---|---|---|---|---|
| 54 | 3.03 | 0.7106 | 1.24 | 3.99 | 1.71 | 0.16 | 0.07 |
| 55 | .87 | 0.9741 | 1.79 | 0.92 | 0.66 | 0.50 | 0.02 |
| 56 | 9.71 | 0.1032 | 0.67 | 14.76 | 3.27 | 2.76 | 1.77 |
| 57 | 4.34 | 0.5248 | 1.06 | 3.53 | 3.34 | 1.29 | 0.63 |
| 58 | 10.10 | 0.0905 | 0.64 | 6.57 | 5.28 | 5.17* | 4.24* |
| 59 | 4.56 | 0.4957 | 1.03 | 5.69 | 2.81 | 0.99 | 0.11 |
| 60 | 19.98* | 0.0028 | 0.38 | 11.74 | 11.58* | 8.13* | 4.43* |
| 61 | 2.50 | 0.7886 | 1.32 | 3.77 | 1.26 | 0.25 | 0.10 |
| 62 | 14.11* | 0.0226 | 0.53 | 19.43 | 5.93 | 5.51* | 2.45 |
| 63 | 42.53* | 0.0000 | 0.21 | 58.05 | 14.03* | 5.73* | 2.77* |
| 64 | 3.24 | 0.6793 | 1.21 | 3.82 | 2.24 | 0.88 | 0.18 |
| 65 | 2.40 | 0.8027 | 1.39 | 2.04 | 1.48 | 0.77 | 0.31 |
| 66 | 15.54* | 0.0137 | 0.46 | 8.72 | 7.83* | 7.67* | 6.96* |
| 67 | 3.83 | 0.5938 | 1.14 | 1.81 | 1.81 | 1.58 | 0.62 |
| 68 | 3.65 | 0.6201 | 1.18 | 2.67 | 2.40 | 1.46 | 1.37 |
| 69 | 8.81 | 0.1389 | 0.70 | 6.68 | 6.66* | 3.98 | 2.19 |
| 70 | 7.17 | 0.2344 | 0.79 | 6.30 | 6.15 | 3.27 | 0.64 |
| 71 | 2.68 | 0.7615 | 1.34 | 1.07 | 0.90 | 0.73 | 0.45 |
| 72 | 3.09 | 0.7022 | 1.21 | 5.58 | 1.00 | 0.23 | 0.15 |
| 73 | 18.04* | 0.0056 | 0.41 | 19.77 | 11.10* | 3.20 | 1.13 |
| 74 | 3.68 | 0.6163 | 1.14 | 2.04 | 1.98 | 1.56 | 1.25 |
| 75 | 3.58 | 0.6294 | 1.16 | 2.85 | 2.79 | 1.14 | 0.81 |
| 76 | 2.59 | 0.7755 | 1.35 | 0.89 | 0.88 | 0.51 | 0.49 |
| 77 | 4.63 | 0.4866 | 1.03 | 4.14 | 3.66 | 3.37 | 0.12 |
| 78 | 6.18 | 0.3157 | 0.87 | 3.76 | 3.76 | 3.51 | 2.99* |
| 79 | 1.54 | 0.9130 | 1.59 | 0.78 | 0.75 | 0.25 | 0.24 |
| 80 | 2.89 | 0.7317 | 1.27 | 2.59 | 2.13 | 0.16 | 0.16 |
| 81 | 6.27 | 0.3070 | 0.89 | 7.15 | 4.69 | 0.19 | 0.18 |
| 82 | 2.90 | 0.7293 | 1.26 | 2.64 | 2.18 | 0.52 | 0.10 |
| 83 | 3.73 | 0.6080 | 1.11 | 6.39 | 1.38 | 0.86 | 0.15 |
| 84 | 13.42* | 0.0289 | 0.51 | 11.81 | 11.81* | 11.81* | 0.10 |
| 85 | 4.22 | 0.5400 | 1.04 | 7.09 | 1.71 | 1.29 | 0.08 |
| 86 | 2.03 | 0.8529 | 1.46 | 1.94 | 1.66 | 1.29 | 0.02 |
| 87 | 3.60 | 0.6276 | 1.15 | 4.62 | 2.15 | 0.71 | 0.35 |
| 88 | 27.52* | 0.0002 | 0.30 | 29.61 | 14.45* | 4.19 | 4.09* |
| 89 | 12.29* | 0.0429 | 0.56 | 7.62 | 6.94* | 6.84* | 2.88* |
| 90 | 39.90* | 0.0000 | 0.22 | 34.44 | 14.02* | 13.73* | 8.54* |
| 91 | 50.89* | 0.0000 | 0.17 | 19.36 | 18.40* | 17.45* | 13.89* |
| 92 | 2.21 | 0.8289 | 1.42 | 3.11 | 1.22 | 0.17 | 0.16 |
| 93 | 2.90 | 0.7301 | 1.25 | 3.87 | 1.72 | 0.14 | 0.11 |
| 94 | 177.55* | 0.0000 | 0.05 | 171.02 | 33.15* | 30.31* | 27.97* |
| 95 | .92 | 0.9703 | 1.77 | 0.67 | 0.62 | 0.36 | 0.20 |
| 96 | 13.78* | 0.0255 | 0.50 | 10.68 | 9.06* | 7.10* | 4.42* |
| 97 | 5.18 | 0.4194 | 0.95 | 3.87 | 3.10 | 2.47 | 1.40 |
| 98 | 2.25 | 0.8235 | 1.41 | 3.00 | 1.18 | 0.39 | 0.31 |
| 99 | 1.31 | 0.9377 | 1.65 | 0.86 | 0.80 | 0.51 | 0.12 |
| 100 | 17.40* | 0.0070 | 0.44 | 16.38 | 6.65* | 5.98* | 3.55* |
| 101 | 28.52* | 0.0001 | 0.30 | 46.97 | 7.91* | 7.09* | 3.71* |
| 102 | 7.64 | 0.2020 | 0.78 | 6.40 | 5.96 | 4.27 | 1.31 |
| 103 | 21.66* | 0.0015 | 0.35 | 19.14 | 17.62* | 11.64* | 1.07 |
| 104 | 10.93 | 0.0684 | 0.64 | 15.26 | 2.71 | 2.70 | 0.99 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 105 | 5.65 | 0.3684 | 0.92 | 3.21 | 3.12 | 3.06 | 2.78* |
| 106 | 2.58 | 0.7768 | 1.32 | 2.74 | 2.12 | 0.18 | 0.09 |

**Principal Components Report**

Page/Date/Time 6 6/21/2004 9:23:26 PM
Database

**Residual Section**

| Row | T2 | T2 Prob | Weight | Q0 | Q1 | Q2 | Q3 |
|---|---|---|---|---|---|---|---|
| 107 | 2.07 | 0.8478 | 1.46 | 1.13 | 1.12 | 0.84 | 0.39 |
| 108 | 2.64 | 0.7679 | 1.34 | 3.36 | 1.60 | 0.81 | 0.06 |
| 109 | 1.49 | 0.9184 | 1.59 | 1.54 | 0.99 | 0.52 | 0.29 |
| 110 | 3.11 | 0.6989 | 1.21 | 5.18 | 1.23 | 0.54 | 0.18 |
| 111 | 3.00 | 0.7155 | 1.23 | 4.55 | 1.45 | 0.44 | 0.04 |
| 112 | 5.37 | 0.3986 | 0.95 | 3.59 | 3.58 | 0.87 | 0.66 |
| 113 | 4.74 | 0.4729 | 1.00 | 4.44 | 2.84 | 2.11 | 0.53 |
| 114 | 6.56 | 0.2822 | 0.84 | 4.46 | 4.46 | 1.72 | 0.67 |
| 115 | 2.30 | 0.8165 | 1.44 | 2.67 | 1.64 | 0.99 | 0.12 |
| 116 | 2.65 | 0.7665 | 1.30 | 3.89 | 1.56 | 0.03 | 0.01 |
| 117 | 11.84 | 0.0502 | 0.59 | 12.81 | 9.08* | 7.93* | 0.31 |
| 118 | 5.73 | 0.3594 | 0.95 | 6.50 | 1.38 | 1.38 | 0.59 |
| 119 | 1.93 | 0.8661 | 1.50 | 1.51 | 1.34 | 0.61 | 0.60 |
| 120 | 29.02* | 0.0001 | 0.28 | 25.54 | 16.24* | 7.67* | 7.67* |
| 121 | 6.34 | 0.3012 | 0.86 | 6.13 | 2.63 | 2.61 | 0.85 |
| 122 | 3.23 | 0.6810 | 1.22 | 2.39 | 2.01 | 1.99 | 0.75 |
| 123 | 3.03 | 0.7109 | 1.28 | 3.49 | 1.28 | 1.22 | 1.00 |

**Factor Score**

| | Factors | | |
|---|---|---|---|
| **Row** | **Factor1** | **Factor2** | **Factor3** |
| 1 | -0.6299 | 1.0710 | 0.8834 |
| 2 | -0.9324 | 0.8062 | 0.6882 |
| 3 | -0.7307 | 0.0025 | -1.1300 |
| 4 | 0.4800 | 0.7805 | -0.2783 |
| 5 | 0.9416 | -1.0206 | 0.4134 |
| 6 | 0.0012 | 0.8374 | 0.9668 |
| 7 | 0.6360 | 0.8727 | 0.2785 |
| 8 | -1.9582 | 0.7495 | 1.8697 |
| 9 | -0.0845 | 0.5563 | -0.4704 |
| 10 | 0.8841 | 1.2765 | 1.3342 |
| 11 | -0.3235 | 0.8009 | 1.2948 |
| 12 | -0.9416 | 0.2847 | 0.0446 |
| 13 | 0.4779 | -1.1685 | -0.1218 |
| 14 | -0.8466 | 0.5667 | -0.9936 |
| 15 | 1.4450 | -0.8294 | 0.5046 |
| 16 | -0.9710 | 0.2994 | -0.7986 |
| 17 | 0.6792 | -1.0031 | 0.4059 |
| 18 | -19.8885 | -4.3495 | 11.0761 |
| 19 | -1.6106 | 0.2809 | 0.7768 |
| 20 | 0.7801 | -1.0269 | 0.2978 |
| 21 | 0.0480 | -1.3114 | 0.0468 |
| 22 | -0.0895 | 0.5699 | -0.6946 |
| 23 | 1.6338 | -0.5193 | 1.9362 |
| 24 | -2.9158 | -0.7523 | 1.3814 |
| 25 | -0.9424 | 0.5979 | -0.3501 |
| 26 | -0.5804 | 0.3094 | -1.0362 |
| 27 | -1.5750 | -0.0941 | -0.3713 |
| 28 | 1.0811 | 1.1772 | 0.0011 |
| 29 | -0.6919 | 0.4244 | 0.7409 |
| 30 | 0.5861 | 0.9255 | 0.0128 |

| | | | |
|---|---|---|---|
| 31 | -0.9795 | -2.5005 | -0.9279 |
| 32 | 0.1190 | 0.6372 | -1.4478 |
| 33 | 0.2848 | 1.3379 | 1.0837 |
| 34 | -0.9171 | 0.4866 | 0.2786 |
| 35 | -0.8146 | 0.4368 | -0.5535 |
| 36 | 0.4244 | 0.7701 | -1.2728 |
| 37 | 0.4620 | 0.5957 | -0.5574 |
| 38 | 1.1860 | 1.5283 | 1.9676 |
| 39 | 0.3510 | 0.7282 | -1.2584 |
| 40 | -1.1065 | 0.1170 | -1.1162 |
| 41 | -4.8548 | 0.5697 | 3.3366 |
| 42 | -5.1078 | -0.8061 | 1.4945 |
| 43 | 0.5469 | -1.3371 | 0.3550 |
| 44 | -1.1513 | -0.0255 | -0.4480 |

**Factor Score**

| Row | Factors Factor1 | Factor2 | Factor3 |
|---|---|---|---|
| 45 | 1.5742 | -0.7162 | 1.0344 |
| 46 | -0.5413 | 0.7491 | 0.5306 |
| 47 | 0.3472 | -1.0311 | 1.4522 |
| 48 | 0.7272 | 1.4728 | 1.9269 |
| 49 | 0.5933 | 0.7528 | -1.0535 |
| 50 | -0.7734 | -3.2536 | -6.7151 |
| 51 | -0.7413 | 0.7152 | -0.1830 |
| 52 | -2.2818 | -2.1768 | 1.0382 |
| 53 | -1.3950 | 0.2785 | -0.0692 |
| 54 | 0.9774 | -1.2779 | -0.3143 |
| 55 | -0.3261 | 0.4187 | -0.7275 |
| 56 | -2.1967 | -0.7320 | -1.0500 |
| 57 | 0.2817 | -1.4717 | 0.8569 |
| 58 | -0.7381 | -0.3378 | -1.0181 |
| 59 | 1.0993 | 1.3831 | 0.9922 |
| 60 | -0.2552 | -1.9049 | -2.0320 |
| 61 | 1.0255 | -1.0318 | 0.4125 |
| 62 | -2.3806 | 0.6651 | 1.8469 |
| 63 | -4.2986 | -2.9564 | 1.8161 |
| 64 | 0.8152 | 1.1957 | 0.8869 |
| 65 | 0.4847 | 0.8675 | -0.7153 |
| 66 | -0.6119 | -0.4151 | -0.8889 |
| 67 | 0.0247 | 0.4965 | -1.0361 |
| 68 | -0.3394 | 0.9923 | 0.3159 |
| 69 | -0.0864 | -1.6811 | 1.4132 |
| 70 | 0.2479 | -1.7413 | -1.7142 |
| 71 | -0.2682 | 0.4244 | -0.5556 |
| 72 | 1.3872 | -0.9021 | 0.2914 |
| 73 | -1.9078 | -2.8843 | -1.5191 |
| 74 | 0.1586 | 0.6657 | 0.5847 |
| 75 | -0.1641 | -1.3187 | 0.6039 |
| 76 | 0.0612 | 0.6282 | -0.1389 |
| 77 | 0.4459 | 0.5563 | -1.9049 |
| 78 | 0.0233 | 0.5088 | 0.7599 |
| 79 | 0.1052 | 0.7270 | 0.0923 |
| 80 | 0.4410 | -1.4401 | -0.0298 |
| 81 | -1.0159 | -2.1773 | -0.0793 |
| 82 | 0.4401 | -1.3214 | 0.6841 |
| 83 | 1.4495 | -0.7440 | 0.8874 |
| 84 | 0.0055 | -0.0263 | -3.6149 |
| 85 | 1.5028 | -0.6681 | 1.1626 |
| 86 | 0.3456 | 0.6217 | -1.1892 |
| 87 | 1.0189 | -1.2312 | -0.6279 |
| 88 | -2.5229 | -3.2852 | -0.3340 |

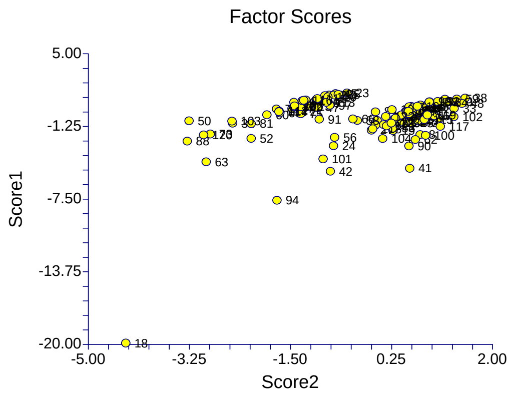
**Factor Score**

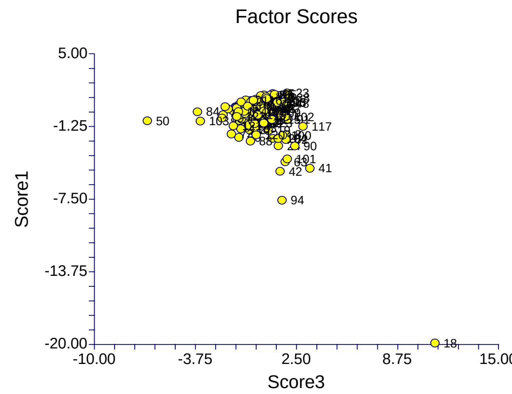
| | Factors | | |
|---|---|---|---|
| **Row** | **Factor1** | **Factor2** | **Factor3** |
| 89 | -0.5321 | 0.3224 | -2.1028 |
| 90 | -2.9280 | 0.5551 | 2.4059 |
| 91 | -0.6342 | -1.0002 | 1.9937 |
| 92 | 0.8906 | 1.0529 | 0.0763 |
| 93 | 0.9499 | -1.2916 | 0.1779 |
| 94 | -7.6079 | -1.7313 | 1.6149 |
| 95 | -0.1489 | 0.5166 | -0.4228 |
| 96 | 0.8234 | -1.4388 | 1.7273 |
| 97 | 0.5685 | -0.8157 | 1.0920 |
| 98 | 0.8740 | 0.9116 | -0.3112 |
| 99 | -0.1479 | 0.5569 | -0.6615 |
| 100 | -2.0214 | 0.8430 | 1.6454 |
| 101 | -4.0494 | -0.9337 | 1.9397 |
| 102 | -0.4316 | 1.3316 | 1.8192 |
| 103 | -0.7989 | -2.5100 | -3.4343 |
| 104 | -2.2959 | 0.0993 | 1.3781 |
| 105 | 0.1902 | 0.2608 | -0.5603 |
| 106 | 0.5116 | -1.4263 | 0.3284 |
| 107 | 0.0463 | 0.5454 | -0.7097 |
| 108 | 0.8609 | 0.9081 | -0.9166 |
| 109 | 0.4826 | 0.7023 | -0.5079 |
| 110 | 1.2884 | -0.8488 | 0.6335 |
| 111 | 1.1406 | -1.0320 | 0.6668 |
| 112 | 0.0608 | -1.6914 | 0.4815 |
| 113 | 0.8204 | -0.8775 | 1.3263 |
| 114 | 0.0144 | -1.6975 | -1.0817 |
| 115 | -0.6599 | 0.8219 | 0.9899 |
| 116 | 0.9900 | -1.2681 | -0.1637 |
| 117 | -1.2515 | 1.0971 | 2.9162 |
| 118 | -1.4658 | -0.0721 | -0.9362 |
| 119 | -0.2668 | 0.8741 | 0.1232 |
| 120 | -1.9763 | -3.0026 | 0.0211 |
| 121 | -1.2109 | 0.1670 | -1.3978 |
| 122 | -0.3990 | 0.1510 | -1.1749 |
| 123 | -0.9628 | 0.2493 | 0.4906 |

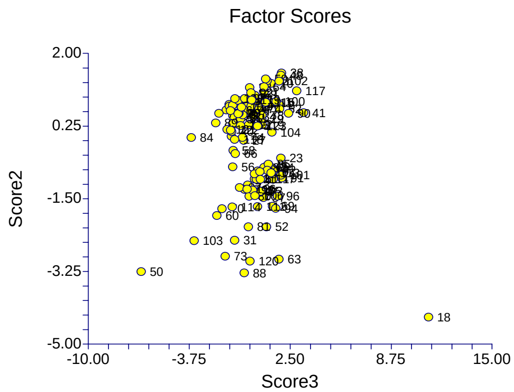
# Principal Components Report

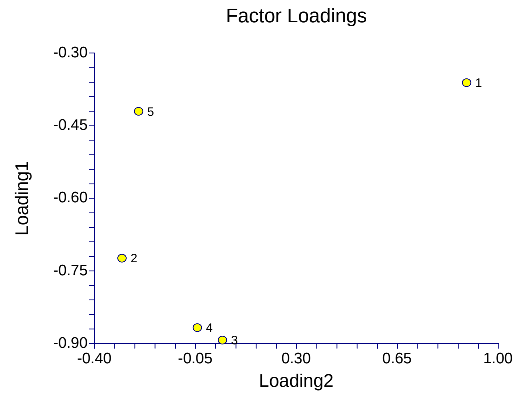
Page/Date/Time 9 6/21/2004 9:23:26 PM
Database

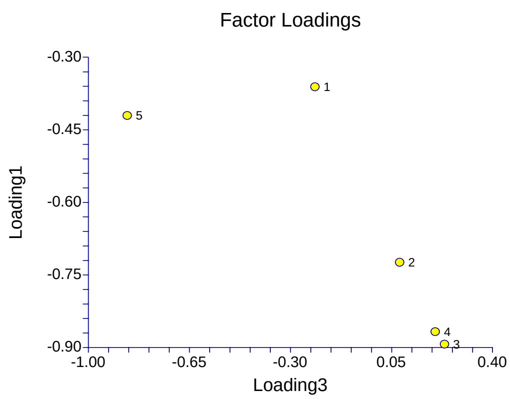
## Plots Section

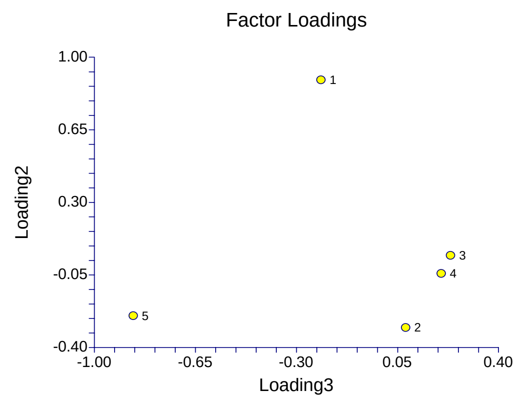


# Appendix A 5-1b

**Principal Components Report**
Page/Date/Time 1 6/21/2004 9:24:19 PM
Database

**Robust and Missing-Value Estimation Iteration Section**

| No. | Count | Trace of Covar Matrix | Percent Change |
|---|---|---|---|
| 0 | 49 | 5.326965E+10 | 0.00 |
| 1 | 49 | 5.326965E+10 | 0.00 |
| 2 | 49 | 1.951417E+10 | -63.37 |
| 3 | 49 | 1.951417E+10 | 0.00 |
| 4 | 49 | 1.357477E+10 | -30.44 |
| 5 | 49 | 1.357477E+10 | 0.00 |
| 6 | 49 | 1.178819E+10 | -13.16 |

**Descriptive Statistics Section**

| Variables | Count | Mean | Standard Deviation | Communality |
|---|---|---|---|---|
| Political_ | 49 | 0.6555167 | 0.4801239 | 0.985901 |
| SEREXP | 49 | 9028.522 | 8265.975 | 0.654247 |
| EXTREV | 49 | 81164.27 | 77500.13 | 0.812026 |
| INVEST | 49 | 84548.73 | 75588.33 | 0.888725 |
| indexx | 49 | 76.72118 | 21.5198 | 0.994171 |

**Correlation Section**

| Variables | Variables Political_ | SEREXP | EXTREV | INVEST | indexx |
|---|---|---|---|---|---|
| Political_ | 1.000000 | -0.000781 | 0.153503 | 0.017309 | -0.027939 |
| SEREXP | -0.000781 | 1.000000 | 0.495612 | 0.649242 | 0.285302 |
| EXTREV | 0.153503 | 0.495612 | 1.000000 | 0.803492 | 0.232392 |
| INVEST | 0.017309 | 0.649242 | 0.803492 | 1.000000 | 0.306961 |
| indexx | -0.027939 | 0.285302 | 0.232392 | 0.306961 | 1.000000 |

Phi=0.395856 Log(Det|R|)=-1.759276 Bartlett Test=80.05 DF=10 Prob=0.000000

**Bar Chart of Absolute Correlation Section**

```
                     Variables
Variables            Political_      SEREXP          EXTREV             INVEST             indexx
Political_                           |               ||||               |                  |
SEREXP               |                               ||||||||||         |||||||||||||      ||||||
EXTREV               ||||            ||||||||||                         |||||||||||||||||  |||||
INVEST               |               |||||||||||||   |||||||||||||||||                     |||||||
indexx               |               ||||||          |||||              |||||||
```

Phi=0.395856 Log(Det|R|)=-1.759276 Bartlett Test=80.05 DF=10 Prob=0.000000

## Principal Components Report

Page/Date/Time 2 6/21/2004 9:24:19 PM
Database

### Eigenvalues

<table>
<tr><th></th><th></th><th>Individual</th><th>Cumulative</th><th></th></tr>
<tr><th>No.</th><th>Eigenvalue</th><th>Percent</th><th>Percent</th><th>Scree Plot</th></tr>
<tr><td>1</td><td>2.466998</td><td>49.34</td><td>49.34</td><td>||||||||||</td></tr>
<tr><td>2</td><td>1.041545</td><td>20.83</td><td>70.17</td><td>|||||</td></tr>
<tr><td>3</td><td>0.826527</td><td>16.53</td><td>86.70</td><td>||||</td></tr>
<tr><td>4</td><td>0.504118</td><td>10.08</td><td>96.78</td><td>|||</td></tr>
<tr><td>5</td><td>0.160813</td><td>3.22</td><td>100.00</td><td>|</td></tr>
</table>

### Eigenvectors

| | Factors | | |
|---|---|---|---|
| **Variables** | **Factor1** | **Factor2** | **Factor3** |
| Political_ | 0.058163 | -0.919774 | -0.341558 |
| SEREXP | 0.505380 | 0.104917 | 0.123904 |
| EXTREV | 0.547943 | -0.189597 | 0.202492 |
| INVEST | 0.588738 | 0.006584 | 0.201585 |
| indexx | 0.307171 | 0.327135 | -0.886762 |

### Bar Chart of Absolute Eigenvectors

<table>
<tr><th></th><th>Factors</th><th></th><th></th></tr>
<tr><th>Variables</th><th>Factor1</th><th>Factor2</th><th>Factor3</th></tr>
<tr><td>Political_</td><td>||</td><td>|||||||||||||||||||</td><td>|||||||</td></tr>
<tr><td>SEREXP</td><td>|||||||||||</td><td>|||</td><td>|||</td></tr>
<tr><td>EXTREV</td><td>|||||||||||</td><td>||||</td><td>|||||</td></tr>
<tr><td>INVEST</td><td>||||||||||||</td><td>|</td><td>|||||</td></tr>
<tr><td>indexx</td><td>|||||||</td><td>|||||||</td><td>||||||||||||||||||</td></tr>
</table>

### Factor Loadings

| | Factors | | |
|---|---|---|---|
| **Variables** | **Factor1** | **Factor2** | **Factor3** |
| Political_ | 0.091355 | -0.938686 | -0.310523 |
| SEREXP | 0.793784 | 0.107074 | 0.112645 |
| EXTREV | 0.860636 | -0.193496 | 0.184093 |
| INVEST | 0.924712 | 0.006719 | 0.183268 |
| indexx | 0.482463 | 0.333862 | -0.806186 |

## Principal Components Report

Page/Date/Time 3 6/21/2004 9:24:19 PM
Database

**Bar Chart of Absolute Factor Loadings**

<table>
<tr><th></th><th>Factors</th><th></th><th></th></tr>
<tr><th>Variables</th><th>Factor1</th><th>Factor2</th><th>Factor3</th></tr>
<tr><td>Political_</td><td>||</td><td>|||||||||||||||||||</td><td>|||||||</td></tr>
<tr><td>SEREXP</td><td>||||||||||||||||</td><td>|||</td><td>|||</td></tr>
<tr><td>EXTREV</td><td>||||||||||||||||||</td><td>||||</td><td>||||</td></tr>
<tr><td>INVEST</td><td>|||||||||||||||||||</td><td>|</td><td>||||</td></tr>
<tr><td>indexx</td><td>||||||||||</td><td>|||||||</td><td>|||||||||||||||||</td></tr>
</table>

**Communalities**

| | Factors | | | |
|---|---|---|---|---|
| **Variables** | **Factor1** | **Factor2** | **Factor3** | **Communality** |
| Political_ | 0.008346 | 0.881131 | 0.096424 | 0.985901 |
| SEREXP | 0.630093 | 0.011465 | 0.012689 | 0.654247 |
| EXTREV | 0.740695 | 0.037441 | 0.033890 | 0.812026 |
| INVEST | 0.855093 | 0.000045 | 0.033587 | 0.888725 |
| indexx | 0.232771 | 0.111464 | 0.649937 | 0.994171 |

**Bar Chart of Communalities**

<table>
<tr><th></th><th>Factors</th><th></th><th></th><th></th></tr>
<tr><th>Variables</th><th>Factor1</th><th>Factor2</th><th>Factor3</th><th>Communality</th></tr>
<tr><td>Political_</td><td>|</td><td>||||||||||||||||||</td><td>||</td><td>||||||||||||||||||||</td></tr>
<tr><td>SEREXP</td><td>|||||||||||||</td><td>|</td><td>|</td><td>||||||||||||||</td></tr>
<tr><td>EXTREV</td><td>|||||||||||||||</td><td>|</td><td>|</td><td>|||||||||||||||||</td></tr>
<tr><td>INVEST</td><td>||||||||||||||||||</td><td>|</td><td>|</td><td>||||||||||||||||||</td></tr>
<tr><td>indexx</td><td>|||||</td><td>|||</td><td>|||||||||||||</td><td>||||||||||||||||||||</td></tr>
</table>

**Factor Structure Summary**

| | Factors | |
|---|---|---|
| **Factor1** | **Factor2** | **Factor3** |
| INVEST | Political_ | indexx |
| EXTREV | | |
| SEREXP | | |

## Principal Components Report

Page/Date/Time 4 6/21/2004 9:24:19 PM
Database

**Residual Section**

| Row | T2 | T2 Prob | Weight | Q0 | Q1 | Q2 | Q3 |
|---|---|---|---|---|---|---|---|
| 1 | 3.07 | 0.7279 | 1.25 | 3.12 | 1.17 | 1.08 | 0.75 |
| 2 | 1.05 | 0.9639 | 1.69 | 1.46 | 0.69 | 0.22 | 0.02 |
| 3 | 2.24 | 0.8383 | 1.36 | 3.62 | 1.20 | 0.15 | 0.04 |
| 4 | 2.08 | 0.8587 | 1.40 | 2.07 | 2.06 | 0.08 | 0.06 |
| 5 | 1.63 | 0.9110 | 1.52 | 2.32 | 0.95 | 0.62 | 0.00 |
| 6 | 5.74 | 0.3996 | 0.92 | 3.58 | 3.56 | 2.13 | 1.72 |
| 7 | 9.84 | 0.1317 | 0.65 | 5.49 | 5.48 | 2.73 | 2.73* |
| 8 | 1.86 | 0.8850 | 1.43 | 2.97 | 1.03 | 0.13 | 0.05 |
| 9 | 6.35 | 0.3423 | 0.91 | 5.41 | 3.05 | 2.57 | 2.08 |
| 10 | 4.92 | 0.4881 | 1.01 | 8.37 | 0.95 | 0.81 | 0.79 |
| 11 | 102.35* | 0.0000 | 0.09 | 112.61 | 20.70* | 19.66* | 17.75* |
| 12 | 1.65 | 0.9084 | 1.51 | 1.19 | 1.05 | 0.84 | 0.30 |
| 13 | 4.07 | 0.5932 | 1.05 | 3.67 | 3.64 | 1.95 | 0.02 |
| 14 | 4.06 | 0.5952 | 1.11 | 3.86 | 2.03 | 1.93 | 0.29 |
| 15 | 13.19 | 0.0507 | 0.50 | 11.83 | 11.73* | 6.32* | 0.11 |
| 16 | 4.40 | 0.5511 | 1.01 | 6.74 | 2.22 | 1.48 | 0.09 |
| 17 | 3.67 | 0.6463 | 1.09 | 5.50 | 2.12 | 0.78 | 0.07 |
| 18 | 6.49 | 0.3295 | 0.84 | 3.83 | 3.43 | 2.26 | 1.63 |
| 19 | 6.36 | 0.3407 | 0.87 | 7.93 | 3.67 | 2.16 | 0.34 |
| 20 | 11.55 | 0.0810 | 0.64 | 18.70 | 2.91 | 1.84 | 0.38 |
| 21 | 2.02 | 0.8659 | 1.41 | 2.16 | 1.10 | 0.40 | 0.37 |
| 22 | 229.66* | 0.0000 | 0.05 | 144.30 | 62.81* | 57.17* | 53.55* |
| 23 | 16.86* | 0.0178 | 0.45 | 13.87 | 8.19* | 3.71 | 3.64* |
| 24 | 4.80 | 0.5022 | 0.97 | 4.86 | 3.12 | 2.54 | 0.51 |
| 25 | 3.21 | 0.7080 | 1.19 | 3.71 | 2.30 | 1.20 | 0.04 |
| 26 | 14.46* | 0.0353 | 0.47 | 24.18 | 5.26 | 5.09* | 0.19 |
| 27 | 2.06 | 0.8618 | 1.42 | 1.20 | 1.20 | 1.00 | 0.65 |
| 28 | 16.90* | 0.0176 | 0.48 | 4.74 | 4.73 | 4.03 | 3.43* |
| 29 | 44.85* | 0.0000 | 0.22 | 27.25 | 9.90* | 9.46* | 6.32* |
| 30 | 2.79 | 0.7664 | 1.26 | 3.16 | 2.61 | 0.16 | 0.02 |
| 31 | 1.57 | 0.9173 | 1.54 | 2.20 | 0.82 | 0.20 | 0.12 |
| 32 | 3.54 | 0.6639 | 1.11 | 3.71 | 2.75 | 1.36 | 0.19 |
| 33 | 13.78* | 0.0428 | 0.48 | 10.79 | 10.79* | 10.70* | 0.68 |
| 34 | 3.38 | 0.6854 | 1.16 | 3.10 | 3.10 | 0.37 | 0.07 |
| 35 | 5.57 | 0.4171 | 0.93 | 4.52 | 2.79 | 1.13 | 0.40 |
| 36 | 13.68* | 0.0441 | 0.53 | 11.71 | 6.46 | 4.97* | 4.45* |
| 37 | 2.98 | 0.7401 | 1.24 | 3.57 | 1.91 | 1.73 | 0.04 |
| 38 | 2.38 | 0.8211 | 1.35 | 1.62 | 1.40 | 0.93 | 0.92 |
| 39 | 3.90 | 0.6154 | 1.08 | 4.48 | 2.89 | 0.68 | 0.40 |
| 40 | 4.92 | 0.4879 | 0.99 | 3.33 | 2.49 | 2.15 | 2.08 |
| 41 | 1.14 | 0.9568 | 1.69 | 1.27 | 0.87 | 0.16 | 0.05 |
| 42 | 2.41 | 0.8166 | 1.34 | 1.86 | 1.79 | 1.64 | 0.22 |
| 43 | 123.88* | 0.0000 | 0.07 | 231.90 | 19.86* | 19.72* | 12.55* |
| 44 | 2.62 | 0.7888 | 1.29 | 3.55 | 2.04 | 0.06 | 0.05 |
| 45 | 5.33 | 0.4425 | 0.98 | 2.14 | 1.37 | 0.79 | 0.71 |
| 46 | 4.32 | 0.5614 | 1.10 | 5.88 | 2.34 | 0.84 | 0.31 |
| 47 | 6.98 | 0.2898 | 0.84 | 3.06 | 2.97 | 1.47 | 1.01 |
| 48 | 2.32 | 0.8287 | 1.39 | 1.66 | 1.05 | 0.93 | 0.19 |
| 49 | 3.59 | 0.6572 | 1.12 | 4.68 | 2.13 | 1.25 | 0.05 |

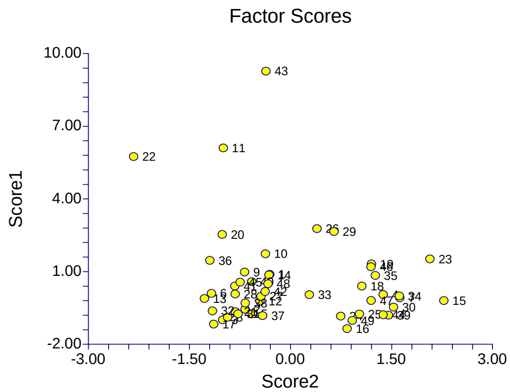
**Factor Score**

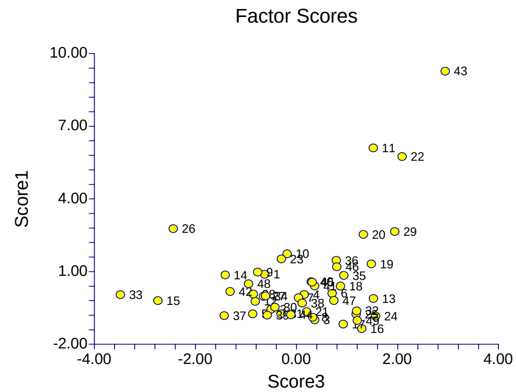
| Row | Factors Factor1 | Factor2 | Factor3 |
|---|---|---|---|
| 1 | 0.8872 | -0.3051 | -0.6243 |
| 2 | -0.5587 | -0.6710 | -0.4983 |
| 3 | -0.9904 | -1.0042 | 0.3630 |
| 4 | 0.0536 | 1.3784 | 0.1576 |
| 5 | -0.7450 | -0.5631 | -0.8647 |
| 6 | 0.0994 | -1.1710 | 0.7092 |
| 7 | -0.0824 | 1.6243 | 0.0419 |
| 8 | -0.8849 | -0.9304 | 0.3248 |
| 9 | 0.9782 | -0.6789 | -0.7663 |
| 10 | 1.7336 | -0.3691 | -0.1811 |
| 11 | 6.1039 | -0.9957 | 1.5224 |
| 12 | -0.2337 | -0.4501 | -0.8118 |
| 13 | -0.1124 | -1.2755 | 1.5275 |
| 14 | 0.8598 | -0.3171 | -1.4071 |
| 15 | -0.1986 | 2.2782 | -2.7415 |
| 16 | -1.3544 | 0.8434 | 1.2967 |
| 17 | -1.1691 | -1.1369 | 0.9283 |
| 18 | 0.3988 | 1.0623 | 0.8737 |
| 19 | 1.3142 | 1.2047 | 1.4851 |
| 20 | 2.5305 | -1.0117 | 1.3288 |
| 21 | -0.6573 | -0.8173 | 0.2041 |
| 22 | 5.7474 | -2.3267 | 2.0937 |
| 23 | 1.5181 | 2.0731 | -0.2950 |
| 24 | -0.8386 | 0.7489 | 1.5679 |
| 25 | -0.7563 | 1.0261 | 1.1842 |
| 26 | 2.7696 | 0.3957 | -2.4352 |
| 27 | -0.0236 | -0.4366 | -0.6526 |
| 28 | 0.0714 | -0.8183 | -0.8494 |
| 29 | 2.6524 | 0.6487 | 1.9496 |
| 30 | -0.4719 | 1.5322 | -0.4223 |
| 31 | -0.7460 | -0.7759 | -0.3040 |
| 32 | -0.6237 | -1.1553 | 1.1946 |
| 33 | 0.0478 | 0.2817 | -3.4824 |
| 34 | -0.0061 | 1.6181 | -0.6094 |
| 35 | 0.8379 | 1.2614 | 0.9393 |
| 36 | 1.4594 | -1.1953 | 0.7919 |
| 37 | -0.8221 | -0.4114 | -1.4276 |
| 38 | -0.3005 | -0.6681 | 0.1155 |
| 39 | -0.8025 | 1.4568 | -0.5752 |
| 40 | 0.5812 | -0.5728 | 0.2958 |
| 41 | 0.4010 | -0.8237 | 0.3628 |
| 42 | 0.1747 | -0.3746 | -1.3108 |
| 43 | 9.2709 | -0.3625 | 2.9467 |
| 44 | -0.7836 | 1.3797 | -0.1107 |

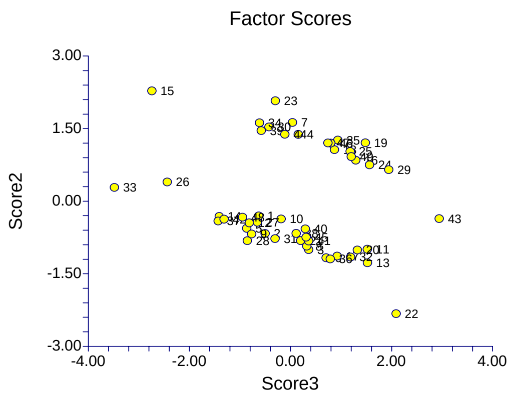
## Factor Score

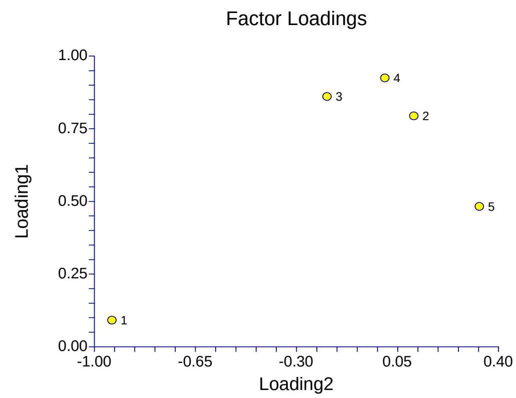
| Row | Factors Factor1 | Factor2 | Factor3 |
|---|---|---|---|
| 45 | 0.5597 | -0.7465 | 0.3120 |
| 46 | 1.1980 | 1.1973 | 0.8009 |
| 47 | -0.1963 | 1.2005 | 0.7443 |
| 48 | 0.4976 | -0.3323 | -0.9451 |
| 49 | -1.0167 | 0.9189 | 1.2073 |

## Plots Section



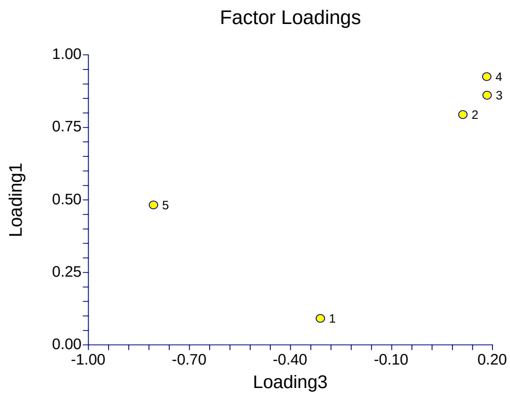



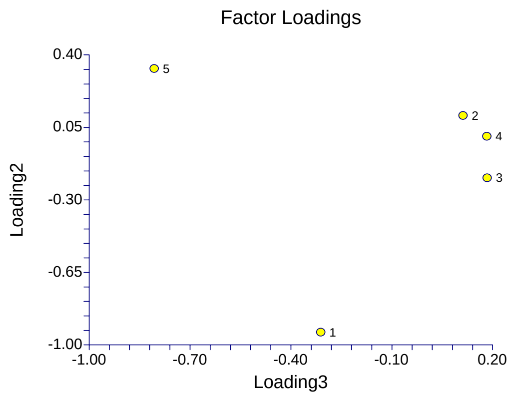



**Principal Components Report**

Page/Date/Time 7 6/21/2004 9:24:19 PM
Database



**Fuzzy Clustering Report**

Page/Date/Time 1 4/14/2005 11:44:56 PM
Database
Variables StdFactor1MulSqrtEV1, StdFactor2MulSqrtEV2, StdFactor3MulSqrtEV3
Distance Type Euclidean
Scale Type None

**Cluster Medoids Section**

| Variable | Cluster1 | Cluster2 |
|---|---|---|
| StdFactor1MulSqrtEV1 | 0.2525866 | 0.7243785 |
| StdFactor2MulSqrtEV2 | 0.6037828 | -0.8898659 |
| StdFactor3MulSqrtEV3 | -0.339343 | 0.1042105 |
| Row | 95 135 | 43 64 |

**Membership Summary Section for Clusters = 2**

| Row | Cluster | Cluster Membership | Sum of Squared Memberships | Bar of Squared Memberships | Silhouette Amount | Silhouette Bar |
|---|---|---|---|---|---|---|
| 95 135 | 1 | 0.9388 | 0.8850 | \|IIIIIIIIIIIIIIIIIIIIIIIIIII | 0.6301 | \|IIIIIIIIIIIIIIIIIII |
| 9 12 | 1 | 0.9384 | 0.8844 | \|IIIIIIIIIIIIIIIIIIIIIIIIIII | 0.6317 | \|IIIIIIIIIIIIIIIIIII |
| 119 164 | 1 | 0.9353 | 0.8789 | \|IIIIIIIIIIIIIIIIIIIIIIIIII | 0.6435 | \|IIIIIIIIIIIIIIIIIII |
| 99 140 | 1 | 0.9346 | 0.8778 | \|IIIIIIIIIIIIIIIIIIIIIIIIII | 0.6293 | \|IIIIIIIIIIIIIIIIIII |
| 22 34 | 1 | 0.9316 | 0.8726 | \|IIIIIIIIIIIIIIIIIIIIIIIIII | 0.6271 | \|IIIIIIIIIIIIIIIIIII |
| 76 113 | 1 | 0.9314 | 0.8723 | \|IIIIIIIIIIIIIIIIIIIIIIIIII | 0.6276 | \|IIIIIIIIIIIIIIIIIII |
| 51 75 | 1 | 0.9306 | 0.8708 | \|IIIIIIIIIIIIIIIIIIIIIIIIII | 0.6347 | \|IIIIIIIIIIIIIIIIIII |
| 71 103 | 1 | 0.9297 | 0.8692 | \|IIIIIIIIIIIIIIIIIIIIIIIIII | 0.6190 | \|IIIIIIIIIIIIIIIIIII |
| 79 117 | 1 | 0.9229 | 0.8577 | \|IIIIIIIIIIIIIIIIIIIIIIIIII | 0.6247 | \|IIIIIIIIIIIIIIIIIII |
| 68 99 | 1 | 0.9215 | 0.8553 | \|IIIIIIIIIIIIIIIIIIIIIIIIII | 0.6355 | \|IIIIIIIIIIIIIIIIIII |
| 107 149 | 1 | 0.9214 | 0.8551 | \|IIIIIIIIIIIIIIIIIIIIIIIIII | 0.6167 | \|IIIIIIIIIIIIIIIIIII |
| 55 83 | 1 | 0.9214 | 0.8551 | \|IIIIIIIIIIIIIIIIIIIIIIIIII | 0.6130 | \|IIIIIIIIIIIIIIIIII |
| 25 37 | 1 | 0.9123 | 0.8400 | \|IIIIIIIIIIIIIIIIIIIIIIIII | 0.6150 | \|IIIIIIIIIIIIIIIIII |
| 35 52 | 1 | 0.9097 | 0.8357 | \|IIIIIIIIIIIIIIIIIIIIIIIII | 0.6066 | \|IIIIIIIIIIIIIIIIII |
| 46 68 | 1 | 0.9082 | 0.8332 | \|IIIIIIIIIIIIIIIIIIIIIIIII | 0.6161 | \|IIIIIIIIIIIIIIIIII |
| 4 4 | 1 | 0.8937 | 0.8100 | \|IIIIIIIIIIIIIIIIIIIIIIII | 0.6023 | \|IIIIIIIIIIIIIIIIII |
| 67 98 | 1 | 0.8924 | 0.8079 | \|IIIIIIIIIIIIIIIIIIIIIIII | 0.5924 | \|IIIIIIIIIIIIIIIIII |
| 34 49 | 1 | 0.8898 | 0.8039 | \|IIIIIIIIIIIIIIIIIIIIIIII | 0.5927 | \|IIIIIIIIIIIIIIIIII |
| 14 20 | 1 | 0.8895 | 0.8034 | \|IIIIIIIIIIIIIIIIIIIIIIII | 0.5948 | \|IIIIIIIIIIIIIIIIII |
| 109 151 | 1 | 0.8890 | 0.8026 | \|IIIIIIIIIIIIIIIIIIIIIIII | 0.5956 | \|IIIIIIIIIIIIIIIIII |
| 65 95 | 1 | 0.8851 | 0.7965 | \|IIIIIIIIIIIIIIIIIIIIIIII | 0.5979 | \|IIIIIIIIIIIIIIIIII |
| 37 55 | 1 | 0.8822 | 0.7921 | \|IIIIIIIIIIIIIIIIIIIIIIII | 0.5865 | \|IIIIIIIIIIIIIIIIII |
| 26 38 | 1 | 0.8767 | 0.7838 | \|IIIIIIIIIIIIIIIIIIIIIIII | 0.5762 | \|IIIIIIIIIIIIIIIII |
| 30 42 | 1 | 0.8737 | 0.7792 | \|IIIIIIIIIIIIIIIIIIIIIII | 0.5914 | \|IIIIIIIIIIIIIIIIII |
| 2 2 | 1 | 0.8734 | 0.7789 | \|IIIIIIIIIIIIIIIIIIIIIII | 0.5905 | \|IIIIIIIIIIIIIIIIII |
| 74 107 | 1 | 0.8718 | 0.7764 | \|IIIIIIIIIIIIIIIIIIIIIII | 0.5831 | \|IIIIIIIIIIIIIIIII |
| 12 15 | 1 | 0.8711 | 0.7755 | \|IIIIIIIIIIIIIIIIIIIIIII | 0.5714 | \|IIIIIIIIIIIIIIIII |
| 1 1 | 1 | 0.8689 | 0.7722 | \|IIIIIIIIIIIIIIIIIIIIIII | 0.5936 | \|IIIIIIIIIIIIIIIIII |
| 16 22 | 1 | 0.8669 | 0.7693 | \|IIIIIIIIIIIIIIIIIIIIIII | 0.5694 | \|IIIIIIIIIIIIIIIII |
| 105 147 | 1 | 0.8592 | 0.7580 | \|IIIIIIIIIIIIIIIIIIIIIII | 0.5581 | \|IIIIIIIIIIIIIIIII |
| 86 126 | 1 | 0.8590 | 0.7578 | \|IIIIIIIIIIIIIIIIIIIIIII | 0.5702 | \|IIIIIIIIIIIIIIIII |
| 39 58 | 1 | 0.8581 | 0.7565 | \|IIIIIIIIIIIIIIIIIIIIIII | 0.5722 | \|IIIIIIIIIIIIIIIII |
| 115 158 | 1 | 0.8567 | 0.7544 | \|IIIIIIIIIIIIIIIIIIIIIII | 0.5781 | \|IIIIIIIIIIIIIIIII |
| 32 46 | 1 | 0.8506 | 0.7459 | \|IIIIIIIIIIIIIIIIIIIIII | 0.5640 | \|IIIIIIIIIIIIIIIII |
| 36 54 | 1 | 0.8501 | 0.7451 | \|IIIIIIIIIIIIIIIIIIIIII | 0.5666 | \|IIIIIIIIIIIIIIIII |

## Fuzzy Clustering Report

Page/Date/Time 2 4/14/2005 11:44:56 PM
Database
Variables StdFactor1MulSqrtEV1, StdFactor2MulSqrtEV2, StdFactor3MulSqrtEV3
Distance Type Euclidean
Scale Type None

**Membership Summary Section for Clusters = 2**

<table>
<tr><th>Row</th><th>Cluster</th><th>Cluster Membership</th><th>Sum of Squared Memberships</th><th>Bar of Squared Memberships</th><th>Silhouette Amount</th><th>Silhouette Bar</th></tr>
<tr><td>7 10</td><td>1</td><td>0.8498</td><td>0.7447</td><td>|IIIIIIIIIIIIIIIIIIIIII</td><td>0.5722</td><td>|IIIIIIIIIIIIIIIII</td></tr>
<tr><td>6 7</td><td>1</td><td>0.8492</td><td>0.7439</td><td>|IIIIIIIIIIIIIIIIIIIIII</td><td>0.5729</td><td>|IIIIIIIIIIIIIIIII</td></tr>
<tr><td>29 41</td><td>1</td><td>0.8468</td><td>0.7406</td><td>|IIIIIIIIIIIIIIIIIIIIII</td><td>0.5592</td><td>|IIIIIIIIIIIIIIIII</td></tr>
<tr><td>49 73</td><td>1</td><td>0.8462</td><td>0.7398</td><td>|IIIIIIIIIIIIIIIIIIIIII</td><td>0.5634</td><td>|IIIIIIIIIIIIIIIII</td></tr>
<tr><td>78 115</td><td>1</td><td>0.8380</td><td>0.7285</td><td>|IIIIIIIIIIIIIIIIIIIIII</td><td>0.5549</td><td>|IIIIIIIIIIIIIIIII</td></tr>
<tr><td>98 139</td><td>1</td><td>0.8312</td><td>0.7194</td><td>|IIIIIIIIIIIIIIIIIIIIII</td><td>0.5568</td><td>|IIIIIIIIIIIIIIIII</td></tr>
<tr><td>122 171</td><td>1</td><td>0.8299</td><td>0.7177</td><td>|IIIIIIIIIIIIIIIIIIIIII</td><td>0.5374</td><td>|IIIIIIIIIIIIIIII</td></tr>
<tr><td>123 172</td><td>1</td><td>0.8242</td><td>0.7102</td><td>|IIIIIIIIIIIIIIIIIIIII</td><td>0.5380</td><td>|IIIIIIIIIIIIIIII</td></tr>
<tr><td>92 132</td><td>1</td><td>0.8233</td><td>0.7090</td><td>|IIIIIIIIIIIIIIIIIIIII</td><td>0.5546</td><td>|IIIIIIIIIIIIIIIII</td></tr>
<tr><td>53 80</td><td>1</td><td>0.8184</td><td>0.7028</td><td>|IIIIIIIIIIIIIIIIIIIII</td><td>0.5327</td><td>|IIIIIIIIIIIIIIII</td></tr>
<tr><td>108 150</td><td>1</td><td>0.8178</td><td>0.7020</td><td>|IIIIIIIIIIIIIIIIIIIII</td><td>0.5440</td><td>|IIIIIIIIIIIIIIII</td></tr>
<tr><td>33 47</td><td>1</td><td>0.8160</td><td>0.6997</td><td>|IIIIIIIIIIIIIIIIIIIII</td><td>0.5555</td><td>|IIIIIIIIIIIIIIIII</td></tr>
<tr><td>11 14</td><td>1</td><td>0.8131</td><td>0.6960</td><td>|IIIIIIIIIIIIIIIIIIIII</td><td>0.5452</td><td>|IIIIIIIIIIIIIIII</td></tr>
<tr><td>40 60</td><td>1</td><td>0.7954</td><td>0.6746</td><td>|IIIIIIIIIIIIIIIIIIII</td><td>0.5115</td><td>|IIIIIIIIIIIIIII</td></tr>
<tr><td>28 40</td><td>1</td><td>0.7942</td><td>0.6731</td><td>|IIIIIIIIIIIIIIIIIIII</td><td>0.5321</td><td>|IIIIIIIIIIIIIIII</td></tr>
<tr><td>3 3</td><td>1</td><td>0.7871</td><td>0.6648</td><td>|IIIIIIIIIIIIIIIIIIII</td><td>0.5050</td><td>|IIIIIIIIIIIIIII</td></tr>
<tr><td>64 93</td><td>1</td><td>0.7826</td><td>0.6597</td><td>|IIIIIIIIIIIIIIIIIIII</td><td>0.5268</td><td>|IIIIIIIIIIIIIIII</td></tr>
<tr><td>44 65</td><td>1</td><td>0.7773</td><td>0.6537</td><td>|IIIIIIIIIIIIIIIIIIII</td><td>0.4980</td><td>|IIIIIIIIIIIIIII</td></tr>
<tr><td>121 168</td><td>1</td><td>0.7718</td><td>0.6478</td><td>|IIIIIIIIIIIIIIIIIII</td><td>0.4917</td><td>|IIIIIIIIIIIIIII</td></tr>
<tr><td>102 143</td><td>1</td><td>0.7610</td><td>0.6363</td><td>|IIIIIIIIIIIIIIIIIII</td><td>0.5065</td><td>|IIIIIIIIIIIIIII</td></tr>
<tr><td>77 114</td><td>1</td><td>0.7583</td><td>0.6334</td><td>|IIIIIIIIIIIIIIIIIII</td><td>0.4874</td><td>|IIIIIIIIIIIIIII</td></tr>
<tr><td>89 129</td><td>1</td><td>0.7486</td><td>0.6236</td><td>|IIIIIIIIIIIIIIIIIII</td><td>0.4734</td><td>|IIIIIIIIIIIIII</td></tr>
<tr><td>59 87</td><td>1</td><td>0.7413</td><td>0.6165</td><td>|IIIIIIIIIIIIIIIIII</td><td>0.4918</td><td>|IIIIIIIIIIIIIII</td></tr>
<tr><td>19 29</td><td>1</td><td>0.7361</td><td>0.6115</td><td>|IIIIIIIIIIIIIIIIII</td><td>0.4709</td><td>|IIIIIIIIIIIIII</td></tr>
<tr><td>10 13</td><td>1</td><td>0.7358</td><td>0.6112</td><td>|IIIIIIIIIIIIIIIIII</td><td>0.4885</td><td>|IIIIIIIIIIIIIII</td></tr>
<tr><td>118 163</td><td>1</td><td>0.7210</td><td>0.5977</td><td>|IIIIIIIIIIIIIIIIII</td><td>0.4503</td><td>|IIIIIIIIIIIIII</td></tr>
<tr><td>27 39</td><td>1</td><td>0.7094</td><td>0.5877</td><td>|IIIIIIIIIIIIIIIIII</td><td>0.4432</td><td>|IIIIIIIIIIIII</td></tr>
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<tr><td>100 141</td><td>1</td><td>0.6955</td><td>0.5764</td><td>|IIIIIIIIIIIIIIIII</td><td>0.4335</td><td>|IIIIIIIIIIIII</td></tr>
<tr><td>8 11</td><td>1</td><td>0.6752</td><td>0.5614</td><td>|IIIIIIIIIIIIIIIII</td><td>0.4148</td><td>|IIIIIIIIIIII</td></tr>
<tr><td>38 56</td><td>1</td><td>0.6656</td><td>0.5549</td><td>|IIIIIIIIIIIIIIIII</td><td>0.4179</td><td>|IIIIIIIIIIIII</td></tr>
<tr><td>58 86</td><td>1</td><td>0.6515</td><td>0.5459</td><td>|IIIIIIIIIIIIIIII</td><td>0.4108</td><td>|IIIIIIIIIIII</td></tr>
<tr><td>62 91</td><td>1</td><td>0.6454</td><td>0.5423</td><td>|IIIIIIIIIIIIIIII</td><td>0.3757</td><td>|IIIIIIIIIII</td></tr>
<tr><td>117 161</td><td>1</td><td>0.6390</td><td>0.5386</td><td>|IIIIIIIIIIIIIIII</td><td>0.3773</td><td>|IIIIIIIIIII</td></tr>
<tr><td>104 146</td><td>1</td><td>0.6078</td><td>0.5232</td><td>|IIIIIIIIIIIIIIII</td><td>0.3393</td><td>|IIIIIIIIII</td></tr>
<tr><td>66 97</td><td>1</td><td>0.6052</td><td>0.5221</td><td>|IIIIIIIIIIIIIIII</td><td>0.3846</td><td>|IIIIIIIIIIII</td></tr>
<tr><td>90 130</td><td>1</td><td>0.5858</td><td>0.5147</td><td>|IIIIIIIIIIIIIII</td><td>0.2887</td><td>|IIIIIIIII</td></tr>
<tr><td>84 124</td><td>1</td><td>0.5774</td><td>0.5120</td><td>|IIIIIIIIIIIIIII</td><td>0.2842</td><td>|IIIIIIIII</td></tr>
<tr><td>41 61</td><td>1</td><td>0.5308</td><td>0.5019</td><td>|IIIIIIIIIIIIIII</td><td>0.1509</td><td>|IIIII</td></tr>
<tr><td>56 84</td><td>1</td><td>0.5151</td><td>0.5005</td><td>|IIIIIIIIIIIIIII</td><td>0.2271</td><td>|IIIIIII</td></tr>
<tr><td>43 64</td><td>2</td><td>0.9380</td><td>0.8836</td><td>|IIIIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.1912</td><td>|IIIIII</td></tr>
<tr><td>106 148</td><td>2</td><td>0.9369</td><td>0.8817</td><td>|IIIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.2084</td><td>|IIIIII</td></tr>
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**Fuzzy Clustering Report**

Page/Date/Time 3 4/14/2005 11:44:56 PM
Database
Variables StdFactor1MulSqrtEV1, StdFactor2MulSqrtEV2, StdFactor3MulSqrtEV3
Distance Type Euclidean
Scale Type None

**Membership Summary Section for Clusters = 2**

<table>
<tr><th>Row</th><th>Cluster</th><th>Cluster Membership</th><th>Sum of Squared Memberships</th><th>Bar of Squared Memberships</th><th>Silhouette Amount</th><th>Silhouette Bar</th></tr>
<tr><td>82 121</td><td>2</td><td>0.9331</td><td>0.8751</td><td>|||||||||||||||||||||||||||</td><td>0.1863</td><td>|||||||</td></tr>
<tr><td>80 118</td><td>2</td><td>0.9242</td><td>0.8599</td><td>|||||||||||||||||||||||||||</td><td>0.1855</td><td>|||||||</td></tr>
<tr><td>57 85</td><td>2</td><td>0.9225</td><td>0.8571</td><td>|||||||||||||||||||||||||||</td><td>0.2074</td><td>|||||||</td></tr>
<tr><td>93 133</td><td>2</td><td>0.9185</td><td>0.8503</td><td>|||||||||||||||||||||||||||</td><td>0.1774</td><td>||||||</td></tr>
<tr><td>17 26</td><td>2</td><td>0.9174</td><td>0.8485</td><td>||||||||||||||||||||||||||</td><td>0.0893</td><td>||||</td></tr>
<tr><td>20 31</td><td>2</td><td>0.9165</td><td>0.8469</td><td>||||||||||||||||||||||||||</td><td>0.1001</td><td>||||</td></tr>
<tr><td>112 154</td><td>2</td><td>0.9150</td><td>0.8445</td><td>||||||||||||||||||||||||||</td><td>0.2280</td><td>||||||||</td></tr>
<tr><td>5 6</td><td>2</td><td>0.9102</td><td>0.8365</td><td>||||||||||||||||||||||||||</td><td>0.1106</td><td>||||</td></tr>
<tr><td>13 19</td><td>2</td><td>0.9085</td><td>0.8338</td><td>||||||||||||||||||||||||||</td><td>0.0964</td><td>||||</td></tr>
<tr><td>21 32</td><td>2</td><td>0.9077</td><td>0.8325</td><td>||||||||||||||||||||||||||</td><td>0.1174</td><td>|||||</td></tr>
<tr><td>61 90</td><td>2</td><td>0.9053</td><td>0.8285</td><td>||||||||||||||||||||||||||</td><td>0.1154</td><td>||||</td></tr>
<tr><td>75 110</td><td>2</td><td>0.8978</td><td>0.8165</td><td>|||||||||||||||||||||||||</td><td>0.1199</td><td>|||||</td></tr>
<tr><td>116 159</td><td>2</td><td>0.8964</td><td>0.8143</td><td>|||||||||||||||||||||||||</td><td>0.1445</td><td>|||||</td></tr>
<tr><td>111 153</td><td>2</td><td>0.8927</td><td>0.8084</td><td>|||||||||||||||||||||||||</td><td>0.1209</td><td>|||||</td></tr>
<tr><td>54 82</td><td>2</td><td>0.8849</td><td>0.7963</td><td>|||||||||||||||||||||||||</td><td>0.1321</td><td>|||||</td></tr>
<tr><td>69 101</td><td>2</td><td>0.8692</td><td>0.7726</td><td>||||||||||||||||||||||||</td><td>0.1993</td><td>|||||||</td></tr>
<tr><td>97 138</td><td>2</td><td>0.8590</td><td>0.7578</td><td>||||||||||||||||||||||||</td><td>0.0074</td><td>|</td></tr>
<tr><td>47 71</td><td>2</td><td>0.8581</td><td>0.7565</td><td>||||||||||||||||||||||||</td><td>0.0715</td><td>|||</td></tr>
<tr><td>96 136</td><td>2</td><td>0.8545</td><td>0.7514</td><td>||||||||||||||||||||||||</td><td>0.1758</td><td>||||||</td></tr>
<tr><td>110 152</td><td>2</td><td>0.8544</td><td>0.7512</td><td>||||||||||||||||||||||||</td><td>0.0544</td><td>|||</td></tr>
<tr><td>113 155</td><td>2</td><td>0.8508</td><td>0.7461</td><td>|||||||||||||||||||||||</td><td>0.0509</td><td>|||</td></tr>
<tr><td>72 104</td><td>2</td><td>0.8458</td><td>0.7392</td><td>|||||||||||||||||||||||</td><td>0.0549</td><td>|||</td></tr>
<tr><td>87 127</td><td>2</td><td>0.8443</td><td>0.7370</td><td>|||||||||||||||||||||||</td><td>0.0831</td><td>|||</td></tr>
<tr><td>15 21</td><td>2</td><td>0.8321</td><td>0.7206</td><td>|||||||||||||||||||||||</td><td>0.0390</td><td>||</td></tr>
<tr><td>114 156</td><td>2</td><td>0.8186</td><td>0.7030</td><td>||||||||||||||||||||||</td><td>0.1240</td><td>|||||</td></tr>
<tr><td>83 122</td><td>2</td><td>0.8120</td><td>0.6947</td><td>||||||||||||||||||||||</td><td>0.0184</td><td>||</td></tr>
<tr><td>81 120</td><td>2</td><td>0.8083</td><td>0.6901</td><td>||||||||||||||||||||||</td><td>0.1978</td><td>|||||||</td></tr>
<tr><td>45 67</td><td>2</td><td>0.7883</td><td>0.6662</td><td>|||||||||||||||||||||</td><td>0.0083</td><td>|</td></tr>
<tr><td>85 125</td><td>2</td><td>0.7801</td><td>0.6569</td><td>|||||||||||||||||||||</td><td>-0.0087</td><td>|</td></tr>
<tr><td>31 43</td><td>2</td><td>0.7741</td><td>0.6502</td><td>|||||||||||||||||||||</td><td>0.2033</td><td>|||||||</td></tr>
<tr><td>70 102</td><td>2</td><td>0.7598</td><td>0.6349</td><td>||||||||||||||||||||</td><td>0.0900</td><td>||||</td></tr>
<tr><td>120 165</td><td>2</td><td>0.7287</td><td>0.6046</td><td>|||||||||||||||||||</td><td>0.2138</td><td>|||||||</td></tr>
<tr><td>91 131</td><td>2</td><td>0.7266</td><td>0.6027</td><td>|||||||||||||||||||</td><td>-0.0366</td><td>|</td></tr>
<tr><td>60 89</td><td>2</td><td>0.7244</td><td>0.6007</td><td>|||||||||||||||||||</td><td>0.0847</td><td>||||</td></tr>
<tr><td>52 77</td><td>2</td><td>0.7016</td><td>0.5812</td><td>||||||||||||||||||</td><td>0.1296</td><td>|||||</td></tr>
<tr><td>23 35</td><td>2</td><td>0.6990</td><td>0.5792</td><td>||||||||||||||||||</td><td>-0.0593</td><td>|</td></tr>
<tr><td>73 105</td><td>2</td><td>0.6966</td><td>0.5773</td><td>||||||||||||||||||</td><td>0.1693</td><td>||||||</td></tr>
<tr><td>88 128</td><td>2</td><td>0.6919</td><td>0.5737</td><td>||||||||||||||||||</td><td>0.1953</td><td>|||||||</td></tr>
<tr><td>103 144</td><td>2</td><td>0.6446</td><td>0.5418</td><td>|||||||||||||||||</td><td>0.0833</td><td>|||</td></tr>
<tr><td>63 92</td><td>2</td><td>0.6151</td><td>0.5265</td><td>|||||||||||||||||</td><td>0.1162</td><td>||||</td></tr>
<tr><td>50 74</td><td>2</td><td>0.5714</td><td>0.5102</td><td>||||||||||||||||</td><td>0.0421</td><td>||</td></tr>
<tr><td>101 142</td><td>2</td><td>0.5354</td><td>0.5025</td><td>||||||||||||||||</td><td>-0.0812</td><td>|</td></tr>
</table>

## Fuzzy Clustering Report

| | |
|---|---|
| Page/Date/Time | 4 4/14/2005 11:44:56 PM |
| Database | |
| Variables | StdFactor1MulSqrtEV1, StdFactor2MulSqrtEV2, StdFactor3MulSqrtEV3 |
| Distance Type | Euclidean |
| Scale Type | None |

**Membership Summary Section for Clusters = 2**

| Row | Cluster | Cluster Membership | Sum of Squared Memberships | Bar of Squared Memberships | Silhouette Amount | Silhouette Bar |
|---|---|---|---|---|---|---|
| 24 36 | 2 | 0.5309 | 0.5019 | \|IIIIIIIIIIIIIII | -0.1561 | \| |
| 94 134 | 2 | 0.5286 | 0.5016 | \|IIIIIIIIIIIIIII | 0.0007 | \| |
| 42 63 | 2 | 0.5159 | 0.5005 | \|IIIIIIIIIIIIIII | -0.0803 | \| |
| 18 27 | 2 | 0.5147 | 0.5004 | \|IIIIIIIIIIIIIII | 0.0200 | \|I |

**Membership Matrix Section**

| Row | Cluster | Prob in 1 | Prob in 2 |
|---|---|---|---|
| 1 1 | 1 | 0.8689 | 0.1311 |
| 2 2 | 1 | 0.8734 | 0.1266 |
| 3 3 | 1 | 0.7871 | 0.2129 |
| 4 4 | 1 | 0.8937 | 0.1063 |
| 5 6 | 2 | 0.0898 | 0.9102 |
| 6 7 | 1 | 0.8492 | 0.1508 |
| 7 10 | 1 | 0.8498 | 0.1502 |
| 8 11 | 1 | 0.6752 | 0.3248 |
| 9 12 | 1 | 0.9384 | 0.0616 |
| 10 13 | 1 | 0.7358 | 0.2642 |
| 11 14 | 1 | 0.8131 | 0.1869 |
| 12 15 | 1 | 0.8711 | 0.1289 |
| 13 19 | 2 | 0.0915 | 0.9085 |
| 14 20 | 1 | 0.8895 | 0.1105 |
| 15 21 | 2 | 0.1679 | 0.8321 |
| 16 22 | 1 | 0.8669 | 0.1331 |
| 17 26 | 2 | 0.0826 | 0.9174 |
| 18 27 | 2 | 0.4853 | 0.5147 |
| 19 29 | 1 | 0.7361 | 0.2639 |
| 20 31 | 2 | 0.0835 | 0.9165 |
| 21 32 | 2 | 0.0923 | 0.9077 |
| 22 34 | 1 | 0.9316 | 0.0684 |
| 23 35 | 2 | 0.3010 | 0.6990 |
| 24 36 | 2 | 0.4691 | 0.5309 |
| 25 37 | 1 | 0.9123 | 0.0877 |
| 26 38 | 1 | 0.8767 | 0.1233 |
| 27 39 | 1 | 0.7094 | 0.2906 |
| 28 40 | 1 | 0.7942 | 0.2058 |
| 29 41 | 1 | 0.8468 | 0.1532 |
| 30 42 | 1 | 0.8737 | 0.1263 |
| 31 43 | 2 | 0.2259 | 0.7741 |
| 32 46 | 1 | 0.8506 | 0.1494 |
| 33 47 | 1 | 0.8160 | 0.1840 |
| 34 49 | 1 | 0.8898 | 0.1102 |
| 35 52 | 1 | 0.9097 | 0.0903 |

**Fuzzy Clustering Report**

Page/Date/Time 5 4/14/2005 11:44:56 PM
Database
Variables StdFactor1MulSqrtEV1, StdFactor2MulSqrtEV2, StdFactor3MulSqrtEV3
Distance Type Euclidean
Scale Type None

**Membership Matrix Section**

| Row | Cluster | Prob in 1 | Prob in 2 |
|---|---|---|---|
| 36 54 | 1 | 0.8501 | 0.1499 |
| 37 55 | 1 | 0.8822 | 0.1178 |
| 38 56 | 1 | 0.6656 | 0.3344 |
| 39 58 | 1 | 0.8581 | 0.1419 |
| 40 60 | 1 | 0.7954 | 0.2046 |
| 41 61 | 1 | 0.5308 | 0.4692 |
| 42 63 | 2 | 0.4841 | 0.5159 |
| 43 64 | 2 | 0.0620 | 0.9380 |
| 44 65 | 1 | 0.7773 | 0.2227 |
| 45 67 | 2 | 0.2117 | 0.7883 |
| 46 68 | 1 | 0.9082 | 0.0918 |
| 47 71 | 2 | 0.1419 | 0.8581 |
| 48 72 | 1 | 0.7012 | 0.2988 |
| 49 73 | 1 | 0.8462 | 0.1538 |
| 50 74 | 2 | 0.4286 | 0.5714 |
| 51 75 | 1 | 0.9306 | 0.0694 |
| 52 77 | 2 | 0.2984 | 0.7016 |
| 53 80 | 1 | 0.8184 | 0.1816 |
| 54 82 | 2 | 0.1151 | 0.8849 |
| 55 83 | 1 | 0.9214 | 0.0786 |
| 56 84 | 1 | 0.5151 | 0.4849 |
| 57 85 | 2 | 0.0775 | 0.9225 |
| 58 86 | 1 | 0.6515 | 0.3485 |
| 59 87 | 1 | 0.7413 | 0.2587 |
| 60 89 | 2 | 0.2756 | 0.7244 |
| 61 90 | 2 | 0.0947 | 0.9053 |
| 62 91 | 1 | 0.6454 | 0.3546 |
| 63 92 | 2 | 0.3849 | 0.6151 |
| 64 93 | 1 | 0.7826 | 0.2174 |
| 65 95 | 1 | 0.8851 | 0.1149 |
| 66 97 | 1 | 0.6052 | 0.3948 |
| 67 98 | 1 | 0.8924 | 0.1076 |
| 68 99 | 1 | 0.9215 | 0.0785 |
| 69 101 | 2 | 0.1308 | 0.8692 |
| 70 102 | 2 | 0.2402 | 0.7598 |
| 71 103 | 1 | 0.9297 | 0.0703 |
| 72 104 | 2 | 0.1542 | 0.8458 |
| 73 105 | 2 | 0.3034 | 0.6966 |
| 74 107 | 1 | 0.8718 | 0.1282 |
| 75 110 | 2 | 0.1022 | 0.8978 |
| 76 113 | 1 | 0.9314 | 0.0686 |
| 77 114 | 1 | 0.7583 | 0.2417 |
| 78 115 | 1 | 0.8380 | 0.1620 |
| 79 117 | 1 | 0.9229 | 0.0771 |

## Fuzzy Clustering Report

Page/Date/Time 6 4/14/2005 11:44:56 PM
Database
Variables StdFactor1MulSqrtEV1, StdFactor2MulSqrtEV2, StdFactor3MulSqrtEV3
Distance Type Euclidean
Scale Type None

**Membership Matrix Section**

| Row | Cluster | Prob in 1 | Prob in 2 |
|---|---|---|---|
| 80 118 | 2 | 0.0758 | 0.9242 |
| 81 120 | 2 | 0.1917 | 0.8083 |
| 82 121 | 2 | 0.0669 | 0.9331 |
| 83 122 | 2 | 0.1880 | 0.8120 |
| 84 124 | 1 | 0.5774 | 0.4226 |
| 85 125 | 2 | 0.2199 | 0.7801 |
| 86 126 | 1 | 0.8590 | 0.1410 |
| 87 127 | 2 | 0.1557 | 0.8443 |
| 88 128 | 2 | 0.3081 | 0.6919 |
| 89 129 | 1 | 0.7486 | 0.2514 |
| 90 130 | 1 | 0.5858 | 0.4142 |
| 91 131 | 2 | 0.2734 | 0.7266 |
| 92 132 | 1 | 0.8233 | 0.1767 |
| 93 133 | 2 | 0.0815 | 0.9185 |
| 94 134 | 2 | 0.4714 | 0.5286 |
| 95 135 | 1 | 0.9388 | 0.0612 |
| 96 136 | 2 | 0.1455 | 0.8545 |
| 97 138 | 2 | 0.1410 | 0.8590 |
| 98 139 | 1 | 0.8312 | 0.1688 |
| 99 140 | 1 | 0.9346 | 0.0654 |
| 100 141 | 1 | 0.6955 | 0.3045 |
| 101 142 | 2 | 0.4646 | 0.5354 |
| 102 143 | 1 | 0.7610 | 0.2390 |
| 103 144 | 2 | 0.3554 | 0.6446 |
| 104 146 | 1 | 0.6078 | 0.3922 |
| 105 147 | 1 | 0.8592 | 0.1408 |
| 106 148 | 2 | 0.0631 | 0.9369 |
| 107 149 | 1 | 0.9214 | 0.0786 |
| 108 150 | 1 | 0.8178 | 0.1822 |
| 109 151 | 1 | 0.8890 | 0.1110 |
| 110 152 | 2 | 0.1456 | 0.8544 |
| 111 153 | 2 | 0.1073 | 0.8927 |
| 112 154 | 2 | 0.0850 | 0.9150 |
| 113 155 | 2 | 0.1492 | 0.8508 |
| 114 156 | 2 | 0.1814 | 0.8186 |
| 115 158 | 1 | 0.8567 | 0.1433 |
| 116 159 | 2 | 0.1036 | 0.8964 |
| 117 161 | 1 | 0.6390 | 0.3610 |
| 118 163 | 1 | 0.7210 | 0.2790 |
| 119 164 | 1 | 0.9353 | 0.0647 |
| 120 165 | 2 | 0.2713 | 0.7287 |
| 121 168 | 1 | 0.7718 | 0.2282 |
| 122 171 | 1 | 0.8299 | 0.1701 |
| 123 172 | 1 | 0.8242 | 0.1758 |

**Fuzzy Clustering Report**

| | |
|---|---|
| Page/Date/Time | 7 4/14/2005 11:44:56 PM |
| Database | |
| Variables | StdFactor1MulSqrtEV1, StdFactor2MulSqrtEV2, StdFactor3MulSqrtEV3 |
| Distance Type | Euclidean |
| Scale Type | None |

**Cluster Medoids Section**

| Variable | Cluster1 | Cluster2 | Cluster3 | |
|---|---|---|---|---|
| StdFactor1MulSqrtEV1 | | 0.2962535 | 0.7243785 | -1.203201 |
| StdFactor2MulSqrtEV2 | | 0.6357718 | -0.8898659 | 0.2675366 |
| StdFactor3MulSqrtEV3 | | -0.3664877 | 0.1042105 | 0.6876504 |
| Row | 9 12 | 43 64 | 104 146 | |

**Membership Summary Section for Clusters = 3**

<table>
<tr><th>Row</th><th>Cluster</th><th>Cluster Membership</th><th>Sum of Squared Memberships</th><th>Bar of Squared Memberships</th><th>Silhouette Amount</th><th>Silhouette Bar</th></tr>
<tr><td>9 12</td><td>1</td><td>0.9214</td><td>0.8524</td><td>|IIIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.6182</td><td>|IIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>107 149</td><td>1</td><td>0.9195</td><td>0.8488</td><td>|IIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.6098</td><td>|IIIIIIIIIIIIIIIIII</td></tr>
<tr><td>22 34</td><td>1</td><td>0.9167</td><td>0.8441</td><td>|IIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.6191</td><td>|IIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>99 140</td><td>1</td><td>0.9130</td><td>0.8378</td><td>|IIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.6181</td><td>|IIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>76 113</td><td>1</td><td>0.9118</td><td>0.8356</td><td>|IIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.6098</td><td>|IIIIIIIIIIIIIIIIII</td></tr>
<tr><td>95 135</td><td>1</td><td>0.9105</td><td>0.8335</td><td>|IIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.6098</td><td>|IIIIIIIIIIIIIIIIII</td></tr>
<tr><td>109 151</td><td>1</td><td>0.9028</td><td>0.8198</td><td>|IIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.5924</td><td>|IIIIIIIIIIIIIIIIII</td></tr>
<tr><td>4 4</td><td>1</td><td>0.8982</td><td>0.8120</td><td>|IIIIIIIIIIIIIIIIIIIIIIII</td><td>0.5976</td><td>|IIIIIIIIIIIIIIIIII</td></tr>
<tr><td>37 55</td><td>1</td><td>0.8982</td><td>0.8119</td><td>|IIIIIIIIIIIIIIIIIIIIIIII</td><td>0.5773</td><td>|IIIIIIIIIIIIIIIII</td></tr>
<tr><td>65 95</td><td>1</td><td>0.8898</td><td>0.7979</td><td>|IIIIIIIIIIIIIIIIIIIIIIII</td><td>0.6021</td><td>|IIIIIIIIIIIIIIIIII</td></tr>
<tr><td>79 117</td><td>1</td><td>0.8852</td><td>0.7908</td><td>|IIIIIIIIIIIIIIIIIIIIIIII</td><td>0.6030</td><td>|IIIIIIIIIIIIIIIIII</td></tr>
<tr><td>71 103</td><td>1</td><td>0.8771</td><td>0.7780</td><td>|IIIIIIIIIIIIIIIIIIIIIII</td><td>0.5897</td><td>|IIIIIIIIIIIIIIIIII</td></tr>
<tr><td>67 98</td><td>1</td><td>0.8761</td><td>0.7757</td><td>|IIIIIIIIIIIIIIIIIIIIIII</td><td>0.5812</td><td>|IIIIIIIIIIIIIIIII</td></tr>
<tr><td>55 83</td><td>1</td><td>0.8563</td><td>0.7453</td><td>|IIIIIIIIIIIIIIIIIIIIII</td><td>0.5845</td><td>|IIIIIIIIIIIIIIIIII</td></tr>
<tr><td>86 126</td><td>1</td><td>0.8562</td><td>0.7436</td><td>|IIIIIIIIIIIIIIIIIIIIII</td><td>0.5645</td><td>|IIIIIIIIIIIIIIIII</td></tr>
<tr><td>30 42</td><td>1</td><td>0.8549</td><td>0.7416</td><td>|IIIIIIIIIIIIIIIIIIIIII</td><td>0.5803</td><td>|IIIIIIIIIIIIIIIII</td></tr>
<tr><td>105 147</td><td>1</td><td>0.8503</td><td>0.7342</td><td>|IIIIIIIIIIIIIIIIIIIIII</td><td>0.5132</td><td>|IIIIIIIIIIIIIII</td></tr>
<tr><td>49 73</td><td>1</td><td>0.8489</td><td>0.7321</td><td>|IIIIIIIIIIIIIIIIIIIIII</td><td>0.5596</td><td>|IIIIIIIIIIIIIIIII</td></tr>
<tr><td>39 58</td><td>1</td><td>0.8484</td><td>0.7315</td><td>|IIIIIIIIIIIIIIIIIIIIII</td><td>0.5700</td><td>|IIIIIIIIIIIIIIIII</td></tr>
<tr><td>36 54</td><td>1</td><td>0.8395</td><td>0.7179</td><td>|IIIIIIIIIIIIIIIIIIIIII</td><td>0.5643</td><td>|IIIIIIIIIIIIIIIII</td></tr>
<tr><td>119 164</td><td>1</td><td>0.8313</td><td>0.7089</td><td>|IIIIIIIIIIIIIIIIIIIII</td><td>0.6141</td><td>|IIIIIIIIIIIIIIIIII</td></tr>
<tr><td>98 139</td><td>1</td><td>0.8228</td><td>0.6927</td><td>|IIIIIIIIIIIIIIIIIIIII</td><td>0.5435</td><td>|IIIIIIIIIIIIIIII</td></tr>
<tr><td>32 46</td><td>1</td><td>0.8150</td><td>0.6821</td><td>|IIIIIIIIIIIIIIIIIIII</td><td>0.5542</td><td>|IIIIIIIIIIIIIIIII</td></tr>
<tr><td>7 10</td><td>1</td><td>0.8126</td><td>0.6781</td><td>|IIIIIIIIIIIIIIIIIIII</td><td>0.5462</td><td>|IIIIIIIIIIIIIIII</td></tr>
<tr><td>108 150</td><td>1</td><td>0.8098</td><td>0.6739</td><td>|IIIIIIIIIIIIIIIIIIII</td><td>0.5353</td><td>|IIIIIIIIIIIIIIII</td></tr>
<tr><td>92 132</td><td>1</td><td>0.7876</td><td>0.6430</td><td>|IIIIIIIIIIIIIIIIIII</td><td>0.5352</td><td>|IIIIIIIIIIIIIIII</td></tr>
<tr><td>74 107</td><td>1</td><td>0.7675</td><td>0.6181</td><td>|IIIIIIIIIIIIIIIIIII</td><td>0.5286</td><td>|IIIIIIIIIIIIIIII</td></tr>
<tr><td>68 99</td><td>1</td><td>0.7643</td><td>0.6201</td><td>|IIIIIIIIIIIIIIIIIII</td><td>0.5981</td><td>|IIIIIIIIIIIIIIIIII</td></tr>
<tr><td>28 40</td><td>1</td><td>0.7471</td><td>0.5902</td><td>|IIIIIIIIIIIIIIIIII</td><td>0.5096</td><td>|IIIIIIIIIIIIIII</td></tr>
<tr><td>26 38</td><td>1</td><td>0.7195</td><td>0.5657</td><td>|IIIIIIIIIIIIIIIII</td><td>0.5302</td><td>|IIIIIIIIIIIIIIII</td></tr>
<tr><td>77 114</td><td>1</td><td>0.7060</td><td>0.5418</td><td>|IIIIIIIIIIIIIIII</td><td>0.4577</td><td>|IIIIIIIIIIIIII</td></tr>
<tr><td>122 171</td><td>1</td><td>0.7044</td><td>0.5444</td><td>|IIIIIIIIIIIIIIII</td><td>0.4819</td><td>|IIIIIIIIIIIIII</td></tr>
<tr><td>51 75</td><td>1</td><td>0.7041</td><td>0.5587</td><td>|IIIIIIIIIIIIIIIII</td><td>0.5830</td><td>|IIIIIIIIIIIIIIIII</td></tr>
<tr><td>78 115</td><td>1</td><td>0.6735</td><td>0.5114</td><td>|IIIIIIIIIIIIIII</td><td>0.4690</td><td>|IIIIIIIIIIIIII</td></tr>
<tr><td>64 93</td><td>1</td><td>0.6718</td><td>0.5061</td><td>|IIIIIIIIIIIIIII</td><td>0.4823</td><td>|IIIIIIIIIIIIII</td></tr>
</table>

## Fuzzy Clustering Report

Page/Date/Time 8 4/14/2005 11:44:56 PM
Database
Variables StdFactor1MulSqrtEV1, StdFactor2MulSqrtEV2, StdFactor3MulSqrtEV3
Distance Type Euclidean
Scale Type None

**Membership Summary Section for Clusters = 3**

| Row | Cluster | Cluster Membership | Sum of Squared Memberships | Bar of Squared Memberships | Silhouette Amount | Silhouette Bar |
|---|---|---|---|---|---|---|
| 14 20 | 1 | 0.6677 | 0.5203 | IIIIIIIIIIIIIIIII | 0.5514 | IIIIIIIIIIIIIIIIII |
| 6 7 | 1 | 0.6586 | 0.5007 | IIIIIIIIIIIIIIII | 0.5069 | IIIIIIIIIIIIIIII |
| 35 52 | 1 | 0.6573 | 0.5151 | IIIIIIIIIIIIIIII | 0.5465 | IIIIIIIIIIIIIIIII |
| 33 47 | 1 | 0.6420 | 0.4830 | IIIIIIIIIIIIIII | 0.5086 | IIIIIIIIIIIIIIII |
| 46 68 | 1 | 0.6383 | 0.4986 | IIIIIIIIIIIIIIII | 0.5460 | IIIIIIIIIIIIIIIII |
| 59 87 | 1 | 0.6211 | 0.4581 | IIIIIIIIIIIIIII | 0.4425 | IIIIIIIIIIIIII |
| 25 37 | 1 | 0.5995 | 0.4795 | IIIIIIIIIIIIIII | 0.5503 | IIIIIIIIIIIIIIIIII |
| 10 13 | 1 | 0.5903 | 0.4338 | IIIIIIIIIIIIII | 0.4270 | IIIIIIIIIIIIII |
| 89 129 | 1 | 0.5886 | 0.4387 | IIIIIIIIIIIIII | 0.4239 | IIIIIIIIIIIIII |
| 3 3 | 1 | 0.5512 | 0.4249 | IIIIIIIIIIIIII | 0.4210 | IIIIIIIIIIIIII |
| 16 22 | 1 | 0.5499 | 0.4460 | IIIIIIIIIIIIII | 0.4972 | IIIIIIIIIIIIIIII |
| 1 1 | 1 | 0.5401 | 0.4399 | IIIIIIIIIIIIII | 0.5221 | IIIIIIIIIIIIIIIII |
| 48 72 | 1 | 0.5091 | 0.3841 | IIIIIIIIIIIII | 0.3798 | IIIIIIIIIIII |
| 11 14 | 1 | 0.5085 | 0.4105 | IIIIIIIIIIIII | 0.4507 | IIIIIIIIIIIIIII |
| 38 56 | 1 | 0.4973 | 0.3748 | IIIIIIIIIIII | 0.3396 | IIIIIIIIIII |
| 115 158 | 1 | 0.4842 | 0.4239 | IIIIIIIIIIIIII | 0.4866 | IIIIIIIIIIIIIIII |
| 40 60 | 1 | 0.4598 | 0.4104 | IIIIIIIIIIIII | 0.4262 | IIIIIIIIIIIIII |
| 121 168 | 1 | 0.4520 | 0.4039 | IIIIIIIIIIIII | 0.4130 | IIIIIIIIIIIII |
| 84 124 | 1 | 0.4471 | 0.3532 | IIIIIIIIIIII | 0.2057 | IIIIIII |
| 102 143 | 1 | 0.4414 | 0.3902 | IIIIIIIIIIIII | 0.4192 | IIIIIIIIIIIIII |
| 58 86 | 1 | 0.4229 | 0.3636 | IIIIIIIIIIII | 0.2715 | IIIIIIIII |
| 66 97 | 1 | 0.4118 | 0.3510 | IIIIIIIIIIII | 0.2215 | IIIIIIII |
| 43 64 | 2 | 0.9474 | 0.8990 | IIIIIIIIIIIIIIIIIIIIIIIIIIII | 0.5540 | IIIIIIIIIIIIIIIIII |
| 20 31 | 2 | 0.9431 | 0.8911 | IIIIIIIIIIIIIIIIIIIIIIIIIIII | 0.5018 | IIIIIIIIIIIIIIII |
| 5 6 | 2 | 0.9411 | 0.8874 | IIIIIIIIIIIIIIIIIIIIIIIIIIII | 0.5077 | IIIIIIIIIIIIIIII |
| 17 26 | 2 | 0.9403 | 0.8860 | IIIIIIIIIIIIIIIIIIIIIIIIIIII | 0.4934 | IIIIIIIIIIIIIIII |
| 106 148 | 2 | 0.9397 | 0.8849 | IIIIIIIIIIIIIIIIIIIIIIIIIIII | 0.5581 | IIIIIIIIIIIIIIIIII |
| 93 133 | 2 | 0.9392 | 0.8839 | IIIIIIIIIIIIIIIIIIIIIIIIIIII | 0.5442 | IIIIIIIIIIIIIIIII |
| 61 90 | 2 | 0.9365 | 0.8791 | IIIIIIIIIIIIIIIIIIIIIIIIIII | 0.5080 | IIIIIIIIIIIIIIII |
| 82 121 | 2 | 0.9319 | 0.8708 | IIIIIIIIIIIIIIIIIIIIIIIIIII | 0.5409 | IIIIIIIIIIIIIIIII |
| 111 153 | 2 | 0.9200 | 0.8496 | IIIIIIIIIIIIIIIIIIIIIIIIII | 0.5019 | IIIIIIIIIIIIIIII |
| 80 118 | 2 | 0.9122 | 0.8360 | IIIIIIIIIIIIIIIIIIIIIIIIII | 0.5299 | IIIIIIIIIIIIIIIII |
| 116 159 | 2 | 0.9074 | 0.8277 | IIIIIIIIIIIIIIIIIIIIIIIIII | 0.5070 | IIIIIIIIIIIIIIII |
| 13 19 | 2 | 0.9033 | 0.8206 | IIIIIIIIIIIIIIIIIIIIIIIIII | 0.4755 | IIIIIIIIIIIIIII |
| 57 85 | 2 | 0.8922 | 0.8020 | IIIIIIIIIIIIIIIIIIIIIIIII | 0.5300 | IIIIIIIIIIIIIIIII |
| 54 82 | 2 | 0.8864 | 0.7923 | IIIIIIIIIIIIIIIIIIIIIIIII | 0.4887 | IIIIIIIIIIIIIIII |
| 110 152 | 2 | 0.8787 | 0.7798 | IIIIIIIIIIIIIIIIIIIIIIII | 0.4412 | IIIIIIIIIIIIII |
| 72 104 | 2 | 0.8665 | 0.7600 | IIIIIIIIIIIIIIIIIIIIIIII | 0.4343 | IIIIIIIIIIIIII |
| 21 32 | 2 | 0.8514 | 0.7361 | IIIIIIIIIIIIIIIIIIIIIII | 0.4627 | IIIIIIIIIIIIIII |
| 15 21 | 2 | 0.8496 | 0.7336 | IIIIIIIIIIIIIIIIIIIIIII | 0.4168 | IIIIIIIIIIIIII |
| 112 154 | 2 | 0.8484 | 0.7318 | IIIIIIIIIIIIIIIIIIIIIII | 0.5192 | IIIIIIIIIIIIIIIII |
| 97 138 | 2 | 0.8417 | 0.7209 | IIIIIIIIIIIIIIIIIIIIIII | 0.3988 | IIIIIIIIIIIII |

### Fuzzy Clustering Report

Page/Date/Time 9 4/14/2005 11:44:56 PM
Database
Variables StdFactor1MulSqrtEV1, StdFactor2MulSqrtEV2, StdFactor3MulSqrtEV3
Distance Type Euclidean
Scale Type None

**Membership Summary Section for Clusters = 3**

<table>
<tr><th>Row</th><th>Cluster</th><th>Cluster Membership</th><th>Sum of Squared Memberships</th><th>Bar of Squared Memberships</th><th>Silhouette Amount</th><th>Silhouette Bar</th></tr>
<tr><td>113 155</td><td>2</td><td>0.8348</td><td>0.7105</td><td>||||||||||||||||||||||</td><td>0.4193</td><td>||||||||||||||</td></tr>
<tr><td>87 127</td><td>2</td><td>0.8209</td><td>0.6903</td><td>||||||||||||||||||||||</td><td>0.4275</td><td>||||||||||||||</td></tr>
<tr><td>83 122</td><td>2</td><td>0.8180</td><td>0.6862</td><td>||||||||||||||||||||||</td><td>0.3897</td><td>|||||||||||||</td></tr>
<tr><td>75 110</td><td>2</td><td>0.8002</td><td>0.6614</td><td>|||||||||||||||||||||</td><td>0.4450</td><td>||||||||||||||</td></tr>
<tr><td>96 136</td><td>2</td><td>0.7972</td><td>0.6563</td><td>|||||||||||||||||||||</td><td>0.4678</td><td>|||||||||||||||</td></tr>
<tr><td>47 71</td><td>2</td><td>0.7934</td><td>0.6511</td><td>|||||||||||||||||||||</td><td>0.4152</td><td>|||||||||||||</td></tr>
<tr><td>45 67</td><td>2</td><td>0.7800</td><td>0.6334</td><td>||||||||||||||||||||</td><td>0.3648</td><td>||||||||||||</td></tr>
<tr><td>85 125</td><td>2</td><td>0.7660</td><td>0.6149</td><td>|||||||||||||||||||</td><td>0.3485</td><td>|||||||||||</td></tr>
<tr><td>69 101</td><td>2</td><td>0.7342</td><td>0.5774</td><td>||||||||||||||||||</td><td>0.4562</td><td>|||||||||||||||</td></tr>
<tr><td>114 156</td><td>2</td><td>0.6629</td><td>0.4969</td><td>||||||||||||||||</td><td>0.3839</td><td>|||||||||||||</td></tr>
<tr><td>23 35</td><td>2</td><td>0.6245</td><td>0.4615</td><td>|||||||||||||||</td><td>0.2436</td><td>||||||||</td></tr>
<tr><td>70 102</td><td>2</td><td>0.5905</td><td>0.4327</td><td>||||||||||||||</td><td>0.3247</td><td>|||||||||||</td></tr>
<tr><td>81 120</td><td>2</td><td>0.5193</td><td>0.4038</td><td>|||||||||||||</td><td>0.3620</td><td>||||||||||||</td></tr>
<tr><td>60 89</td><td>2</td><td>0.5037</td><td>0.3788</td><td>||||||||||||</td><td>0.2760</td><td>|||||||||</td></tr>
<tr><td>31 43</td><td>2</td><td>0.4958</td><td>0.3868</td><td>|||||||||||||</td><td>0.3400</td><td>|||||||||||</td></tr>
<tr><td>91 131</td><td>2</td><td>0.4431</td><td>0.3780</td><td>||||||||||||</td><td>0.2273</td><td>||||||||</td></tr>
<tr><td>103 144</td><td>2</td><td>0.4023</td><td>0.3445</td><td>|||||||||||</td><td>0.1891</td><td>|||||||</td></tr>
<tr><td>50 74</td><td>2</td><td>0.3594</td><td>0.3356</td><td>|||||||||||</td><td>0.0963</td><td>||||</td></tr>
<tr><td>104 146</td><td>3</td><td>0.7939</td><td>0.6525</td><td>|||||||||||||||||||||</td><td>0.0059</td><td>|</td></tr>
<tr><td>19 29</td><td>3</td><td>0.7663</td><td>0.6194</td><td>||||||||||||||||||||</td><td>-0.2675</td><td>|</td></tr>
<tr><td>62 91</td><td>3</td><td>0.7461</td><td>0.5913</td><td>|||||||||||||||||||</td><td>-0.0153</td><td>|</td></tr>
<tr><td>24 36</td><td>3</td><td>0.7356</td><td>0.5760</td><td>||||||||||||||||||</td><td>0.1794</td><td>||||||</td></tr>
<tr><td>100 141</td><td>3</td><td>0.7279</td><td>0.5717</td><td>||||||||||||||||||</td><td>-0.1361</td><td>|</td></tr>
<tr><td>8 11</td><td>3</td><td>0.7249</td><td>0.5672</td><td>||||||||||||||||||</td><td>-0.1189</td><td>|</td></tr>
<tr><td>90 130</td><td>3</td><td>0.7099</td><td>0.5473</td><td>|||||||||||||||||</td><td>0.1034</td><td>||||</td></tr>
<tr><td>27 39</td><td>3</td><td>0.6874</td><td>0.5296</td><td>|||||||||||||||||</td><td>-0.3416</td><td>|</td></tr>
<tr><td>101 142</td><td>3</td><td>0.6708</td><td>0.5042</td><td>||||||||||||||||</td><td>0.2644</td><td>|||||||||</td></tr>
<tr><td>53 80</td><td>3</td><td>0.6555</td><td>0.5101</td><td>||||||||||||||||</td><td>-0.4246</td><td>|</td></tr>
<tr><td>56 84</td><td>3</td><td>0.6326</td><td>0.4683</td><td>|||||||||||||||</td><td>-0.1429</td><td>|</td></tr>
<tr><td>42 63</td><td>3</td><td>0.6295</td><td>0.4649</td><td>|||||||||||||||</td><td>0.2660</td><td>|||||||||</td></tr>
<tr><td>41 61</td><td>3</td><td>0.6014</td><td>0.4417</td><td>||||||||||||||</td><td>0.2030</td><td>|||||||</td></tr>
<tr><td>118 163</td><td>3</td><td>0.5788</td><td>0.4427</td><td>||||||||||||||</td><td>-0.4124</td><td>|</td></tr>
<tr><td>123 172</td><td>3</td><td>0.5786</td><td>0.4547</td><td>|||||||||||||||</td><td>-0.4794</td><td>|</td></tr>
<tr><td>117 161</td><td>3</td><td>0.5622</td><td>0.4186</td><td>||||||||||||||</td><td>-0.2187</td><td>|</td></tr>
<tr><td>44 65</td><td>3</td><td>0.5604</td><td>0.4392</td><td>||||||||||||||</td><td>-0.4763</td><td>|</td></tr>
<tr><td>52 77</td><td>3</td><td>0.5399</td><td>0.4092</td><td>|||||||||||||</td><td>-0.0986</td><td>|</td></tr>
<tr><td>63 92</td><td>3</td><td>0.5346</td><td>0.3975</td><td>|||||||||||||</td><td>0.1362</td><td>|||||</td></tr>
<tr><td>94 134</td><td>3</td><td>0.5220</td><td>0.3867</td><td>|||||||||||||</td><td>0.2430</td><td>||||||||</td></tr>
<tr><td>12 15</td><td>3</td><td>0.4906</td><td>0.4349</td><td>||||||||||||||</td><td>-0.5402</td><td>|</td></tr>
<tr><td>2 2</td><td>3</td><td>0.4868</td><td>0.4356</td><td>||||||||||||||</td><td>-0.5248</td><td>|</td></tr>
<tr><td>34 49</td><td>3</td><td>0.4721</td><td>0.4388</td><td>||||||||||||||</td><td>-0.5476</td><td>|</td></tr>
<tr><td>29 41</td><td>3</td><td>0.4608</td><td>0.4193</td><td>||||||||||||||</td><td>-0.5388</td><td>|</td></tr>
</table>

**Fuzzy Clustering Report**

| | |
|---|---|
| Page/Date/Time | 10 4/14/2005 11:44:56 PM |
| Database | |
| Variables | StdFactor1MulSqrtEV1, StdFactor2MulSqrtEV2, StdFactor3MulSqrtEV3 |
| Distance Type | Euclidean |
| Scale Type | None |

**Membership Summary Section for Clusters = 3**

| Row | Cluster | Cluster Membership | Sum of Squared Memberships | Bar of Squared Memberships | Silhouette Amount | Silhouette Bar |
|---|---|---|---|---|---|---|
| 88 128 | 3 | 0.4563 | 0.3709 | \|IIIIIIIIIII | -0.1352 | \| |
| 120 165 | 3 | 0.4367 | 0.3737 | \|IIIIIIIIIII | -0.2175 | \| |
| 73 105 | 3 | 0.4196 | 0.3618 | \|IIIIIIIIIII | -0.2494 | \| |
| 18 27 | 3 | 0.3927 | 0.3387 | \|IIIIIIIIII | 0.1146 | \|III |

**Membership Matrix Section**

| Row | Cluster | Prob in 1 | Prob in 2 | Prob in 3 |
|---|---|---|---|---|
| 1 1 | 1 | 0.5401 | 0.0844 | 0.3755 |
| 2 2 | 3 | 0.4395 | 0.0737 | 0.4868 |
| 3 3 | 1 | 0.5512 | 0.1235 | 0.3253 |
| 4 4 | 1 | 0.8982 | 0.0440 | 0.0579 |
| 5 6 | 2 | 0.0329 | 0.9411 | 0.0260 |
| 6 7 | 1 | 0.6586 | 0.1048 | 0.2367 |
| 7 10 | 1 | 0.8126 | 0.0838 | 0.1036 |
| 8 11 | 3 | 0.1818 | 0.0933 | 0.7249 |
| 9 12 | 1 | 0.9214 | 0.0259 | 0.0527 |
| 10 13 | 1 | 0.5903 | 0.1789 | 0.2308 |
| 11 14 | 1 | 0.5085 | 0.1210 | 0.3705 |
| 12 15 | 3 | 0.4342 | 0.0751 | 0.4906 |
| 13 19 | 2 | 0.0505 | 0.9033 | 0.0463 |
| 14 20 | 1 | 0.6677 | 0.0680 | 0.2643 |
| 15 21 | 2 | 0.0907 | 0.8496 | 0.0597 |
| 16 22 | 1 | 0.5499 | 0.0796 | 0.3705 |
| 17 26 | 2 | 0.0322 | 0.9403 | 0.0274 |
| 18 27 | 3 | 0.2988 | 0.3086 | 0.3927 |
| 19 29 | 3 | 0.1660 | 0.0676 | 0.7663 |
| 20 31 | 2 | 0.0314 | 0.9431 | 0.0255 |
| 21 32 | 2 | 0.0653 | 0.8514 | 0.0833 |
| 22 34 | 1 | 0.9167 | 0.0279 | 0.0554 |
| 23 35 | 2 | 0.2096 | 0.6245 | 0.1659 |
| 24 36 | 3 | 0.1297 | 0.1347 | 0.7356 |
| 25 37 | 1 | 0.5995 | 0.0590 | 0.3415 |
| 26 38 | 1 | 0.7195 | 0.0744 | 0.2061 |
| 27 39 | 3 | 0.2203 | 0.0923 | 0.6874 |
| 28 40 | 1 | 0.7471 | 0.1214 | 0.1315 |
| 29 41 | 3 | 0.4452 | 0.0941 | 0.4608 |
| 30 42 | 1 | 0.8549 | 0.0626 | 0.0825 |
| 31 43 | 2 | 0.1688 | 0.4958 | 0.3355 |
| 32 46 | 1 | 0.8150 | 0.0736 | 0.1114 |
| 33 47 | 1 | 0.6420 | 0.1209 | 0.2370 |
| 34 49 | 3 | 0.4596 | 0.0683 | 0.4721 |
| 35 52 | 1 | 0.6573 | 0.0610 | 0.2817 |

## Fuzzy Clustering Report

Page/Date/Time 11 4/14/2005 11:44:56 PM
Database
Variables StdFactor1MulSqrtEV1, StdFactor2MulSqrtEV2, StdFactor3MulSqrtEV3
Distance Type Euclidean
Scale Type None

**Membership Matrix Section**

| Row | Cluster | Prob in 1 | Prob in 2 | Prob in 3 |
|---|---|---|---|---|
| 36 54 | 1 | 0.8395 | 0.0696 | 0.0909 |
| 37 55 | 1 | 0.8982 | 0.0470 | 0.0548 |
| 38 56 | 1 | 0.4973 | 0.2276 | 0.2751 |
| 39 58 | 1 | 0.8484 | 0.0645 | 0.0871 |
| 40 60 | 1 | 0.4598 | 0.1072 | 0.4330 |
| 41 61 | 3 | 0.2166 | 0.1820 | 0.6014 |
| 42 63 | 3 | 0.1881 | 0.1825 | 0.6295 |
| 43 64 | 2 | 0.0255 | 0.9474 | 0.0271 |
| 44 65 | 3 | 0.3391 | 0.1005 | 0.5604 |
| 45 67 | 2 | 0.1300 | 0.7800 | 0.0900 |
| 46 68 | 1 | 0.6383 | 0.0675 | 0.2942 |
| 47 71 | 2 | 0.0904 | 0.7934 | 0.1162 |
| 48 72 | 1 | 0.5091 | 0.1985 | 0.2924 |
| 49 73 | 1 | 0.8489 | 0.0699 | 0.0811 |
| 50 74 | 2 | 0.2956 | 0.3594 | 0.3451 |
| 51 75 | 1 | 0.7041 | 0.0501 | 0.2458 |
| 52 77 | 3 | 0.1531 | 0.3070 | 0.5399 |
| 53 80 | 3 | 0.2750 | 0.0695 | 0.6555 |
| 54 82 | 2 | 0.0630 | 0.8864 | 0.0506 |
| 55 83 | 1 | 0.8563 | 0.0424 | 0.1013 |
| 56 84 | 3 | 0.2019 | 0.1655 | 0.6326 |
| 57 85 | 2 | 0.0453 | 0.8922 | 0.0624 |
| 58 86 | 1 | 0.4229 | 0.1930 | 0.3841 |
| 59 87 | 1 | 0.6211 | 0.1730 | 0.2059 |
| 60 89 | 2 | 0.2174 | 0.5037 | 0.2789 |
| 61 90 | 2 | 0.0357 | 0.9365 | 0.0278 |
| 62 91 | 3 | 0.1617 | 0.0922 | 0.7461 |
| 63 92 | 3 | 0.1913 | 0.2741 | 0.5346 |
| 64 93 | 1 | 0.6718 | 0.1430 | 0.1852 |
| 65 95 | 1 | 0.8898 | 0.0470 | 0.0632 |
| 66 97 | 1 | 0.4118 | 0.2290 | 0.3592 |
| 67 98 | 1 | 0.8761 | 0.0476 | 0.0762 |
| 68 99 | 1 | 0.7643 | 0.0539 | 0.1818 |
| 69 101 | 2 | 0.0947 | 0.7342 | 0.1711 |
| 70 102 | 2 | 0.1970 | 0.5905 | 0.2125 |
| 71 103 | 1 | 0.8771 | 0.0371 | 0.0858 |
| 72 104 | 2 | 0.0805 | 0.8665 | 0.0531 |
| 73 105 | 3 | 0.1973 | 0.3831 | 0.4196 |
| 74 107 | 1 | 0.7675 | 0.0851 | 0.1473 |
| 75 110 | 2 | 0.0762 | 0.8002 | 0.1236 |
| 76 113 | 1 | 0.9118 | 0.0311 | 0.0571 |
| 77 114 | 1 | 0.7060 | 0.1374 | 0.1567 |
| 78 115 | 1 | 0.6735 | 0.1160 | 0.2105 |
| 79 117 | 1 | 0.8852 | 0.0398 | 0.0750 |

**Fuzzy Clustering Report**

| | |
|---|---|
| Page/Date/Time | 12 4/14/2005 11:44:56 PM |
| Database | |
| Variables | StdFactor1MulSqrtEV1, StdFactor2MulSqrtEV2, StdFactor3MulSqrtEV3 |
| Distance Type | Euclidean |
| Scale Type | None |

**Membership Matrix Section**

| Row | Cluster | Prob in 1 | Prob in 2 | Prob in 3 |
|---|---|---|---|---|
| 80 118 | 2 | 0.0420 | 0.9122 | 0.0458 |
| 81 120 | 2 | 0.1440 | 0.5193 | 0.3367 |
| 82 121 | 2 | 0.0312 | 0.9319 | 0.0369 |
| 83 122 | 2 | 0.1080 | 0.8180 | 0.0740 |
| 84 124 | 1 | 0.4471 | 0.2611 | 0.2918 |
| 85 125 | 2 | 0.1374 | 0.7660 | 0.0966 |
| 86 126 | 1 | 0.8562 | 0.0630 | 0.0808 |
| 87 127 | 2 | 0.1026 | 0.8209 | 0.0765 |
| 88 128 | 3 | 0.1857 | 0.3580 | 0.4563 |
| 89 129 | 1 | 0.5886 | 0.1438 | 0.2677 |
| 90 130 | 3 | 0.1703 | 0.1198 | 0.7099 |
| 91 131 | 2 | 0.1632 | 0.4431 | 0.3937 |
| 92 132 | 1 | 0.7876 | 0.0996 | 0.1128 |
| 93 133 | 2 | 0.0324 | 0.9392 | 0.0284 |
| 94 134 | 3 | 0.2350 | 0.2430 | 0.5220 |
| 95 135 | 1 | 0.9105 | 0.0285 | 0.0611 |
| 96 136 | 2 | 0.0909 | 0.7972 | 0.1119 |
| 97 138 | 2 | 0.0808 | 0.8417 | 0.0775 |
| 98 139 | 1 | 0.8228 | 0.0864 | 0.0908 |
| 99 140 | 1 | 0.9130 | 0.0281 | 0.0590 |
| 100 141 | 3 | 0.1853 | 0.0869 | 0.7279 |
| 101 142 | 3 | 0.1606 | 0.1686 | 0.6708 |
| 102 143 | 1 | 0.4414 | 0.1391 | 0.4195 |
| 103 144 | 2 | 0.2537 | 0.4023 | 0.3440 |
| 104 146 | 3 | 0.1241 | 0.0820 | 0.7939 |
| 105 147 | 1 | 0.8503 | 0.0700 | 0.0797 |
| 106 148 | 2 | 0.0285 | 0.9397 | 0.0318 |
| 107 149 | 1 | 0.9195 | 0.0301 | 0.0504 |
| 108 150 | 1 | 0.8098 | 0.0923 | 0.0979 |
| 109 151 | 1 | 0.9028 | 0.0436 | 0.0536 |
| 110 152 | 2 | 0.0715 | 0.8787 | 0.0497 |
| 111 153 | 2 | 0.0445 | 0.9200 | 0.0355 |
| 112 154 | 2 | 0.0600 | 0.8484 | 0.0916 |
| 113 155 | 2 | 0.0847 | 0.8348 | 0.0805 |
| 114 156 | 2 | 0.1506 | 0.6629 | 0.1865 |
| 115 158 | 1 | 0.4842 | 0.0899 | 0.4259 |
| 116 159 | 2 | 0.0512 | 0.9074 | 0.0414 |
| 117 161 | 3 | 0.2765 | 0.1613 | 0.5622 |
| 118 163 | 3 | 0.3079 | 0.1132 | 0.5788 |
| 119 164 | 1 | 0.8313 | 0.0418 | 0.1269 |
| 120 165 | 3 | 0.1713 | 0.3920 | 0.4367 |
| 121 168 | 1 | 0.4520 | 0.1168 | 0.4312 |
| 122 171 | 1 | 0.7044 | 0.1000 | 0.1956 |
| 123 172 | 3 | 0.3355 | 0.0859 | 0.5786 |

## Fuzzy Clustering Report

Page/Date/Time 13 4/14/2005 11:44:57 PM
Database
Variables StdFactor1MulSqrtEV1, StdFactor2MulSqrtEV2, StdFactor3MulSqrtEV3
Distance Type Euclidean
Scale Type None

**Cluster Medoids Section**

| **Variable** | **Cluster1** | **Cluster2** | **Cluster3** | **Cluster4** | |
|---|---|---|---|---|---|
| StdFactor1MulSqrtEV1 | | 0.6807795 | -0.284909 | 0.9920075 | -2.392174 |
| StdFactor2MulSqrtEV2 | | 0.7534136 | 0.4169257 | -0.6348409 | -0.5648198 |
| StdFactor3MulSqrtEV3 | | -0.3878728 | -7.280035E-02 | 0.137514 | 1.007912 |
| Row | 109 151 | 12 15 | 5 6 | 101 142 | |

**Membership Summary Section for Clusters = 4**

<table>
<tr><th>Row</th><th>Cluster</th><th>Cluster Membership</th><th>Sum of Squared Memberships</th><th>Bar of Squared Memberships</th><th>Silhouette Amount</th><th>Silhouette Bar</th></tr>
<tr><td>109 151</td><td>1</td><td>0.8806</td><td>0.7837</td><td>|IIIIIIIIIIIIIIIIIIIIIIII</td><td>0.4949</td><td>|IIIIIIIIIIIIIII</td></tr>
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<tr><td>65 95</td><td>1</td><td>0.8611</td><td>0.7527</td><td>|IIIIIIIIIIIIIIIIIIIIIII</td><td>0.4904</td><td>|IIIIIIIIIIIIIII</td></tr>
<tr><td>30 42</td><td>1</td><td>0.8177</td><td>0.6871</td><td>|IIIIIIIIIIIIIIIIIIIII</td><td>0.4901</td><td>|IIIIIIIIIIIIIII</td></tr>
<tr><td>49 73</td><td>1</td><td>0.8110</td><td>0.6765</td><td>|IIIIIIIIIIIIIIIIIIII</td><td>0.4625</td><td>|IIIIIIIIIIIIII</td></tr>
<tr><td>107 149</td><td>1</td><td>0.8090</td><td>0.6801</td><td>|IIIIIIIIIIIIIIIIIIII</td><td>0.3522</td><td>|IIIIIIIIIII</td></tr>
<tr><td>98 139</td><td>1</td><td>0.8055</td><td>0.6676</td><td>|IIIIIIIIIIIIIIIIIIII</td><td>0.5062</td><td>|IIIIIIIIIIIIIII</td></tr>
<tr><td>76 113</td><td>1</td><td>0.7863</td><td>0.6513</td><td>|IIIIIIIIIIIIIIIIIIII</td><td>0.3537</td><td>|IIIIIIIIIII</td></tr>
<tr><td>86 126</td><td>1</td><td>0.7850</td><td>0.6424</td><td>|IIIIIIIIIIIIIIIIIII</td><td>0.4031</td><td>|IIIIIIIIIIII</td></tr>
<tr><td>108 150</td><td>1</td><td>0.7803</td><td>0.6324</td><td>|IIIIIIIIIIIIIIIIIII</td><td>0.4779</td><td>|IIIIIIIIIIIIII</td></tr>
<tr><td>39 58</td><td>1</td><td>0.7777</td><td>0.6327</td><td>|IIIIIIIIIIIIIIIIIII</td><td>0.4053</td><td>|IIIIIIIIIIII</td></tr>
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<tr><td>7 10</td><td>1</td><td>0.7603</td><td>0.6087</td><td>|IIIIIIIIIIIIIIIIII</td><td>0.4629</td><td>|IIIIIIIIIIIIII</td></tr>
<tr><td>22 34</td><td>1</td><td>0.7588</td><td>0.6191</td><td>|IIIIIIIIIIIIIIIIIII</td><td>0.2916</td><td>|IIIIIIIII</td></tr>
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<tr><td>67 98</td><td>1</td><td>0.7353</td><td>0.5871</td><td>|IIIIIIIIIIIIIIIIII</td><td>0.2978</td><td>|IIIIIIIII</td></tr>
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<tr><td>28 40</td><td>1</td><td>0.7112</td><td>0.5446</td><td>|IIIIIIIIIIIIIIII</td><td>0.4722</td><td>|IIIIIIIIIIIIII</td></tr>
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<tr><td>71 103</td><td>1</td><td>0.5659</td><td>0.4716</td><td>|IIIIIIIIIIIIII</td><td>0.1154</td><td>|III</td></tr>
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<tr><td>10 13</td><td>1</td><td>0.5173</td><td>0.3699</td><td>|IIIIIIIIIII</td><td>0.3266</td><td>|IIIIIIIIII</td></tr>
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**Fuzzy Clustering Report**

Page/Date/Time 14 4/14/2005 11:44:57 PM
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Distance Type Euclidean
Scale Type None

**Membership Summary Section for Clusters = 4**

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<tr><td>25 37</td><td>2</td><td>0.7671</td><td>0.6227</td><td>|IIIIIIIIIIIIIIIIIII</td><td>0.2967</td><td>|IIIIIIIII</td></tr>
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## Fuzzy Clustering Report

Page/Date/Time 15 4/14/2005 11:44:57 PM
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Distance Type Euclidean
Scale Type None

**Membership Summary Section for Clusters = 4**

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<tr><td>111 153</td><td>3</td><td>0.9279</td><td>0.8628</td><td>|||||||||||||||||||||||||||</td><td>0.6213</td><td>||||||||||||||||||||</td></tr>
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<tr><td>114 156</td><td>3</td><td>0.5462</td><td>0.3675</td><td>||||||||||||</td><td>0.3967</td><td>|||||||||||||</td></tr>
<tr><td>70 102</td><td>3</td><td>0.4734</td><td>0.3170</td><td>|||||||||||</td><td>0.3443</td><td>|||||||||||</td></tr>
<tr><td>60 89</td><td>3</td><td>0.3734</td><td>0.2721</td><td>|||||||||</td><td>0.2430</td><td>||||||||</td></tr>
<tr><td>91 131</td><td>3</td><td>0.3723</td><td>0.2784</td><td>|||||||||</td><td>0.2072</td><td>|||||||</td></tr>
<tr><td>101 142</td><td>4</td><td>0.7930</td><td>0.6443</td><td>||||||||||||||||||||</td><td>-0.0477</td><td>|</td></tr>
<tr><td>24 36</td><td>4</td><td>0.7624</td><td>0.6027</td><td>|||||||||||||||||||</td><td>-0.2775</td><td>|</td></tr>
<tr><td>42 63</td><td>4</td><td>0.7357</td><td>0.5661</td><td>||||||||||||||||||</td><td>0.0267</td><td>||</td></tr>
<tr><td>52 77</td><td>4</td><td>0.7335</td><td>0.5631</td><td>||||||||||||||||||</td><td>-0.1602</td><td>|</td></tr>
<tr><td>63 92</td><td>4</td><td>0.7214</td><td>0.5470</td><td>|||||||||||||||||</td><td>0.1588</td><td>||||||</td></tr>
<tr><td>88 128</td><td>4</td><td>0.6442</td><td>0.4594</td><td>|||||||||||||||</td><td>-0.0488</td><td>|</td></tr>
<tr><td>120 165</td><td>4</td><td>0.6316</td><td>0.4481</td><td>||||||||||||||</td><td>-0.1707</td><td>|</td></tr>
<tr><td>94 134</td><td>4</td><td>0.5897</td><td>0.4053</td><td>|||||||||||||</td><td>0.1481</td><td>|||||</td></tr>
<tr><td>41 61</td><td>4</td><td>0.5745</td><td>0.3947</td><td>|||||||||||||</td><td>-0.1177</td><td>|</td></tr>
<tr><td>73 105</td><td>4</td><td>0.5294</td><td>0.3580</td><td>||||||||||||</td><td>-0.1756</td><td>|</td></tr>
<tr><td>90 130</td><td>4</td><td>0.5201</td><td>0.3614</td><td>||||||||||||</td><td>-0.3889</td><td>|</td></tr>
<tr><td>104 146</td><td>4</td><td>0.4611</td><td>0.3448</td><td>|||||||||||</td><td>-0.5311</td><td>|</td></tr>
<tr><td>56 84</td><td>4</td><td>0.4143</td><td>0.3138</td><td>||||||||||</td><td>-0.4835</td><td>|</td></tr>
<tr><td>81 120</td><td>4</td><td>0.4115</td><td>0.3131</td><td>||||||||||</td><td>-0.4776</td><td>|</td></tr>
<tr><td>31 43</td><td>4</td><td>0.4056</td><td>0.3024</td><td>||||||||||</td><td>-0.4140</td><td>|</td></tr>
</table>

## Fuzzy Clustering Report

| | |
|---|---|
| Page/Date/Time | 16 4/14/2005 11:44:57 PM |
| Database | |
| Variables | StdFactor1MulSqrtEV1, StdFactor2MulSqrtEV2, StdFactor3MulSqrtEV3 |
| Distance Type | Euclidean |
| Scale Type | None |

**Membership Summary Section for Clusters = 4**

| Row | Cluster | Cluster Membership | Sum of Squared Memberships | Bar of Squared Memberships | Silhouette Amount | Silhouette Bar |
|---|---|---|---|---|---|---|
| 62 91 | 4 | 0.4041 | 0.3181 | \|\|\|\|\|\|\|\|\|\|\| | -0.5261 | \| |
| 18 27 | 4 | 0.3440 | 0.2621 | \|\|\|\|\|\|\|\|\| | 0.0965 | \|\|\|\| |
| 103 144 | 4 | 0.3178 | 0.2601 | \|\|\|\|\|\|\|\|\| | -0.3083 | \| |
| 50 74 | 4 | 0.2954 | 0.2534 | \|\|\|\|\|\|\|\|\| | -0.1726 | \| |

**Membership Matrix Section**

| Row | Cluster | Prob in 1 | Prob in 2 | Prob in 3 | Prob in 4 |
|---|---|---|---|---|---|
| 1 1 | 2 | 0.3267 | 0.5600 | 0.0558 | 0.0575 |
| 2 2 | 2 | 0.2153 | 0.6885 | 0.0429 | 0.0533 |
| 3 3 | 2 | 0.2703 | 0.6009 | 0.0712 | 0.0576 |
| 4 4 | 1 | 0.8708 | 0.0956 | 0.0238 | 0.0097 |
| 5 6 | 3 | 0.0213 | 0.0195 | 0.9494 | 0.0097 |
| 6 7 | 1 | 0.4784 | 0.4029 | 0.0746 | 0.0442 |
| 7 10 | 1 | 0.7603 | 0.1654 | 0.0533 | 0.0210 |
| 8 11 | 2 | 0.1785 | 0.4131 | 0.0958 | 0.3127 |
| 9 12 | 1 | 0.7550 | 0.2126 | 0.0213 | 0.0111 |
| 10 13 | 1 | 0.5173 | 0.2831 | 0.1334 | 0.0662 |
| 11 14 | 2 | 0.3495 | 0.4961 | 0.0868 | 0.0676 |
| 12 15 | 2 | 0.1276 | 0.8122 | 0.0290 | 0.0311 |
| 13 19 | 3 | 0.0442 | 0.0476 | 0.8832 | 0.0251 |
| 14 20 | 2 | 0.2956 | 0.6286 | 0.0379 | 0.0380 |
| 15 21 | 3 | 0.0717 | 0.0553 | 0.8473 | 0.0256 |
| 16 22 | 2 | 0.1902 | 0.7354 | 0.0359 | 0.0385 |
| 17 26 | 3 | 0.0225 | 0.0225 | 0.9442 | 0.0109 |
| 18 27 | 4 | 0.2090 | 0.2335 | 0.2135 | 0.3440 |
| 19 29 | 2 | 0.1478 | 0.6139 | 0.0679 | 0.1704 |
| 20 31 | 3 | 0.0213 | 0.0204 | 0.9484 | 0.0099 |
| 21 32 | 3 | 0.0621 | 0.0825 | 0.7992 | 0.0562 |
| 22 34 | 1 | 0.7588 | 0.2066 | 0.0225 | 0.0121 |
| 23 35 | 3 | 0.1848 | 0.1545 | 0.5779 | 0.0828 |
| 24 36 | 4 | 0.0568 | 0.1218 | 0.0590 | 0.7624 |
| 25 37 | 2 | 0.1817 | 0.7671 | 0.0243 | 0.0269 |
| 26 38 | 2 | 0.3530 | 0.5673 | 0.0454 | 0.0343 |
| 27 39 | 2 | 0.1418 | 0.6486 | 0.0682 | 0.1414 |
| 28 40 | 1 | 0.7112 | 0.1773 | 0.0790 | 0.0325 |
| 29 41 | 2 | 0.2091 | 0.6907 | 0.0529 | 0.0472 |
| 30 42 | 1 | 0.8177 | 0.1303 | 0.0367 | 0.0153 |
| 31 43 | 4 | 0.1165 | 0.1677 | 0.3102 | 0.4056 |
| 32 46 | 1 | 0.6907 | 0.2291 | 0.0518 | 0.0284 |
| 33 47 | 1 | 0.5282 | 0.3284 | 0.0876 | 0.0558 |
| 34 49 | 2 | 0.1460 | 0.7946 | 0.0282 | 0.0312 |
| 35 52 | 2 | 0.2030 | 0.7460 | 0.0262 | 0.0248 |

## Fuzzy Clustering Report

| | |
|---|---|
| Page/Date/Time | 17 4/14/2005 11:44:57 PM |
| Database | |
| Variables | StdFactor1MulSqrtEV1, StdFactor2MulSqrtEV2, StdFactor3MulSqrtEV3 |
| Distance Type | Euclidean |
| Scale Type | None |

**Membership Matrix Section**

| Row | Cluster | Prob in 1 | Prob in 2 | Prob in 3 | Prob in 4 |
|---|---|---|---|---|---|
| 36 54 | 1 | 0.7756 | 0.1585 | 0.0444 | 0.0215 |
| 37 55 | 1 | 0.8687 | 0.0954 | 0.0262 | 0.0098 |
| 38 56 | 1 | 0.4342 | 0.2918 | 0.1770 | 0.0970 |
| 39 58 | 1 | 0.7777 | 0.1602 | 0.0417 | 0.0204 |
| 40 60 | 2 | 0.2078 | 0.6654 | 0.0582 | 0.0686 |
| 41 61 | 4 | 0.1263 | 0.1937 | 0.1055 | 0.5745 |
| 42 63 | 4 | 0.0736 | 0.1203 | 0.0704 | 0.7357 |
| 43 64 | 3 | 0.0197 | 0.0219 | 0.9440 | 0.0144 |
| 44 65 | 2 | 0.1420 | 0.7419 | 0.0516 | 0.0646 |
| 45 67 | 3 | 0.1094 | 0.0853 | 0.7642 | 0.0411 |
| 46 68 | 2 | 0.3018 | 0.6277 | 0.0383 | 0.0322 |
| 47 71 | 3 | 0.0787 | 0.0960 | 0.7609 | 0.0644 |
| 48 72 | 1 | 0.4371 | 0.3160 | 0.1532 | 0.0938 |
| 49 73 | 1 | 0.8110 | 0.1295 | 0.0418 | 0.0177 |
| 50 74 | 4 | 0.2170 | 0.2357 | 0.2520 | 0.2954 |
| 51 75 | 2 | 0.2533 | 0.6991 | 0.0244 | 0.0232 |
| 52 77 | 4 | 0.0578 | 0.0993 | 0.1094 | 0.7335 |
| 53 80 | 2 | 0.1248 | 0.7692 | 0.0389 | 0.0671 |
| 54 82 | 3 | 0.0535 | 0.0493 | 0.8697 | 0.0276 |
| 55 83 | 1 | 0.5269 | 0.4208 | 0.0326 | 0.0197 |
| 56 84 | 4 | 0.1390 | 0.3306 | 0.1161 | 0.4143 |
| 57 85 | 3 | 0.0403 | 0.0505 | 0.8658 | 0.0434 |
| 58 86 | 2 | 0.2397 | 0.5507 | 0.1213 | 0.0882 |
| 59 87 | 1 | 0.5601 | 0.2547 | 0.1261 | 0.0592 |
| 60 89 | 3 | 0.1753 | 0.2178 | 0.3734 | 0.2335 |
| 61 90 | 3 | 0.0234 | 0.0210 | 0.9451 | 0.0105 |
| 62 91 | 4 | 0.1544 | 0.3502 | 0.0913 | 0.4041 |
| 63 92 | 4 | 0.0720 | 0.1071 | 0.0994 | 0.7214 |
| 64 93 | 1 | 0.6033 | 0.2488 | 0.1015 | 0.0465 |
| 65 95 | 1 | 0.8611 | 0.1015 | 0.0258 | 0.0115 |
| 66 97 | 2 | 0.2462 | 0.5167 | 0.1493 | 0.0878 |
| 67 98 | 1 | 0.7353 | 0.2116 | 0.0354 | 0.0177 |
| 68 99 | 1 | 0.4797 | 0.4557 | 0.0367 | 0.0279 |
| 69 101 | 3 | 0.0842 | 0.1166 | 0.6493 | 0.1498 |
| 70 102 | 3 | 0.1707 | 0.1931 | 0.4734 | 0.1628 |
| 71 103 | 1 | 0.5659 | 0.3874 | 0.0299 | 0.0168 |
| 72 104 | 3 | 0.0630 | 0.0491 | 0.8652 | 0.0228 |
| 73 105 | 4 | 0.1109 | 0.1602 | 0.1995 | 0.5294 |
| 74 107 | 1 | 0.6041 | 0.3077 | 0.0610 | 0.0272 |
| 75 110 | 3 | 0.0713 | 0.1054 | 0.7361 | 0.0873 |
| 76 113 | 1 | 0.7863 | 0.1799 | 0.0230 | 0.0107 |
| 77 114 | 1 | 0.6028 | 0.2516 | 0.0974 | 0.0483 |
| 78 115 | 1 | 0.4782 | 0.4022 | 0.0826 | 0.0370 |
| 79 117 | 1 | 0.7552 | 0.2028 | 0.0285 | 0.0136 |

Database
Variables StdFactor1MulSqrtEV1, StdFactor2MulSqrtEV2, StdFactor3MulSqrtEV3
Distance Type Euclidean
Scale Type None

**Membership Matrix Section**

| Row | Cluster | Prob in 1 | Prob in 2 | Prob in 3 | Prob in 4 |
|---|---|---|---|---|---|
| 80 118 | 3 | 0.0377 | 0.0432 | 0.8893 | 0.0298 |
| 81 120 | 4 | 0.1006 | 0.1585 | 0.3294 | 0.4115 |
| 82 121 | 3 | 0.0253 | 0.0297 | 0.9243 | 0.0207 |
| 83 122 | 3 | 0.0881 | 0.0690 | 0.8107 | 0.0321 |
| 84 124 | 1 | 0.3501 | 0.3150 | 0.1914 | 0.1435 |
| 85 125 | 3 | 0.1167 | 0.0920 | 0.7476 | 0.0437 |
| 86 126 | 1 | 0.7850 | 0.1554 | 0.0410 | 0.0186 |
| 87 127 | 3 | 0.0921 | 0.0816 | 0.7829 | 0.0433 |
| 88 128 | 4 | 0.0834 | 0.1223 | 0.1501 | 0.6442 |
| 89 129 | 2 | 0.4021 | 0.4175 | 0.0996 | 0.0808 |
| 90 130 | 4 | 0.1315 | 0.2546 | 0.0938 | 0.5201 |
| 91 131 | 3 | 0.1372 | 0.2276 | 0.3723 | 0.2628 |
| 92 132 | 1 | 0.7565 | 0.1572 | 0.0618 | 0.0245 |
| 93 133 | 3 | 0.0234 | 0.0225 | 0.9409 | 0.0132 |
| 94 134 | 4 | 0.1208 | 0.1670 | 0.1224 | 0.5897 |
| 95 135 | 1 | 0.6909 | 0.2724 | 0.0241 | 0.0126 |
| 96 136 | 3 | 0.0783 | 0.0864 | 0.7618 | 0.0734 |
| 97 138 | 3 | 0.0667 | 0.0710 | 0.8283 | 0.0340 |
| 98 139 | 1 | 0.8055 | 0.1260 | 0.0500 | 0.0185 |
| 99 140 | 1 | 0.7192 | 0.2444 | 0.0235 | 0.0129 |
| 100 141 | 2 | 0.1836 | 0.4380 | 0.0904 | 0.2880 |
| 101 142 | 4 | 0.0544 | 0.0961 | 0.0564 | 0.7930 |
| 102 143 | 2 | 0.3512 | 0.4311 | 0.1088 | 0.1089 |
| 103 144 | 4 | 0.1844 | 0.2240 | 0.2738 | 0.3178 |
| 104 146 | 4 | 0.1225 | 0.3316 | 0.0847 | 0.4611 |
| 105 147 | 1 | 0.7197 | 0.2107 | 0.0520 | 0.0176 |
| 106 148 | 3 | 0.0233 | 0.0265 | 0.9315 | 0.0187 |
| 107 149 | 1 | 0.8090 | 0.1578 | 0.0225 | 0.0107 |
| 108 150 | 1 | 0.7803 | 0.1411 | 0.0560 | 0.0226 |
| 109 151 | 1 | 0.8806 | 0.0873 | 0.0231 | 0.0090 |
| 110 152 | 3 | 0.0537 | 0.0435 | 0.8827 | 0.0201 |
| 111 153 | 3 | 0.0307 | 0.0273 | 0.9279 | 0.0142 |
| 112 154 | 3 | 0.0567 | 0.0754 | 0.7893 | 0.0785 |
| 113 155 | 3 | 0.0695 | 0.0696 | 0.8235 | 0.0374 |
| 114 156 | 3 | 0.1348 | 0.1688 | 0.5462 | 0.1502 |
| 115 158 | 2 | 0.2815 | 0.6033 | 0.0584 | 0.0568 |
| 116 159 | 3 | 0.0414 | 0.0383 | 0.8989 | 0.0214 |
| 117 161 | 2 | 0.2414 | 0.3736 | 0.1411 | 0.2438 |
| 118 163 | 2 | 0.1712 | 0.6364 | 0.0725 | 0.1198 |
| 119 164 | 1 | 0.5494 | 0.4001 | 0.0302 | 0.0203 |
| 120 165 | 4 | 0.0798 | 0.1198 | 0.1689 | 0.6316 |
| 121 168 | 2 | 0.2342 | 0.6079 | 0.0699 | 0.0880 |
| 122 171 | 2 | 0.4071 | 0.4857 | 0.0667 | 0.0404 |
| 123 172 | 2 | 0.1449 | 0.7595 | 0.0456 | 0.0500 |

## Fuzzy Clustering Report

| | |
|---|---|
| Page/Date/Time | 19 4/14/2005 11:44:57 PM |
| Database | |
| Variables | StdFactor1MulSqrtEV1, StdFactor2MulSqrtEV2, StdFactor3MulSqrtEV3 |
| Distance Type | Euclidean |
| Scale Type | None |

**Cluster Medoids Section**

| Variable | Cluster1 | Cluster2 | Cluster3 | Cluster4 | Cluster5 |
|---|---|---|---|---|---|
| StdFactor1MulSqrtEV1 | 0.3543629 | 0.3849433 | -0.9864943 | 0.9920075 | -0.4270975 |
| StdFactor2MulSqrtEV2 | 0.8622726 | 0.6269889 | -2.231869 | -0.6348409 | 0.166977 |
| StdFactor3MulSqrtEV3 | 0.4530997 | -0.5029526 | -8.620162E-02 | 0.137514 | -0.3537138 |
| Row | 6 7 | 107 149 | 120 165 | 5 6 | 44 65 |

**Membership Summary Section for Clusters = 5**

<table>
<tr><th>Row</th><th>Cluster</th><th>Cluster Membership</th><th>Sum of Squared Memberships</th><th>Bar of Squared Memberships</th><th>Silhouette Amount</th><th>Silhouette Bar</th></tr>
<tr><td>6 7</td><td>1</td><td>0.8043</td><td>0.6609</td><td>|IIIIIIIIIIIIIIIIIIII</td><td>0.3130</td><td>|IIIIIIIII</td></tr>
<tr><td>11 14</td><td>1</td><td>0.7993</td><td>0.6524</td><td>|IIIIIIIIIIIIIIIIIIII</td><td>0.4289</td><td>|IIIIIIIIIIIII</td></tr>
<tr><td>115 158</td><td>1</td><td>0.7797</td><td>0.6262</td><td>|IIIIIIIIIIIIIIIIIII</td><td>0.3394</td><td>|IIIIIIIIII</td></tr>
<tr><td>1 1</td><td>1</td><td>0.7676</td><td>0.6095</td><td>|IIIIIIIIIIIIIIIIII</td><td>0.3712</td><td>|IIIIIIIIIII</td></tr>
<tr><td>46 68</td><td>1</td><td>0.7146</td><td>0.5437</td><td>|IIIIIIIIIIIIIIII</td><td>0.1928</td><td>|IIIIII</td></tr>
<tr><td>33 47</td><td>1</td><td>0.7046</td><td>0.5285</td><td>|IIIIIIIIIIIIIIII</td><td>0.3128</td><td>|IIIIIIIII</td></tr>
<tr><td>78 115</td><td>1</td><td>0.6909</td><td>0.5124</td><td>|IIIIIIIIIIIIIII</td><td>0.1332</td><td>|IIII</td></tr>
<tr><td>102 143</td><td>1</td><td>0.6896</td><td>0.5057</td><td>|IIIIIIIIIIIIIII</td><td>0.4621</td><td>|IIIIIIIIIIIIII</td></tr>
<tr><td>74 107</td><td>1</td><td>0.6672</td><td>0.4936</td><td>|IIIIIIIIIIIIIII</td><td>0.0177</td><td>|I</td></tr>
<tr><td>68 99</td><td>1</td><td>0.6625</td><td>0.4881</td><td>|IIIIIIIIIIIIIII</td><td>0.0705</td><td>|II</td></tr>
<tr><td>2 2</td><td>1</td><td>0.6308</td><td>0.4590</td><td>|IIIIIIIIIIIIII</td><td>0.1255</td><td>|IIII</td></tr>
<tr><td>29 41</td><td>1</td><td>0.5900</td><td>0.4213</td><td>|IIIIIIIIIIIII</td><td>0.0453</td><td>|I</td></tr>
<tr><td>64 93</td><td>1</td><td>0.5847</td><td>0.4096</td><td>|IIIIIIIIIIII</td><td>0.1213</td><td>|IIII</td></tr>
<tr><td>10 13</td><td>1</td><td>0.5816</td><td>0.3973</td><td>|IIIIIIIIIIII</td><td>0.2528</td><td>|IIIIIIII</td></tr>
<tr><td>48 72</td><td>1</td><td>0.5791</td><td>0.3891</td><td>|IIIIIIIIIIII</td><td>0.3464</td><td>|IIIIIIIIII</td></tr>
<tr><td>119 164</td><td>1</td><td>0.5235</td><td>0.3839</td><td>|IIIIIIIIIIII</td><td>-0.1399</td><td>|</td></tr>
<tr><td>59 87</td><td>1</td><td>0.5200</td><td>0.3541</td><td>|IIIIIIIIIII</td><td>0.1188</td><td>|IIII</td></tr>
<tr><td>38 56</td><td>1</td><td>0.4998</td><td>0.3245</td><td>|IIIIIIIIII</td><td>0.2700</td><td>|IIIIIIII</td></tr>
<tr><td>117 161</td><td>1</td><td>0.4763</td><td>0.3041</td><td>|IIIIIIIII</td><td>0.3179</td><td>|IIIIIIIIII</td></tr>
<tr><td>100 141</td><td>1</td><td>0.4014</td><td>0.2889</td><td>|IIIIIIIII</td><td>0.0851</td><td>|III</td></tr>
<tr><td>8 11</td><td>1</td><td>0.3967</td><td>0.2875</td><td>|IIIIIIIII</td><td>0.1156</td><td>|III</td></tr>
<tr><td>62 91</td><td>1</td><td>0.3368</td><td>0.2611</td><td>|IIIIIIII</td><td>0.0079</td><td>|</td></tr>
<tr><td>107 149</td><td>2</td><td>0.8861</td><td>0.7902</td><td>|IIIIIIIIIIIIIIIIIIIIIIII</td><td>0.5336</td><td>|IIIIIIIIIIIIIIII</td></tr>
<tr><td>37 55</td><td>2</td><td>0.8621</td><td>0.7502</td><td>|IIIIIIIIIIIIIIIIIIIIIII</td><td>0.6079</td><td>|IIIIIIIIIIIIIIIIII</td></tr>
<tr><td>22 34</td><td>2</td><td>0.8530</td><td>0.7363</td><td>|IIIIIIIIIIIIIIIIIIIIII</td><td>0.4770</td><td>|IIIIIIIIIIIIII</td></tr>
<tr><td>109 151</td><td>2</td><td>0.8526</td><td>0.7353</td><td>|IIIIIIIIIIIIIIIIIIIIII</td><td>0.5997</td><td>|IIIIIIIIIIIIIIIIII</td></tr>
<tr><td>86 126</td><td>2</td><td>0.8517</td><td>0.7330</td><td>|IIIIIIIIIIIIIIIIIIIIII</td><td>0.5844</td><td>|IIIIIIIIIIIIIIIIII</td></tr>
<tr><td>65 95</td><td>2</td><td>0.8423</td><td>0.7189</td><td>|IIIIIIIIIIIIIIIIIIIIII</td><td>0.6082</td><td>|IIIIIIIIIIIIIIIIII</td></tr>
<tr><td>67 98</td><td>2</td><td>0.8396</td><td>0.7150</td><td>|IIIIIIIIIIIIIIIIIIIII</td><td>0.5011</td><td>|IIIIIIIIIIIIIII</td></tr>
<tr><td>39 58</td><td>2</td><td>0.8339</td><td>0.7048</td><td>|IIIIIIIIIIIIIIIIIIIII</td><td>0.5817</td><td>|IIIIIIIIIIIIIIIII</td></tr>
<tr><td>49 73</td><td>2</td><td>0.8290</td><td>0.6970</td><td>|IIIIIIIIIIIIIIIIIIIII</td><td>0.6107</td><td>|IIIIIIIIIIIIIIIIII</td></tr>
<tr><td>36 54</td><td>2</td><td>0.8189</td><td>0.6816</td><td>|IIIIIIIIIIIIIIIIIIII</td><td>0.5847</td><td>|IIIIIIIIIIIIIIIIII</td></tr>
<tr><td>99 140</td><td>2</td><td>0.8153</td><td>0.6790</td><td>|IIIIIIIIIIIIIIIIIIII</td><td>0.4375</td><td>|IIIIIIIIIIIII</td></tr>
<tr><td>9 12</td><td>2</td><td>0.8083</td><td>0.6681</td><td>|IIIIIIIIIIIIIIIIIIII</td><td>0.4518</td><td>|IIIIIIIIIIIIII</td></tr>
<tr><td>32 46</td><td>2</td><td>0.7638</td><td>0.6034</td><td>|IIIIIIIIIIIIIIIIII</td><td>0.4990</td><td>|IIIIIIIIIIIIIII</td></tr>
</table>

**Fuzzy Clustering Report**

Page/Date/Time 20 4/14/2005 11:44:57 PM
Database
Variables StdFactor1MulSqrtEV1, StdFactor2MulSqrtEV2, StdFactor3MulSqrtEV3
Distance Type Euclidean
Scale Type None

**Membership Summary Section for Clusters = 5**

<table>
<tr><th>Row</th><th>Cluster</th><th>Cluster Membership</th><th>Sum of Squared Memberships</th><th>Bar of Squared Memberships</th><th>Silhouette Amount</th><th>Silhouette Bar</th></tr>
<tr><td>4 4</td><td>2</td><td>0.7598</td><td>0.6031</td><td>|||||||||||||||||||</td><td>0.5233</td><td>|||||||||||||||||</td></tr>
<tr><td>105 147</td><td>2</td><td>0.7571</td><td>0.5940</td><td>|||||||||||||||||||</td><td>0.4644</td><td>|||||||||||||||</td></tr>
<tr><td>95 135</td><td>2</td><td>0.7426</td><td>0.5788</td><td>||||||||||||||||||</td><td>0.3924</td><td>|||||||||||||</td></tr>
<tr><td>108 150</td><td>2</td><td>0.7310</td><td>0.5589</td><td>||||||||||||||||||</td><td>0.5685</td><td>||||||||||||||||||</td></tr>
<tr><td>76 113</td><td>2</td><td>0.6706</td><td>0.5002</td><td>||||||||||||||||</td><td>0.4357</td><td>||||||||||||||</td></tr>
<tr><td>71 103</td><td>2</td><td>0.6618</td><td>0.4901</td><td>||||||||||||||||</td><td>0.2872</td><td>||||||||||</td></tr>
<tr><td>98 139</td><td>2</td><td>0.6480</td><td>0.4705</td><td>|||||||||||||||</td><td>0.4724</td><td>|||||||||||||||</td></tr>
<tr><td>55 83</td><td>2</td><td>0.6354</td><td>0.4690</td><td>|||||||||||||||</td><td>0.2487</td><td>||||||||</td></tr>
<tr><td>77 114</td><td>2</td><td>0.6274</td><td>0.4374</td><td>||||||||||||||</td><td>0.4601</td><td>|||||||||||||||</td></tr>
<tr><td>30 42</td><td>2</td><td>0.5574</td><td>0.4131</td><td>|||||||||||||</td><td>0.3667</td><td>||||||||||||</td></tr>
<tr><td>92 132</td><td>2</td><td>0.4824</td><td>0.3626</td><td>||||||||||||</td><td>0.3003</td><td>||||||||||</td></tr>
<tr><td>79 117</td><td>2</td><td>0.4792</td><td>0.3858</td><td>|||||||||||||</td><td>0.2853</td><td>||||||||||</td></tr>
<tr><td>28 40</td><td>2</td><td>0.4669</td><td>0.3430</td><td>|||||||||||</td><td>0.2856</td><td>||||||||||</td></tr>
<tr><td>7 10</td><td>2</td><td>0.4231</td><td>0.3663</td><td>||||||||||||</td><td>0.2284</td><td>||||||||</td></tr>
<tr><td>122 171</td><td>2</td><td>0.4211</td><td>0.3638</td><td>||||||||||||</td><td>0.0740</td><td>|||</td></tr>
<tr><td>89 129</td><td>2</td><td>0.3895</td><td>0.3067</td><td>||||||||||</td><td>0.1032</td><td>||||</td></tr>
<tr><td>84 124</td><td>2</td><td>0.3153</td><td>0.2292</td><td>||||||||</td><td>0.1476</td><td>|||||</td></tr>
<tr><td>120 165</td><td>3</td><td>0.8315</td><td>0.6991</td><td>||||||||||||||||||||||</td><td>-0.1580</td><td>|</td></tr>
<tr><td>88 128</td><td>3</td><td>0.8091</td><td>0.6644</td><td>|||||||||||||||||||||</td><td>-0.0243</td><td>|</td></tr>
<tr><td>73 105</td><td>3</td><td>0.7585</td><td>0.5911</td><td>|||||||||||||||||||</td><td>-0.1437</td><td>|</td></tr>
<tr><td>52 77</td><td>3</td><td>0.7480</td><td>0.5768</td><td>||||||||||||||||||</td><td>-0.2021</td><td>|</td></tr>
<tr><td>31 43</td><td>3</td><td>0.7039</td><td>0.5206</td><td>|||||||||||||||||</td><td>-0.3978</td><td>|</td></tr>
<tr><td>81 120</td><td>3</td><td>0.6553</td><td>0.4654</td><td>|||||||||||||||</td><td>-0.4838</td><td>|</td></tr>
<tr><td>63 92</td><td>3</td><td>0.6163</td><td>0.4183</td><td>||||||||||||||</td><td>0.0851</td><td>||||</td></tr>
<tr><td>101 142</td><td>3</td><td>0.4731</td><td>0.3015</td><td>||||||||||</td><td>-0.2025</td><td>|</td></tr>
<tr><td>42 63</td><td>3</td><td>0.4343</td><td>0.2775</td><td>|||||||||</td><td>-0.1199</td><td>|</td></tr>
<tr><td>103 144</td><td>3</td><td>0.4268</td><td>0.2683</td><td>|||||||||</td><td>-0.2750</td><td>|</td></tr>
<tr><td>94 134</td><td>3</td><td>0.4103</td><td>0.2589</td><td>|||||||||</td><td>0.0774</td><td>|||</td></tr>
<tr><td>24 36</td><td>3</td><td>0.3921</td><td>0.2686</td><td>|||||||||</td><td>-0.4241</td><td>|</td></tr>
<tr><td>60 89</td><td>3</td><td>0.3732</td><td>0.2487</td><td>||||||||</td><td>-0.5059</td><td>|</td></tr>
<tr><td>50 74</td><td>3</td><td>0.3230</td><td>0.2208</td><td>||||||||</td><td>-0.1411</td><td>|</td></tr>
<tr><td>41 61</td><td>3</td><td>0.2764</td><td>0.2199</td><td>||||||||</td><td>-0.2300</td><td>|</td></tr>
<tr><td>18 27</td><td>3</td><td>0.2560</td><td>0.2046</td><td>|||||||</td><td>0.0838</td><td>||||</td></tr>
<tr><td>5 6</td><td>4</td><td>0.9486</td><td>0.9006</td><td>||||||||||||||||||||||||||||</td><td>0.6429</td><td>||||||||||||||||||||</td></tr>
<tr><td>61 90</td><td>4</td><td>0.9442</td><td>0.8924</td><td>||||||||||||||||||||||||||||</td><td>0.6411</td><td>||||||||||||||||||||</td></tr>
<tr><td>20 31</td><td>4</td><td>0.9438</td><td>0.8916</td><td>||||||||||||||||||||||||||||</td><td>0.6324</td><td>||||||||||||||||||||</td></tr>
<tr><td>17 26</td><td>4</td><td>0.9375</td><td>0.8799</td><td>|||||||||||||||||||||||||||</td><td>0.6302</td><td>||||||||||||||||||||</td></tr>
<tr><td>93 133</td><td>4</td><td>0.9309</td><td>0.8679</td><td>|||||||||||||||||||||||||||</td><td>0.6512</td><td>|||||||||||||||||||||</td></tr>
<tr><td>43 64</td><td>4</td><td>0.9266</td><td>0.8599</td><td>|||||||||||||||||||||||||||</td><td>0.6644</td><td>|||||||||||||||||||||</td></tr>
<tr><td>111 153</td><td>4</td><td>0.9244</td><td>0.8561</td><td>|||||||||||||||||||||||||||</td><td>0.6404</td><td>||||||||||||||||||||</td></tr>
<tr><td>106 148</td><td>4</td><td>0.9073</td><td>0.8253</td><td>||||||||||||||||||||||||||</td><td>0.6599</td><td>|||||||||||||||||||||</td></tr>
<tr><td>82 121</td><td>4</td><td>0.9011</td><td>0.8145</td><td>|||||||||||||||||||||||||</td><td>0.6604</td><td>|||||||||||||||||||||</td></tr>
</table>

## Fuzzy Clustering Report

| | |
|---|---|
| Page/Date/Time | 21 4/14/2005 11:44:57 PM |
| Database | |
| Variables | StdFactor1MulSqrtEV1, StdFactor2MulSqrtEV2, StdFactor3MulSqrtEV3 |
| Distance Type | Euclidean |
| Scale Type | None |

**Membership Summary Section for Clusters = 5**

| Row | Cluster | Cluster Membership | Sum of Squared Memberships | Bar of Squared Memberships | Silhouette Amount | Silhouette Bar |
|---|---|---|---|---|---|---|
| 116 159 | 4 | 0.8736 | 0.7672 | \|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\| | 0.5943 | \|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\| |
| 110 152 | 4 | 0.8733 | 0.7670 | \|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\| | 0.5829 | \|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\| |
| 72 104 | 4 | 0.8511 | 0.7303 | \|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\| | 0.5545 | \|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\| |
| 80 118 | 4 | 0.8400 | 0.7122 | \|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\| | 0.6109 | \|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\| |
| 13 19 | 4 | 0.8386 | 0.7099 | \|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\| | 0.5675 | \|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\| |
| 15 21 | 4 | 0.8329 | 0.7011 | \|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\| | 0.5474 | \|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\| |
| 54 82 | 4 | 0.8316 | 0.6987 | \|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\| | 0.5642 | \|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\| |
| 57 85 | 4 | 0.8147 | 0.6725 | \|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\| | 0.6222 | \|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\| |
| 97 138 | 4 | 0.7934 | 0.6409 | \|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\| | 0.5649 | \|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\| |
| 113 155 | 4 | 0.7902 | 0.6360 | \|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\| | 0.5805 | \|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\| |
| 83 122 | 4 | 0.7872 | 0.6319 | \|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\| | 0.5356 | \|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\| |
| 45 67 | 4 | 0.7318 | 0.5550 | \|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\| | 0.5088 | \|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\| |
| 87 127 | 4 | 0.7203 | 0.5390 | \|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\| | 0.4766 | \|\|\|\|\|\|\|\|\|\|\|\|\|\|\| |
| 85 125 | 4 | 0.7096 | 0.5267 | \|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\| | 0.4996 | \|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\| |
| 96 136 | 4 | 0.7073 | 0.5219 | \|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\| | 0.5831 | \|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\| |
| 21 32 | 4 | 0.7059 | 0.5209 | \|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\| | 0.5130 | \|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\| |
| 47 71 | 4 | 0.7030 | 0.5169 | \|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\| | 0.5494 | \|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\| |
| 112 154 | 4 | 0.6938 | 0.5078 | \|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\| | 0.5588 | \|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\| |
| 75 110 | 4 | 0.6393 | 0.4430 | \|\|\|\|\|\|\|\|\|\|\|\|\|\| | 0.4841 | \|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\| |
| 69 101 | 4 | 0.5525 | 0.3616 | \|\|\|\|\|\|\|\|\|\|\|\| | 0.4981 | \|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\| |
| 23 35 | 4 | 0.5105 | 0.3276 | \|\|\|\|\|\|\|\|\|\|\| | 0.3634 | \|\|\|\|\|\|\|\|\|\|\|\| |
| 114 156 | 4 | 0.3939 | 0.2619 | \|\|\|\|\|\|\|\|\| | 0.3335 | \|\|\|\|\|\|\|\|\|\|\| |
| 70 102 | 4 | 0.3331 | 0.2359 | \|\|\|\|\|\|\|\| | 0.2698 | \|\|\|\|\|\|\|\|\| |
| 91 131 | 4 | 0.3112 | 0.2216 | \|\|\|\|\|\|\|\| | 0.2310 | \|\|\|\|\|\|\|\| |
| 44 65 | 5 | 0.8064 | 0.6618 | \|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\| | 0.4641 | \|\|\|\|\|\|\|\|\|\|\|\|\|\|\| |
| 53 80 | 5 | 0.7511 | 0.5857 | \|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\| | 0.4768 | \|\|\|\|\|\|\|\|\|\|\|\|\|\|\| |
| 118 163 | 5 | 0.7493 | 0.5792 | \|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\| | 0.4575 | \|\|\|\|\|\|\|\|\|\|\|\|\|\|\| |
| 27 39 | 5 | 0.7479 | 0.5770 | \|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\| | 0.4983 | \|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\| |
| 16 22 | 5 | 0.7307 | 0.5628 | \|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\| | 0.3421 | \|\|\|\|\|\|\|\|\|\|\| |
| 40 60 | 5 | 0.7306 | 0.5591 | \|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\| | 0.3677 | \|\|\|\|\|\|\|\|\|\|\|\| |
| 121 168 | 5 | 0.6735 | 0.4896 | \|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\| | 0.3184 | \|\|\|\|\|\|\|\|\|\|\| |
| 12 15 | 5 | 0.6534 | 0.4752 | \|\|\|\|\|\|\|\|\|\|\|\|\|\|\| | 0.3659 | \|\|\|\|\|\|\|\|\|\|\|\| |
| 35 52 | 5 | 0.6443 | 0.4700 | \|\|\|\|\|\|\|\|\|\|\|\|\|\|\| | 0.2341 | \|\|\|\|\|\|\|\| |
| 25 37 | 5 | 0.6013 | 0.4262 | \|\|\|\|\|\|\|\|\|\|\|\|\|\| | 0.2685 | \|\|\|\|\|\|\|\|\| |
| 3 3 | 5 | 0.5983 | 0.4229 | \|\|\|\|\|\|\|\|\|\|\|\|\|\| | 0.2035 | \|\|\|\|\|\|\| |
| 58 86 | 5 | 0.5950 | 0.4040 | \|\|\|\|\|\|\|\|\|\|\|\|\| | 0.2536 | \|\|\|\|\|\|\|\|\| |
| 66 97 | 5 | 0.5469 | 0.3598 | \|\|\|\|\|\|\|\|\|\|\|\| | 0.2076 | \|\|\|\|\|\|\| |
| 14 20 | 5 | 0.5284 | 0.3841 | \|\|\|\|\|\|\|\|\|\|\|\|\| | 0.1247 | \|\|\|\|\| |
| 19 29 | 5 | 0.5128 | 0.3567 | \|\|\|\|\|\|\|\|\|\|\|\| | 0.2158 | \|\|\|\|\|\|\| |
| 123 172 | 5 | 0.4948 | 0.3627 | \|\|\|\|\|\|\|\|\|\|\|\| | 0.2263 | \|\|\|\|\|\|\|\| |
| 34 49 | 5 | 0.4747 | 0.3642 | \|\|\|\|\|\|\|\|\|\|\|\| | 0.2168 | \|\|\|\|\|\|\|\| |
| 26 38 | 5 | 0.4724 | 0.3766 | \|\|\|\|\|\|\|\|\|\|\|\| | -0.0148 | \| |

**Fuzzy Clustering Report**

| | |
|---|---|
| Page/Date/Time | 22 4/14/2005 11:44:57 PM |
| Database | |
| Variables | StdFactor1MulSqrtEV1, StdFactor2MulSqrtEV2, StdFactor3MulSqrtEV3 |
| Distance Type | Euclidean |
| Scale Type | None |

**Membership Summary Section for Clusters = 5**

| Row | Cluster | Cluster Membership | Sum of Squared Memberships | Bar of Squared Memberships | Silhouette Amount | Silhouette Bar |
|---|---|---|---|---|---|---|
| 51 75 | 5 | 0.4223 | 0.3228 | \|IIIIIIIIII | 0.0879 | \|III |
| 56 84 | 5 | 0.4098 | 0.2862 | \|IIIIIIIII | 0.3776 | \|IIIIIIIIIII |
| 104 146 | 5 | 0.3782 | 0.2596 | \|IIIIIIII | 0.1269 | \|IIII |
| 90 130 | 5 | 0.2928 | 0.2328 | \|IIIIIII | -0.0582 | \| |

**Membership Matrix Section**

| Row | Cluster | Prob in 1 | Prob in 2 | Prob in 3 | Prob in 4 | Prob in 5 |
|---|---|---|---|---|---|---|
| 1 1 | 1 | 0.7676 | 0.0877 | 0.0139 | 0.0213 | 0.1095 |
| 2 2 | 1 | 0.6308 | 0.1008 | 0.0195 | 0.0257 | 0.2232 |
| 3 3 | 5 | 0.0888 | 0.2319 | 0.0372 | 0.0438 | 0.5983 |
| 4 4 | 2 | 0.1470 | 0.7598 | 0.0091 | 0.0250 | 0.0590 |
| 5 6 | 4 | 0.0137 | 0.0149 | 0.0092 | 0.9486 | 0.0135 |
| 6 7 | 1 | 0.8043 | 0.0949 | 0.0105 | 0.0246 | 0.0656 |
| 7 10 | 2 | 0.4201 | 0.4231 | 0.0169 | 0.0507 | 0.0892 |
| 8 11 | 1 | 0.3967 | 0.1169 | 0.0947 | 0.0717 | 0.3200 |
| 9 12 | 2 | 0.0871 | 0.8083 | 0.0067 | 0.0144 | 0.0835 |
| 10 13 | 1 | 0.5816 | 0.2007 | 0.0308 | 0.0797 | 0.1073 |
| 11 14 | 1 | 0.7993 | 0.0745 | 0.0143 | 0.0278 | 0.0842 |
| 12 15 | 5 | 0.1842 | 0.1150 | 0.0209 | 0.0266 | 0.6534 |
| 13 19 | 4 | 0.0341 | 0.0431 | 0.0365 | 0.8386 | 0.0478 |
| 14 20 | 5 | 0.1203 | 0.2983 | 0.0245 | 0.0284 | 0.5284 |
| 15 21 | 4 | 0.0489 | 0.0536 | 0.0251 | 0.8329 | 0.0396 |
| 16 22 | 5 | 0.0804 | 0.1466 | 0.0203 | 0.0219 | 0.7307 |
| 17 26 | 4 | 0.0164 | 0.0174 | 0.0114 | 0.9375 | 0.0173 |
| 18 27 | 3 | 0.1917 | 0.1721 | 0.2560 | 0.1760 | 0.2042 |
| 19 29 | 5 | 0.2794 | 0.0972 | 0.0618 | 0.0487 | 0.5128 |
| 20 31 | 4 | 0.0144 | 0.0161 | 0.0103 | 0.9438 | 0.0153 |
| 21 32 | 4 | 0.0553 | 0.0607 | 0.0881 | 0.7059 | 0.0900 |
| 22 34 | 2 | 0.0570 | 0.8530 | 0.0059 | 0.0119 | 0.0721 |
| 23 35 | 4 | 0.1846 | 0.1294 | 0.0684 | 0.5105 | 0.1071 |
| 24 36 | 3 | 0.1526 | 0.0887 | 0.3921 | 0.0925 | 0.2741 |
| 25 37 | 5 | 0.1756 | 0.1814 | 0.0190 | 0.0227 | 0.6013 |
| 26 38 | 5 | 0.0951 | 0.3780 | 0.0230 | 0.0316 | 0.4724 |
| 27 39 | 5 | 0.0880 | 0.0768 | 0.0535 | 0.0339 | 0.7479 |
| 28 40 | 2 | 0.3284 | 0.4669 | 0.0261 | 0.0722 | 0.1064 |
| 29 41 | 1 | 0.5900 | 0.1089 | 0.0214 | 0.0355 | 0.2441 |
| 30 42 | 2 | 0.3064 | 0.5574 | 0.0143 | 0.0397 | 0.0821 |
| 31 43 | 3 | 0.0453 | 0.0494 | 0.7039 | 0.1153 | 0.0861 |
| 32 46 | 2 | 0.0758 | 0.7638 | 0.0165 | 0.0297 | 0.1141 |
| 33 47 | 1 | 0.7046 | 0.1502 | 0.0188 | 0.0400 | 0.0865 |
| 34 49 | 5 | 0.3483 | 0.1276 | 0.0213 | 0.0281 | 0.4747 |
| 35 52 | 5 | 0.1149 | 0.2023 | 0.0169 | 0.0216 | 0.6443 |

## Fuzzy Clustering Report

Page/Date/Time 23 4/14/2005 11:44:57 PM
Database
Variables StdFactor1MulSqrtEV1, StdFactor2MulSqrtEV2, StdFactor3MulSqrtEV3
Distance Type Euclidean
Scale Type None

**Membership Matrix Section**

| Row | Cluster | Prob in 1 | Prob in 2 | Prob in 3 | Prob in 4 | Prob in 5 |
|---|---|---|---|---|---|---|
| 36 54 | 2 | 0.0704 | 0.8189 | 0.0124 | 0.0258 | 0.0726 |
| 37 55 | 2 | 0.0677 | 0.8621 | 0.0066 | 0.0187 | 0.0449 |
| 38 56 | 1 | 0.4998 | 0.2035 | 0.0490 | 0.1147 | 0.1331 |
| 39 58 | 2 | 0.0629 | 0.8339 | 0.0111 | 0.0228 | 0.0693 |
| 40 60 | 5 | 0.0721 | 0.1344 | 0.0331 | 0.0297 | 0.7306 |
| 41 61 | 3 | 0.2229 | 0.1350 | 0.2764 | 0.1170 | 0.2488 |
| 42 63 | 3 | 0.1473 | 0.1037 | 0.4343 | 0.0984 | 0.2162 |
| 43 64 | 4 | 0.0166 | 0.0174 | 0.0191 | 0.9266 | 0.0203 |
| 44 65 | 5 | 0.0674 | 0.0757 | 0.0261 | 0.0244 | 0.8064 |
| 45 67 | 4 | 0.0887 | 0.0807 | 0.0382 | 0.7318 | 0.0607 |
| 46 68 | 1 | 0.7146 | 0.1124 | 0.0119 | 0.0202 | 0.1410 |
| 47 71 | 4 | 0.0923 | 0.0624 | 0.0623 | 0.7030 | 0.0800 |
| 48 72 | 1 | 0.5791 | 0.1732 | 0.0397 | 0.0871 | 0.1208 |
| 49 73 | 2 | 0.0726 | 0.8290 | 0.0110 | 0.0263 | 0.0611 |
| 50 74 | 3 | 0.1347 | 0.1691 | 0.3230 | 0.1791 | 0.1941 |
| 51 75 | 5 | 0.2833 | 0.2515 | 0.0179 | 0.0250 | 0.4223 |
| 52 77 | 3 | 0.0518 | 0.0398 | 0.7480 | 0.0723 | 0.0881 |
| 53 80 | 5 | 0.1184 | 0.0782 | 0.0282 | 0.0241 | 0.7511 |
| 54 82 | 4 | 0.0364 | 0.0494 | 0.0376 | 0.8316 | 0.0450 |
| 55 83 | 2 | 0.0923 | 0.6354 | 0.0128 | 0.0228 | 0.2367 |
| 56 84 | 5 | 0.1041 | 0.1074 | 0.2992 | 0.0795 | 0.4098 |
| 57 85 | 4 | 0.0417 | 0.0363 | 0.0580 | 0.8147 | 0.0494 |
| 58 86 | 5 | 0.0902 | 0.1816 | 0.0618 | 0.0715 | 0.5950 |
| 59 87 | 1 | 0.5200 | 0.2509 | 0.0325 | 0.0848 | 0.1117 |
| 60 89 | 3 | 0.0891 | 0.1285 | 0.3732 | 0.2294 | 0.1798 |
| 61 90 | 4 | 0.0150 | 0.0164 | 0.0099 | 0.9442 | 0.0144 |
| 62 91 | 1 | 0.3368 | 0.1210 | 0.1324 | 0.0793 | 0.3305 |
| 63 92 | 3 | 0.0899 | 0.0706 | 0.6163 | 0.0956 | 0.1276 |
| 64 93 | 1 | 0.5847 | 0.2326 | 0.0236 | 0.0639 | 0.0953 |
| 65 95 | 2 | 0.0801 | 0.8423 | 0.0079 | 0.0190 | 0.0508 |
| 66 97 | 5 | 0.0988 | 0.1947 | 0.0665 | 0.0931 | 0.5469 |
| 67 98 | 2 | 0.0508 | 0.8396 | 0.0084 | 0.0171 | 0.0840 |
| 68 99 | 1 | 0.6625 | 0.1848 | 0.0117 | 0.0210 | 0.1199 |
| 69 101 | 4 | 0.0928 | 0.0698 | 0.1759 | 0.5525 | 0.1089 |
| 70 102 | 4 | 0.0941 | 0.1428 | 0.2554 | 0.3331 | 0.1746 |
| 71 103 | 2 | 0.1026 | 0.6618 | 0.0111 | 0.0219 | 0.2027 |
| 72 104 | 4 | 0.0412 | 0.0487 | 0.0228 | 0.8511 | 0.0362 |
| 73 105 | 3 | 0.0426 | 0.0456 | 0.7585 | 0.0735 | 0.0797 |
| 74 107 | 1 | 0.6672 | 0.1990 | 0.0123 | 0.0347 | 0.0868 |
| 75 110 | 4 | 0.0737 | 0.0644 | 0.1141 | 0.6393 | 0.1085 |
| 76 113 | 2 | 0.2017 | 0.6706 | 0.0091 | 0.0228 | 0.0958 |
| 77 114 | 2 | 0.1111 | 0.6274 | 0.0349 | 0.0657 | 0.1609 |
| 78 115 | 1 | 0.6909 | 0.1512 | 0.0145 | 0.0416 | 0.1019 |
| 79 117 | 2 | 0.3809 | 0.4792 | 0.0111 | 0.0280 | 0.1009 |

**Fuzzy Clustering Report**

| | |
|---|---|
| Page/Date/Time | 24 4/14/2005 11:44:57 PM |
| Database | |
| Variables | StdFactor1MulSqrtEV1, StdFactor2MulSqrtEV2, StdFactor3MulSqrtEV3 |
| Distance Type | Euclidean |
| Scale Type | None |

**Membership Matrix Section**

| Row | Cluster | Prob in 1 | Prob in 2 | Prob in 3 | Prob in 4 | Prob in 5 |
|---|---|---|---|---|---|---|
| 80 118 | 4 | 0.0316 | 0.0370 | 0.0462 | 0.8400 | 0.0452 |
| 81 120 | 3 | 0.0511 | 0.0499 | 0.6553 | 0.1464 | 0.0973 |
| 82 121 | 4 | 0.0238 | 0.0221 | 0.0255 | 0.9011 | 0.0275 |
| 83 122 | 4 | 0.0687 | 0.0651 | 0.0297 | 0.7872 | 0.0493 |
| 84 124 | 2 | 0.1458 | 0.3153 | 0.1323 | 0.1388 | 0.2678 |
| 85 125 | 4 | 0.0998 | 0.0856 | 0.0394 | 0.7096 | 0.0656 |
| 86 126 | 2 | 0.0539 | 0.8517 | 0.0094 | 0.0209 | 0.0641 |
| 87 127 | 4 | 0.0581 | 0.0874 | 0.0582 | 0.7203 | 0.0760 |
| 88 128 | 3 | 0.0369 | 0.0346 | 0.8091 | 0.0580 | 0.0615 |
| 89 129 | 2 | 0.1193 | 0.3895 | 0.0592 | 0.0677 | 0.3643 |
| 90 130 | 5 | 0.2893 | 0.1255 | 0.1954 | 0.0970 | 0.2928 |
| 91 131 | 4 | 0.2009 | 0.1047 | 0.1873 | 0.3112 | 0.1961 |
| 92 132 | 2 | 0.3417 | 0.4824 | 0.0205 | 0.0594 | 0.0960 |
| 93 133 | 4 | 0.0164 | 0.0190 | 0.0153 | 0.9309 | 0.0184 |
| 94 134 | 3 | 0.1510 | 0.1216 | 0.4103 | 0.1216 | 0.1955 |
| 95 135 | 2 | 0.1059 | 0.7426 | 0.0082 | 0.0179 | 0.1254 |
| 96 136 | 4 | 0.0828 | 0.0625 | 0.0751 | 0.7073 | 0.0722 |
| 97 138 | 4 | 0.0682 | 0.0515 | 0.0319 | 0.7934 | 0.0550 |
| 98 139 | 2 | 0.2025 | 0.6480 | 0.0167 | 0.0495 | 0.0833 |
| 99 140 | 2 | 0.0657 | 0.8153 | 0.0067 | 0.0136 | 0.0988 |
| 100 141 | 1 | 0.4014 | 0.1209 | 0.0940 | 0.0680 | 0.3157 |
| 101 142 | 3 | 0.1408 | 0.0900 | 0.4731 | 0.0939 | 0.2022 |
| 102 143 | 1 | 0.6896 | 0.1109 | 0.0307 | 0.0479 | 0.1208 |
| 103 144 | 3 | 0.0975 | 0.1300 | 0.4268 | 0.1685 | 0.1772 |
| 104 146 | 5 | 0.2647 | 0.1086 | 0.1681 | 0.0804 | 0.3782 |
| 105 147 | 2 | 0.0873 | 0.7571 | 0.0117 | 0.0352 | 0.1087 |
| 106 148 | 4 | 0.0202 | 0.0213 | 0.0255 | 0.9073 | 0.0258 |
| 107 149 | 2 | 0.0438 | 0.8861 | 0.0048 | 0.0108 | 0.0545 |
| 108 150 | 2 | 0.1240 | 0.7310 | 0.0171 | 0.0442 | 0.0838 |
| 109 151 | 2 | 0.0767 | 0.8526 | 0.0066 | 0.0182 | 0.0460 |
| 110 152 | 4 | 0.0379 | 0.0393 | 0.0187 | 0.8733 | 0.0308 |
| 111 153 | 4 | 0.0215 | 0.0217 | 0.0131 | 0.9244 | 0.0191 |
| 112 154 | 4 | 0.0547 | 0.0524 | 0.1208 | 0.6938 | 0.0783 |
| 113 155 | 4 | 0.0704 | 0.0523 | 0.0344 | 0.7902 | 0.0527 |
| 114 156 | 4 | 0.0828 | 0.1151 | 0.2449 | 0.3939 | 0.1632 |
| 115 158 | 1 | 0.7797 | 0.0743 | 0.0139 | 0.0219 | 0.1102 |
| 116 159 | 4 | 0.0283 | 0.0370 | 0.0267 | 0.8736 | 0.0343 |
| 117 161 | 1 | 0.4763 | 0.1332 | 0.0896 | 0.0949 | 0.2060 |
| 118 163 | 5 | 0.0725 | 0.0937 | 0.0505 | 0.0340 | 0.7493 |
| 119 164 | 1 | 0.5235 | 0.2976 | 0.0121 | 0.0233 | 0.1435 |
| 120 165 | 3 | 0.0311 | 0.0287 | 0.8315 | 0.0565 | 0.0523 |
| 121 168 | 5 | 0.0839 | 0.1596 | 0.0453 | 0.0377 | 0.6735 |
| 122 171 | 2 | 0.0888 | 0.4211 | 0.0272 | 0.0434 | 0.4195 |
| 123 172 | 5 | 0.3199 | 0.1137 | 0.0308 | 0.0408 | 0.4948 |

## Fuzzy Clustering Report

| | |
|---|---|
| Page/Date/Time | 25 4/14/2005 11:44:57 PM |
| Database | |
| Variables | StdFactor1MulSqrtEV1, StdFactor2MulSqrtEV2, StdFactor3MulSqrtEV3 |
| Distance Type | Euclidean |
| Scale Type | None |

**Cluster Medoids Section**

| Variable | Cluster1 | Cluster2 | Cluster3 | Cluster4 | Cluster5 | Cluster6 |
|---|---|---|---|---|---|---|
| StdFactor1MulSqrtEV1 | 0.3543629 | 0.6668115 | -0.9864943 | -0.2854514 | 0.9920075 | -0.6403463 |
| StdFactor2MulSqrtEV2 | 0.8622726 | 0.667519 | -2.231869 | 0.6692916 | -0.6348409 | 0.1294283 |
| StdFactor3MulSqrtEV3 | 0.4530997 | -0.4161009 | -8.620162E-02 | -0.2978846 | 0.137514 | -0.632118 |
| Row | 6 7 | 37 55 | 120 165 | 25 37 | 5 6 | 118 163 |

**Membership Summary Section for Clusters = 6**

<table>
<tr><th>Row</th><th>Cluster</th><th>Cluster Membership</th><th>Sum of Squared Memberships</th><th>Bar of Squared Memberships</th><th>Silhouette Amount</th><th>Silhouette Bar</th></tr>
<tr><td>6 7</td><td>1</td><td>0.7535</td><td>0.5851</td><td>|IIIIIIIIIIIIIIIIII</td><td>0.3266</td><td>|IIIIIIIIII</td></tr>
<tr><td>11 14</td><td>1</td><td>0.7450</td><td>0.5734</td><td>|IIIIIIIIIIIIIIIII</td><td>0.3396</td><td>|IIIIIIIIII</td></tr>
<tr><td>1 1</td><td>1</td><td>0.6777</td><td>0.4915</td><td>|IIIIIIIIIIIIIII</td><td>0.2072</td><td>|IIIIII</td></tr>
<tr><td>115 158</td><td>1</td><td>0.6628</td><td>0.4759</td><td>|IIIIIIIIIIIIII</td><td>0.1679</td><td>|IIIII</td></tr>
<tr><td>33 47</td><td>1</td><td>0.6611</td><td>0.4689</td><td>|IIIIIIIIIIIIII</td><td>0.3322</td><td>|IIIIIIIIII</td></tr>
<tr><td>102 143</td><td>1</td><td>0.6228</td><td>0.4247</td><td>|IIIIIIIIIIIII</td><td>0.4066</td><td>|IIIIIIIIIIII</td></tr>
<tr><td>78 115</td><td>1</td><td>0.5949</td><td>0.4006</td><td>|IIIIIIIIIIII</td><td>0.1204</td><td>|IIII</td></tr>
<tr><td>74 107</td><td>1</td><td>0.5828</td><td>0.3935</td><td>|IIIIIIIIIIII</td><td>0.0348</td><td>|I</td></tr>
<tr><td>46 68</td><td>1</td><td>0.5492</td><td>0.3724</td><td>|IIIIIIIIIII</td><td>-0.1298</td><td>|</td></tr>
<tr><td>64 93</td><td>1</td><td>0.5381</td><td>0.3525</td><td>|IIIIIIIIIII</td><td>0.1383</td><td>|IIII</td></tr>
<tr><td>10 13</td><td>1</td><td>0.5348</td><td>0.3424</td><td>|IIIIIIIIII</td><td>0.2707</td><td>|IIIIIIII</td></tr>
<tr><td>48 72</td><td>1</td><td>0.5337</td><td>0.3371</td><td>|IIIIIIIIII</td><td>0.3594</td><td>|IIIIIIIIIII</td></tr>
<tr><td>68 99</td><td>1</td><td>0.5303</td><td>0.3517</td><td>|IIIIIIIIIII</td><td>-0.0558</td><td>|</td></tr>
<tr><td>2 2</td><td>1</td><td>0.4768</td><td>0.3245</td><td>|IIIIIIIIII</td><td>-0.1420</td><td>|</td></tr>
<tr><td>59 87</td><td>1</td><td>0.4697</td><td>0.2986</td><td>|IIIIIIIII</td><td>0.1336</td><td>|IIII</td></tr>
<tr><td>38 56</td><td>1</td><td>0.4519</td><td>0.2750</td><td>|IIIIIIII</td><td>0.2816</td><td>|IIIIIIII</td></tr>
<tr><td>29 41</td><td>1</td><td>0.4154</td><td>0.2950</td><td>|IIIIIIIII</td><td>-0.2212</td><td>|</td></tr>
<tr><td>119 164</td><td>1</td><td>0.4020</td><td>0.2802</td><td>|IIIIIIII</td><td>-0.2170</td><td>|</td></tr>
<tr><td>117 161</td><td>1</td><td>0.3895</td><td>0.2406</td><td>|IIIIIII</td><td>0.2830</td><td>|IIIIIIII</td></tr>
<tr><td>8 11</td><td>1</td><td>0.3145</td><td>0.2281</td><td>|IIIIIII</td><td>0.0869</td><td>|III</td></tr>
<tr><td>100 141</td><td>1</td><td>0.2949</td><td>0.2281</td><td>|IIIIIII</td><td>0.0529</td><td>|II</td></tr>
<tr><td>37 55</td><td>2</td><td>0.8471</td><td>0.7242</td><td>|IIIIIIIIIIIIIIIIIIIIII</td><td>0.4908</td><td>|IIIIIIIIIIIIIII</td></tr>
<tr><td>109 151</td><td>2</td><td>0.8463</td><td>0.7229</td><td>|IIIIIIIIIIIIIIIIIIIIII</td><td>0.5046</td><td>|IIIIIIIIIIIIIII</td></tr>
<tr><td>65 95</td><td>2</td><td>0.8359</td><td>0.7063</td><td>|IIIIIIIIIIIIIIIIIIIII</td><td>0.5089</td><td>|IIIIIIIIIIIIIII</td></tr>
<tr><td>49 73</td><td>2</td><td>0.8096</td><td>0.6651</td><td>|IIIIIIIIIIIIIIIIIIII</td><td>0.5064</td><td>|IIIIIIIIIIIIIII</td></tr>
<tr><td>86 126</td><td>2</td><td>0.8054</td><td>0.6593</td><td>|IIIIIIIIIIIIIIIIIIII</td><td>0.4475</td><td>|IIIIIIIIIIIII</td></tr>
<tr><td>107 149</td><td>2</td><td>0.8006</td><td>0.6537</td><td>|IIIIIIIIIIIIIIIIIIII</td><td>0.3143</td><td>|IIIIIIIII</td></tr>
<tr><td>39 58</td><td>2</td><td>0.7861</td><td>0.6308</td><td>|IIIIIIIIIIIIIIIIIII</td><td>0.4481</td><td>|IIIIIIIIIIIII</td></tr>
<tr><td>36 54</td><td>2</td><td>0.7755</td><td>0.6153</td><td>|IIIIIIIIIIIIIIIIII</td><td>0.4603</td><td>|IIIIIIIIIIIIII</td></tr>
<tr><td>4 4</td><td>2</td><td>0.7538</td><td>0.5867</td><td>|IIIIIIIIIIIIIIIIII</td><td>0.4705</td><td>|IIIIIIIIIIIIII</td></tr>
<tr><td>67 98</td><td>2</td><td>0.7232</td><td>0.5477</td><td>|IIIIIIIIIIIIIIII</td><td>0.2705</td><td>|IIIIIIII</td></tr>
<tr><td>108 150</td><td>2</td><td>0.7101</td><td>0.5260</td><td>|IIIIIIIIIIIIIIII</td><td>0.4973</td><td>|IIIIIIIIIIIIIII</td></tr>
<tr><td>22 34</td><td>2</td><td>0.7047</td><td>0.5272</td><td>|IIIIIIIIIIIIIIII</td><td>0.1910</td><td>|IIIIII</td></tr>
<tr><td>32 46</td><td>2</td><td>0.6569</td><td>0.4664</td><td>|IIIIIIIIIIIIII</td><td>0.3150</td><td>|IIIIIIIII</td></tr>
<tr><td>99 140</td><td>2</td><td>0.6501</td><td>0.4655</td><td>|IIIIIIIIIIIIII</td><td>0.1078</td><td>|III</td></tr>
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**Fuzzy Clustering Report**

Page/Date/Time 26 4/14/2005 11:44:57 PM
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Variables StdFactor1MulSqrtEV1, StdFactor2MulSqrtEV2, StdFactor3MulSqrtEV3
Distance Type Euclidean
Scale Type None

**Membership Summary Section for Clusters = 6**

<table>
<tr><th>Row</th><th>Cluster</th><th>Cluster Membership</th><th>Sum of Squared Memberships</th><th>Bar of Squared Memberships</th><th>Silhouette Amount</th><th>Silhouette Bar</th></tr>
<tr><td>9 12</td><td>2</td><td>0.6432</td><td>0.4582</td><td>|IIIIIIIIIIIIII</td><td>0.1523</td><td>|IIIII</td></tr>
<tr><td>98 139</td><td>2</td><td>0.6350</td><td>0.4423</td><td>|IIIIIIIIIIIII</td><td>0.4819</td><td>|IIIIIIIIIIIIII</td></tr>
<tr><td>105 147</td><td>2</td><td>0.6336</td><td>0.4409</td><td>|IIIIIIIIIIIII</td><td>0.2585</td><td>|IIIIIIII</td></tr>
<tr><td>76 113</td><td>2</td><td>0.5701</td><td>0.3840</td><td>|IIIIIIIIIIII</td><td>0.2205</td><td>|IIIIIII</td></tr>
<tr><td>95 135</td><td>2</td><td>0.5549</td><td>0.3771</td><td>|IIIIIIIIIII</td><td>0.0354</td><td>|I</td></tr>
<tr><td>30 42</td><td>2</td><td>0.5451</td><td>0.3712</td><td>|IIIIIIIIIII</td><td>0.3773</td><td>|IIIIIIIIIII</td></tr>
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<tr><td>71 103</td><td>2</td><td>0.4261</td><td>0.3080</td><td>|IIIIIIIII</td><td>-0.1562</td><td>|</td></tr>
<tr><td>79 117</td><td>2</td><td>0.4172</td><td>0.3012</td><td>|IIIIIIIII</td><td>0.1992</td><td>|IIIIII</td></tr>
<tr><td>7 10</td><td>2</td><td>0.4064</td><td>0.3045</td><td>|IIIIIIIII</td><td>0.2314</td><td>|IIIIIII</td></tr>
<tr><td>55 83</td><td>2</td><td>0.3934</td><td>0.2989</td><td>|IIIIIIIII</td><td>-0.2113</td><td>|</td></tr>
<tr><td>84 124</td><td>2</td><td>0.2412</td><td>0.1901</td><td>|IIIIII</td><td>0.0651</td><td>|II</td></tr>
<tr><td>120 165</td><td>3</td><td>0.8411</td><td>0.7130</td><td>|IIIIIIIIIIIIIIIIIIIII</td><td>-0.1580</td><td>|</td></tr>
<tr><td>88 128</td><td>3</td><td>0.8108</td><td>0.6651</td><td>|IIIIIIIIIIIIIIIIIIII</td><td>-0.0243</td><td>|</td></tr>
<tr><td>73 105</td><td>3</td><td>0.7373</td><td>0.5586</td><td>|IIIIIIIIIIIIIIIII</td><td>-0.1437</td><td>|</td></tr>
<tr><td>52 77</td><td>3</td><td>0.7108</td><td>0.5238</td><td>|IIIIIIIIIIIIIIII</td><td>-0.2215</td><td>|</td></tr>
<tr><td>31 43</td><td>3</td><td>0.6506</td><td>0.4509</td><td>|IIIIIIIIIIIIII</td><td>-0.3978</td><td>|</td></tr>
<tr><td>81 120</td><td>3</td><td>0.6035</td><td>0.4011</td><td>|IIIIIIIIIIII</td><td>-0.4838</td><td>|</td></tr>
<tr><td>63 92</td><td>3</td><td>0.5625</td><td>0.3571</td><td>|IIIIIIIIIII</td><td>0.0560</td><td>|II</td></tr>
<tr><td>101 142</td><td>3</td><td>0.3680</td><td>0.2264</td><td>|IIIIIII</td><td>-0.2361</td><td>|</td></tr>
<tr><td>103 144</td><td>3</td><td>0.3605</td><td>0.2167</td><td>|IIIIIII</td><td>-0.2750</td><td>|</td></tr>
<tr><td>42 63</td><td>3</td><td>0.3505</td><td>0.2173</td><td>|IIIIIII</td><td>-0.1552</td><td>|</td></tr>
<tr><td>94 134</td><td>3</td><td>0.3368</td><td>0.2061</td><td>|IIIIII</td><td>0.0498</td><td>|I</td></tr>
<tr><td>24 36</td><td>3</td><td>0.2994</td><td>0.2106</td><td>|IIIIII</td><td>-0.4470</td><td>|</td></tr>
<tr><td>60 89</td><td>3</td><td>0.2921</td><td>0.1962</td><td>|IIIIII</td><td>-0.5059</td><td>|</td></tr>
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<tr><td>18 27</td><td>3</td><td>0.2131</td><td>0.1700</td><td>|IIIII</td><td>0.0747</td><td>|II</td></tr>
<tr><td>41 61</td><td>3</td><td>0.2122</td><td>0.1806</td><td>|IIIII</td><td>-0.2537</td><td>|</td></tr>
<tr><td>25 37</td><td>4</td><td>0.4901</td><td>0.3412</td><td>|IIIIIIIIII</td><td>0.5639</td><td>|IIIIIIIIIIIIIIIII</td></tr>
<tr><td>35 52</td><td>4</td><td>0.4852</td><td>0.3510</td><td>|IIIIIIIIIII</td><td>0.5601</td><td>|IIIIIIIIIIIIIIIII</td></tr>
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<tr><td>34 49</td><td>4</td><td>0.4466</td><td>0.3058</td><td>|IIIIIIIII</td><td>0.4749</td><td>|IIIIIIIIIIIIII</td></tr>
<tr><td>123 172</td><td>4</td><td>0.4165</td><td>0.2943</td><td>|IIIIIIIII</td><td>0.3624</td><td>|IIIIIIIIIII</td></tr>
<tr><td>14 20</td><td>4</td><td>0.4048</td><td>0.3004</td><td>|IIIIIIIII</td><td>0.4301</td><td>|IIIIIIIIIIIII</td></tr>
<tr><td>26 38</td><td>4</td><td>0.3769</td><td>0.2908</td><td>|IIIIIIIII</td><td>0.3314</td><td>|IIIIIIIIII</td></tr>
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<tr><td>5 6</td><td>5</td><td>0.9395</td><td>0.8834</td><td>|IIIIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.6402</td><td>|IIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>61 90</td><td>5</td><td>0.9344</td><td>0.8739</td><td>|IIIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.6382</td><td>|IIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>20 31</td><td>5</td><td>0.9326</td><td>0.8706</td><td>|IIIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.6303</td><td>|IIIIIIIIIIIIIIIIIII</td></tr>
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## Fuzzy Clustering Report

Page/Date/Time 27 4/14/2005 11:44:57 PM
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Distance Type Euclidean
Scale Type None

**Membership Summary Section for Clusters = 6**

<table>
<tr><th>Row</th><th>Cluster</th><th>Cluster Membership</th><th>Sum of Squared Memberships</th><th>Bar of Squared Memberships</th><th>Silhouette Amount</th><th>Silhouette Bar</th></tr>
<tr><td>17 26</td><td>5</td><td>0.9230</td><td>0.8532</td><td>|||||||||||||||||||||||||||</td><td>0.6280</td><td>||||||||||||||||||||</td></tr>
<tr><td>93 133</td><td>5</td><td>0.9180</td><td>0.8440</td><td>||||||||||||||||||||||||||</td><td>0.6499</td><td>||||||||||||||||||||</td></tr>
<tr><td>43 64</td><td>5</td><td>0.9094</td><td>0.8286</td><td>||||||||||||||||||||||||||</td><td>0.6581</td><td>|||||||||||||||||||||</td></tr>
<tr><td>111 153</td><td>5</td><td>0.9091</td><td>0.8282</td><td>||||||||||||||||||||||||||</td><td>0.6370</td><td>||||||||||||||||||||</td></tr>
<tr><td>106 148</td><td>5</td><td>0.8838</td><td>0.7840</td><td>|||||||||||||||||||||||||</td><td>0.6511</td><td>|||||||||||||||||||||</td></tr>
<tr><td>82 121</td><td>5</td><td>0.8735</td><td>0.7663</td><td>||||||||||||||||||||||||</td><td>0.6457</td><td>||||||||||||||||||||</td></tr>
<tr><td>116 159</td><td>5</td><td>0.8463</td><td>0.7211</td><td>|||||||||||||||||||||||</td><td>0.5934</td><td>|||||||||||||||||||</td></tr>
<tr><td>110 152</td><td>5</td><td>0.8460</td><td>0.7207</td><td>|||||||||||||||||||||||</td><td>0.5778</td><td>||||||||||||||||||</td></tr>
<tr><td>72 104</td><td>5</td><td>0.8204</td><td>0.6798</td><td>|||||||||||||||||||||</td><td>0.5498</td><td>|||||||||||||||||</td></tr>
<tr><td>80 118</td><td>5</td><td>0.8009</td><td>0.6497</td><td>||||||||||||||||||||</td><td>0.6013</td><td>|||||||||||||||||||</td></tr>
<tr><td>13 19</td><td>5</td><td>0.7984</td><td>0.6460</td><td>||||||||||||||||||||</td><td>0.5659</td><td>||||||||||||||||||</td></tr>
<tr><td>15 21</td><td>5</td><td>0.7969</td><td>0.6439</td><td>||||||||||||||||||||</td><td>0.5416</td><td>|||||||||||||||||</td></tr>
<tr><td>54 82</td><td>5</td><td>0.7960</td><td>0.6422</td><td>||||||||||||||||||||</td><td>0.5638</td><td>||||||||||||||||||</td></tr>
<tr><td>57 85</td><td>5</td><td>0.7684</td><td>0.6015</td><td>|||||||||||||||||||</td><td>0.6127</td><td>|||||||||||||||||||</td></tr>
<tr><td>83 122</td><td>5</td><td>0.7412</td><td>0.5637</td><td>||||||||||||||||||</td><td>0.5288</td><td>|||||||||||||||||</td></tr>
<tr><td>113 155</td><td>5</td><td>0.7364</td><td>0.5571</td><td>||||||||||||||||||</td><td>0.5758</td><td>||||||||||||||||||</td></tr>
<tr><td>97 138</td><td>5</td><td>0.7364</td><td>0.5571</td><td>||||||||||||||||||</td><td>0.5553</td><td>||||||||||||||||||</td></tr>
<tr><td>45 67</td><td>5</td><td>0.6764</td><td>0.4801</td><td>|||||||||||||||</td><td>0.5013</td><td>||||||||||||||||</td></tr>
<tr><td>87 127</td><td>5</td><td>0.6646</td><td>0.4651</td><td>|||||||||||||||</td><td>0.4768</td><td>|||||||||||||||</td></tr>
<tr><td>85 125</td><td>5</td><td>0.6513</td><td>0.4506</td><td>|||||||||||||||</td><td>0.4916</td><td>||||||||||||||||</td></tr>
<tr><td>96 136</td><td>5</td><td>0.6463</td><td>0.4430</td><td>||||||||||||||</td><td>0.5786</td><td>||||||||||||||||||</td></tr>
<tr><td>21 32</td><td>5</td><td>0.6399</td><td>0.4373</td><td>||||||||||||||</td><td>0.5008</td><td>||||||||||||||||</td></tr>
<tr><td>47 71</td><td>5</td><td>0.6320</td><td>0.4277</td><td>||||||||||||||</td><td>0.5342</td><td>|||||||||||||||||</td></tr>
<tr><td>112 154</td><td>5</td><td>0.6316</td><td>0.4286</td><td>||||||||||||||</td><td>0.5572</td><td>||||||||||||||||||</td></tr>
<tr><td>75 110</td><td>5</td><td>0.5616</td><td>0.3566</td><td>||||||||||||</td><td>0.4777</td><td>|||||||||||||||</td></tr>
<tr><td>69 101</td><td>5</td><td>0.4858</td><td>0.2932</td><td>||||||||||</td><td>0.4992</td><td>||||||||||||||||</td></tr>
<tr><td>23 35</td><td>5</td><td>0.4410</td><td>0.2636</td><td>|||||||||</td><td>0.3490</td><td>|||||||||||</td></tr>
<tr><td>114 156</td><td>5</td><td>0.3316</td><td>0.2106</td><td>|||||||</td><td>0.3357</td><td>|||||||||||</td></tr>
<tr><td>70 102</td><td>5</td><td>0.2802</td><td>0.1915</td><td>|||||||</td><td>0.2709</td><td>|||||||||</td></tr>
<tr><td>91 131</td><td>5</td><td>0.2486</td><td>0.1815</td><td>||||||</td><td>0.2322</td><td>||||||||</td></tr>
<tr><td>118 163</td><td>6</td><td>0.5528</td><td>0.3896</td><td>|||||||||||||</td><td>-0.0584</td><td>|</td></tr>
<tr><td>27 39</td><td>6</td><td>0.5462</td><td>0.3847</td><td>|||||||||||||</td><td>-0.0674</td><td>|</td></tr>
<tr><td>44 65</td><td>6</td><td>0.5449</td><td>0.4039</td><td>|||||||||||||</td><td>-0.2753</td><td>|</td></tr>
<tr><td>40 60</td><td>6</td><td>0.5146</td><td>0.3713</td><td>||||||||||||</td><td>-0.2540</td><td>|</td></tr>
<tr><td>121 168</td><td>6</td><td>0.4764</td><td>0.3348</td><td>|||||||||||</td><td>-0.1936</td><td>|</td></tr>
<tr><td>58 86</td><td>6</td><td>0.4662</td><td>0.3187</td><td>|||||||||||</td><td>-0.1732</td><td>|</td></tr>
<tr><td>3 3</td><td>6</td><td>0.4414</td><td>0.3231</td><td>|||||||||||</td><td>-0.3252</td><td>|</td></tr>
<tr><td>53 80</td><td>6</td><td>0.4414</td><td>0.3511</td><td>||||||||||||</td><td>-0.3427</td><td>|</td></tr>
<tr><td>16 22</td><td>6</td><td>0.4337</td><td>0.3580</td><td>||||||||||||</td><td>-0.4820</td><td>|</td></tr>
<tr><td>66 97</td><td>6</td><td>0.4314</td><td>0.2929</td><td>||||||||||</td><td>-0.1880</td><td>|</td></tr>
<tr><td>56 84</td><td>6</td><td>0.3682</td><td>0.2388</td><td>||||||||</td><td>0.1217</td><td>|||||</td></tr>
<tr><td>19 29</td><td>6</td><td>0.3381</td><td>0.2643</td><td>|||||||||</td><td>-0.1693</td><td>|</td></tr>
</table>

## Fuzzy Clustering Report

| | |
|---|---|
| Page/Date/Time | 28 4/14/2005 11:44:57 PM |
| Database | |
| Variables | StdFactor1MulSqrtEV1, StdFactor2MulSqrtEV2, StdFactor3MulSqrtEV3 |
| Distance Type | Euclidean |
| Scale Type | None |

**Membership Summary Section for Clusters = 6**

| Row | Cluster | Cluster Membership | Sum of Squared Memberships | Bar of Squared Memberships | Silhouette Amount | Silhouette Bar |
|---|---|---|---|---|---|---|
| 104 146 | 6 | 0.3018 | 0.2191 | \|IIIIIII | 0.0525 | \|II |
| 89 129 | 6 | 0.2903 | 0.2382 | \|IIIIIII | -0.2538 | \| |
| 62 91 | 6 | 0.2570 | 0.2131 | \|IIIIII | -0.0415 | \| |
| 90 130 | 6 | 0.2423 | 0.1941 | \|IIIIII | -0.0027 | \| |

**Membership Matrix Section**

| Row | Cluster | Prob in 1 | Prob in 2 | Prob in 3 | Prob in 4 | Prob in 5 | Prob in 6 |
|---|---|---|---|---|---|---|---|
| 1 1 | 1 | 0.6777 | 0.0708 | 0.0104 | 0.1419 | 0.0175 | 0.0817 |
| 2 2 | 1 | 0.4768 | 0.0762 | 0.0141 | 0.2600 | 0.0207 | 0.1522 |
| 3 3 | 6 | 0.0534 | 0.1256 | 0.0214 | 0.3291 | 0.0290 | 0.4414 |
| 4 4 | 2 | 0.0990 | 0.7538 | 0.0059 | 0.0801 | 0.0179 | 0.0434 |
| 5 6 | 5 | 0.0120 | 0.0130 | 0.0072 | 0.0145 | 0.9395 | 0.0137 |
| 6 7 | 1 | 0.7535 | 0.0773 | 0.0075 | 0.0916 | 0.0195 | 0.0507 |
| 7 10 | 2 | 0.3402 | 0.4064 | 0.0121 | 0.1284 | 0.0403 | 0.0726 |
| 8 11 | 1 | 0.3145 | 0.0866 | 0.0660 | 0.2426 | 0.0548 | 0.2356 |
| 9 12 | 2 | 0.0770 | 0.6432 | 0.0059 | 0.1775 | 0.0144 | 0.0819 |
| 10 13 | 1 | 0.5348 | 0.1699 | 0.0219 | 0.1265 | 0.0618 | 0.0851 |
| 11 14 | 1 | 0.7450 | 0.0576 | 0.0100 | 0.1030 | 0.0215 | 0.0629 |
| 12 15 | 4 | 0.1072 | 0.0667 | 0.0124 | 0.4717 | 0.0179 | 0.3241 |
| 13 19 | 5 | 0.0307 | 0.0386 | 0.0294 | 0.0502 | 0.7984 | 0.0527 |
| 14 20 | 4 | 0.0738 | 0.1660 | 0.0149 | 0.4048 | 0.0196 | 0.3209 |
| 15 21 | 5 | 0.0453 | 0.0502 | 0.0207 | 0.0460 | 0.7969 | 0.0410 |
| 16 22 | 6 | 0.0519 | 0.0864 | 0.0129 | 0.3992 | 0.0159 | 0.4337 |
| 17 26 | 5 | 0.0148 | 0.0155 | 0.0092 | 0.0191 | 0.9230 | 0.0184 |
| 18 27 | 3 | 0.1597 | 0.1418 | 0.2131 | 0.1665 | 0.1455 | 0.1734 |
| 19 29 | 6 | 0.1956 | 0.0667 | 0.0406 | 0.3231 | 0.0360 | 0.3381 |
| 20 31 | 5 | 0.0127 | 0.0142 | 0.0081 | 0.0165 | 0.9326 | 0.0159 |
| 21 32 | 5 | 0.0494 | 0.0531 | 0.0704 | 0.0874 | 0.6399 | 0.0997 |
| 22 34 | 2 | 0.0542 | 0.7047 | 0.0056 | 0.1475 | 0.0126 | 0.0754 |
| 23 35 | 5 | 0.1689 | 0.1158 | 0.0548 | 0.1180 | 0.4410 | 0.1016 |
| 24 36 | 3 | 0.1239 | 0.0694 | 0.2994 | 0.1862 | 0.0751 | 0.2459 |
| 25 37 | 4 | 0.0998 | 0.1000 | 0.0110 | 0.4901 | 0.0150 | 0.2841 |
| 26 38 | 4 | 0.0606 | 0.2079 | 0.0142 | 0.3769 | 0.0224 | 0.3181 |
| 27 39 | 6 | 0.0618 | 0.0520 | 0.0353 | 0.2790 | 0.0257 | 0.5462 |
| 28 40 | 2 | 0.2653 | 0.4433 | 0.0185 | 0.1311 | 0.0562 | 0.0855 |
| 29 41 | 1 | 0.4154 | 0.0789 | 0.0148 | 0.2945 | 0.0276 | 0.1688 |
| 30 42 | 2 | 0.2368 | 0.5451 | 0.0100 | 0.1132 | 0.0306 | 0.0644 |
| 31 43 | 3 | 0.0398 | 0.0427 | 0.6506 | 0.0717 | 0.1026 | 0.0927 |
| 32 46 | 2 | 0.0613 | 0.6569 | 0.0127 | 0.1405 | 0.0256 | 0.1029 |
| 33 47 | 1 | 0.6611 | 0.1230 | 0.0132 | 0.1058 | 0.0308 | 0.0662 |
| 34 49 | 4 | 0.2006 | 0.0768 | 0.0127 | 0.4466 | 0.0190 | 0.2443 |
| 35 52 | 4 | 0.0671 | 0.1087 | 0.0100 | 0.4852 | 0.0145 | 0.3146 |

## Fuzzy Clustering Report

Page/Date/Time 29 4/14/2005 11:44:57 PM
Database
Variables StdFactor1MulSqrtEV1, StdFactor2MulSqrtEV2, StdFactor3MulSqrtEV3
Distance Type Euclidean
Scale Type None

**Membership Matrix Section**

| Row | Cluster | Prob in 1 | Prob in 2 | Prob in 3 | Prob in 4 | Prob in 5 | Prob in 6 |
|---|---|---|---|---|---|---|---|
| 36 54 | 2 | 0.0521 | 0.7755 | 0.0086 | 0.0849 | 0.0201 | 0.0588 |
| 37 55 | 2 | 0.0458 | 0.8471 | 0.0042 | 0.0563 | 0.0133 | 0.0332 |
| 38 56 | 1 | 0.4519 | 0.1703 | 0.0356 | 0.1444 | 0.0902 | 0.1076 |
| 39 58 | 2 | 0.0473 | 0.7861 | 0.0079 | 0.0832 | 0.0181 | 0.0574 |
| 40 60 | 6 | 0.0485 | 0.0838 | 0.0212 | 0.3101 | 0.0218 | 0.5146 |
| 41 61 | 3 | 0.1819 | 0.1069 | 0.2122 | 0.1932 | 0.0940 | 0.2118 |
| 42 63 | 3 | 0.1226 | 0.0842 | 0.3505 | 0.1637 | 0.0818 | 0.1971 |
| 43 64 | 5 | 0.0152 | 0.0158 | 0.0159 | 0.0215 | 0.9094 | 0.0223 |
| 44 65 | 6 | 0.0482 | 0.0515 | 0.0179 | 0.3182 | 0.0192 | 0.5449 |
| 45 67 | 5 | 0.0833 | 0.0755 | 0.0319 | 0.0708 | 0.6764 | 0.0621 |
| 46 68 | 1 | 0.5492 | 0.0918 | 0.0092 | 0.2243 | 0.0175 | 0.1080 |
| 47 71 | 5 | 0.0864 | 0.0566 | 0.0521 | 0.0881 | 0.6320 | 0.0849 |
| 48 72 | 1 | 0.5337 | 0.1417 | 0.0284 | 0.1327 | 0.0675 | 0.0960 |
| 49 73 | 2 | 0.0502 | 0.8096 | 0.0071 | 0.0681 | 0.0190 | 0.0460 |
| 50 74 | 3 | 0.1110 | 0.1392 | 0.2647 | 0.1586 | 0.1493 | 0.1772 |
| 51 75 | 4 | 0.1599 | 0.1420 | 0.0105 | 0.4587 | 0.0165 | 0.2124 |
| 52 77 | 3 | 0.0430 | 0.0322 | 0.7108 | 0.0675 | 0.0600 | 0.0865 |
| 53 80 | 6 | 0.0840 | 0.0547 | 0.0194 | 0.3815 | 0.0190 | 0.4414 |
| 54 82 | 5 | 0.0327 | 0.0445 | 0.0309 | 0.0475 | 0.7960 | 0.0483 |
| 55 83 | 2 | 0.0699 | 0.3934 | 0.0095 | 0.3238 | 0.0192 | 0.1842 |
| 56 84 | 6 | 0.0761 | 0.0762 | 0.2009 | 0.2183 | 0.0604 | 0.3682 |
| 57 85 | 5 | 0.0394 | 0.0336 | 0.0502 | 0.0526 | 0.7684 | 0.0557 |
| 58 86 | 6 | 0.0560 | 0.1053 | 0.0358 | 0.2891 | 0.0476 | 0.4662 |
| 59 87 | 1 | 0.4697 | 0.2181 | 0.0235 | 0.1311 | 0.0668 | 0.0907 |
| 60 89 | 3 | 0.0741 | 0.1057 | 0.2921 | 0.1480 | 0.1947 | 0.1854 |
| 61 90 | 5 | 0.0132 | 0.0144 | 0.0079 | 0.0155 | 0.9344 | 0.0147 |
| 62 91 | 6 | 0.2549 | 0.0886 | 0.0895 | 0.2502 | 0.0599 | 0.2570 |
| 63 92 | 3 | 0.0758 | 0.0584 | 0.5625 | 0.1018 | 0.0804 | 0.1210 |
| 64 93 | 1 | 0.5381 | 0.2015 | 0.0169 | 0.1171 | 0.0499 | 0.0765 |
| 65 95 | 2 | 0.0533 | 0.8359 | 0.0049 | 0.0573 | 0.0131 | 0.0356 |
| 66 97 | 6 | 0.0618 | 0.1147 | 0.0393 | 0.2905 | 0.0622 | 0.4314 |
| 67 98 | 2 | 0.0458 | 0.7232 | 0.0073 | 0.1246 | 0.0166 | 0.0824 |
| 68 99 | 1 | 0.5303 | 0.1553 | 0.0092 | 0.1923 | 0.0182 | 0.0947 |
| 69 101 | 5 | 0.0833 | 0.0612 | 0.1484 | 0.1061 | 0.4858 | 0.1152 |
| 70 102 | 5 | 0.0775 | 0.1169 | 0.1997 | 0.1486 | 0.2802 | 0.1771 |
| 71 103 | 2 | 0.0795 | 0.4261 | 0.0086 | 0.3068 | 0.0189 | 0.1602 |
| 72 104 | 5 | 0.0376 | 0.0447 | 0.0191 | 0.0408 | 0.8204 | 0.0374 |
| 73 105 | 3 | 0.0337 | 0.0356 | 0.7373 | 0.0592 | 0.0589 | 0.0753 |
| 74 107 | 1 | 0.5828 | 0.1723 | 0.0093 | 0.1341 | 0.0290 | 0.0724 |
| 75 110 | 5 | 0.0654 | 0.0559 | 0.0938 | 0.1053 | 0.5616 | 0.1180 |
| 76 113 | 2 | 0.1609 | 0.5701 | 0.0071 | 0.1624 | 0.0197 | 0.0799 |
| 77 114 | 2 | 0.0870 | 0.5301 | 0.0259 | 0.1644 | 0.0533 | 0.1393 |
| 78 115 | 1 | 0.5949 | 0.1251 | 0.0109 | 0.1503 | 0.0344 | 0.0844 |
| 79 117 | 2 | 0.3048 | 0.4172 | 0.0084 | 0.1639 | 0.0235 | 0.0822 |

**Fuzzy Clustering Report**

Page/Date/Time 30 4/14/2005 11:44:57 PM
Database
Variables StdFactor1MulSqrtEV1, StdFactor2MulSqrtEV2, StdFactor3MulSqrtEV3
Distance Type Euclidean
Scale Type None

**Membership Matrix Section**

| Row | Cluster | Prob in 1 | Prob in 2 | Prob in 3 | Prob in 4 | Prob in 5 | Prob in 6 |
|---|---|---|---|---|---|---|---|
| 80 118 | 5 | 0.0290 | 0.0336 | 0.0396 | 0.0465 | 0.8009 | 0.0505 |
| 81 120 | 3 | 0.0439 | 0.0420 | 0.6035 | 0.0806 | 0.1265 | 0.1035 |
| 82 121 | 5 | 0.0225 | 0.0205 | 0.0224 | 0.0301 | 0.8735 | 0.0309 |
| 83 122 | 5 | 0.0647 | 0.0608 | 0.0252 | 0.0573 | 0.7412 | 0.0508 |
| 84 124 | 2 | 0.1107 | 0.2412 | 0.0959 | 0.2134 | 0.1082 | 0.2306 |
| 85 125 | 5 | 0.0937 | 0.0794 | 0.0332 | 0.0759 | 0.6513 | 0.0665 |
| 86 126 | 2 | 0.0416 | 0.8054 | 0.0069 | 0.0757 | 0.0169 | 0.0536 |
| 87 127 | 5 | 0.0515 | 0.0777 | 0.0484 | 0.0780 | 0.6646 | 0.0798 |
| 88 128 | 3 | 0.0269 | 0.0248 | 0.8108 | 0.0425 | 0.0425 | 0.0525 |
| 89 129 | 6 | 0.0847 | 0.2666 | 0.0403 | 0.2673 | 0.0508 | 0.2903 |
| 90 130 | 6 | 0.2233 | 0.0945 | 0.1356 | 0.2294 | 0.0748 | 0.2423 |
| 91 131 | 5 | 0.1649 | 0.0832 | 0.1401 | 0.1789 | 0.2486 | 0.1843 |
| 92 132 | 2 | 0.2837 | 0.4593 | 0.0147 | 0.1191 | 0.0464 | 0.0769 |
| 93 133 | 5 | 0.0145 | 0.0167 | 0.0126 | 0.0191 | 0.9180 | 0.0191 |
| 94 134 | 3 | 0.1259 | 0.1002 | 0.3368 | 0.1578 | 0.1017 | 0.1777 |
| 95 135 | 2 | 0.0912 | 0.5549 | 0.0070 | 0.2202 | 0.0169 | 0.1097 |
| 96 136 | 5 | 0.0775 | 0.0571 | 0.0653 | 0.0777 | 0.6463 | 0.0760 |
| 97 138 | 5 | 0.0647 | 0.0477 | 0.0274 | 0.0647 | 0.7364 | 0.0591 |
| 98 139 | 2 | 0.1551 | 0.6350 | 0.0115 | 0.0975 | 0.0370 | 0.0640 |
| 99 140 | 2 | 0.0621 | 0.6501 | 0.0063 | 0.1729 | 0.0140 | 0.0948 |
| 100 141 | 1 | 0.2949 | 0.0879 | 0.0628 | 0.2611 | 0.0511 | 0.2423 |
| 101 142 | 3 | 0.1183 | 0.0746 | 0.3680 | 0.1640 | 0.0797 | 0.1953 |
| 102 143 | 1 | 0.6228 | 0.0874 | 0.0219 | 0.1346 | 0.0375 | 0.0956 |
| 103 144 | 3 | 0.0803 | 0.1063 | 0.3605 | 0.1413 | 0.1408 | 0.1708 |
| 104 146 | 6 | 0.1863 | 0.0765 | 0.1071 | 0.2693 | 0.0590 | 0.3018 |
| 105 147 | 2 | 0.0744 | 0.6336 | 0.0095 | 0.1517 | 0.0314 | 0.0994 |
| 106 148 | 5 | 0.0187 | 0.0195 | 0.0223 | 0.0271 | 0.8838 | 0.0286 |
| 107 149 | 2 | 0.0415 | 0.8006 | 0.0044 | 0.0894 | 0.0109 | 0.0532 |
| 108 150 | 2 | 0.0924 | 0.7101 | 0.0117 | 0.0892 | 0.0328 | 0.0638 |
| 109 151 | 2 | 0.0527 | 0.8463 | 0.0042 | 0.0519 | 0.0127 | 0.0323 |
| 110 152 | 5 | 0.0352 | 0.0362 | 0.0158 | 0.0350 | 0.8460 | 0.0318 |
| 111 153 | 5 | 0.0196 | 0.0196 | 0.0110 | 0.0210 | 0.9091 | 0.0197 |
| 112 154 | 5 | 0.0500 | 0.0470 | 0.1066 | 0.0776 | 0.6316 | 0.0872 |
| 113 155 | 5 | 0.0674 | 0.0487 | 0.0298 | 0.0615 | 0.7364 | 0.0561 |
| 114 156 | 5 | 0.0688 | 0.0943 | 0.1992 | 0.1376 | 0.3316 | 0.1685 |
| 115 158 | 1 | 0.6628 | 0.0620 | 0.0108 | 0.1549 | 0.0190 | 0.0905 |
| 116 159 | 5 | 0.0256 | 0.0332 | 0.0228 | 0.0357 | 0.8463 | 0.0363 |
| 117 161 | 1 | 0.3895 | 0.1035 | 0.0635 | 0.1994 | 0.0741 | 0.1699 |
| 118 163 | 6 | 0.0503 | 0.0625 | 0.0336 | 0.2753 | 0.0255 | 0.5528 |
| 119 164 | 1 | 0.4020 | 0.2354 | 0.0091 | 0.2258 | 0.0193 | 0.1084 |
| 120 165 | 3 | 0.0215 | 0.0196 | 0.8411 | 0.0350 | 0.0394 | 0.0432 |
| 121 168 | 6 | 0.0580 | 0.1041 | 0.0302 | 0.3032 | 0.0280 | 0.4764 |
| 122 171 | 4 | 0.0627 | 0.2631 | 0.0186 | 0.3121 | 0.0327 | 0.3108 |
| 123 172 | 4 | 0.1853 | 0.0689 | 0.0182 | 0.4165 | 0.0271 | 0.2840 |

## Fuzzy Clustering Report

| | |
|---|---|
| Page/Date/Time | 31    4/14/2005 11:44:58 PM |
| Database | |
| Variables | StdFactor1MulSqrtEV1, StdFactor2MulSqrtEV2, StdFactor3MulSqrtEV3 |
| Distance Type | Euclidean |
| Scale Type | None |

**Cluster Medoids Section**

| Variable | Cluster1 | Cluster2 | Cluster3 | Cluster4 | Cluster5 | Cluster6 |
|---|---|---|---|---|---|---|
| StdFactor1MulSqrtEV1 | 0.9063011 | -2.392174 | 0.3849433 | -0.2682966 | -0.3967205 | 1.048896 |
| StdFactor2MulSqrtEV2 | 1.150979 | -0.5648198 | 0.6269889 | 0.5796099 | 0.2817987 | -0.6438655 |
| StdFactor3MulSqrtEV3 | 0.4075354 | 1.007912 | -0.5029526 | 6.064208E-02 | -0.7347661 | 0.1370008 |
| Row | 101 142 | 107 149 | 34 49 | 40 60 | 61 90 | 64 93 |

**Cluster Medoids Section**

| Variable | Cluster7 |
|---|---|
| StdFactor1MulSqrtEV1 | -0.3352886 |
| StdFactor2MulSqrtEV2 | -1.566871 |
| StdFactor3MulSqrtEV3 | -0.1434564 |
| Row | 81 120 |

**Membership Summary Section for Clusters = 7**

| Row | Cluster | Cluster Membership | Sum of Squared Memberships | Bar of Squared Memberships | Silhouette Amount | Silhouette Bar |
|---|---|---|---|---|---|---|
| 101 142 | 1 | 0.8863 | 0.7879 | \|IIIIIIIIIIIIIIIIIIIIIIII | -0.2017 | \| |
| 42 63 | 1 | 0.8661 | 0.7533 | \|IIIIIIIIIIIIIIIIIIIIIII | -0.0348 | \| |
| 63 92 | 1 | 0.6162 | 0.4077 | \|IIIIIIIIIIII | -0.1699 | \| |
| 41 61 | 1 | 0.6016 | 0.3910 | \|IIIIIIIIIIII | -0.1760 | \| |
| 94 134 | 1 | 0.5942 | 0.3816 | \|IIIIIIIIIII | 0.1956 | \|IIIIII |
| 24 36 | 1 | 0.5602 | 0.3520 | \|IIIIIIIIIII | -0.5080 | \| |
| 90 130 | 1 | 0.3540 | 0.2205 | \|IIIIIII | -0.5972 | \| |
| 18 27 | 1 | 0.2309 | 0.1524 | \|IIIII | 0.1703 | \|IIIII |
| 107 149 | 2 | 0.8631 | 0.7502 | \|IIIIIIIIIIIIIIIIIIIIIII | 0.6171 | \|IIIIIIIIIIIIIIIIIII |
| 86 126 | 2 | 0.8410 | 0.7138 | \|IIIIIIIIIIIIIIIIIIIII | 0.6259 | \|IIIIIIIIIIIIIIIIIII |
| 37 55 | 2 | 0.8389 | 0.7107 | \|IIIIIIIIIIIIIIIIIIIII | 0.5860 | \|IIIIIIIIIIIIIIIIII |
| 39 58 | 2 | 0.8197 | 0.6801 | \|IIIIIIIIIIIIIIIIIIII | 0.6181 | \|IIIIIIIIIIIIIIIIIII |
| 65 95 | 2 | 0.8169 | 0.6768 | \|IIIIIIIIIIIIIIIIIIII | 0.5649 | \|IIIIIIIIIIIIIIIII |
| 109 151 | 2 | 0.8157 | 0.6756 | \|IIIIIIIIIIIIIIIIIIII | 0.5480 | \|IIIIIIIIIIIIIIII |
| 49 73 | 2 | 0.8144 | 0.6717 | \|IIIIIIIIIIIIIIIIIIII | 0.6190 | \|IIIIIIIIIIIIIIIIIII |
| 36 54 | 2 | 0.8015 | 0.6521 | \|IIIIIIIIIIIIIIIIIIII | 0.6172 | \|IIIIIIIIIIIIIIIIIII |
| 67 98 | 2 | 0.7907 | 0.6395 | \|IIIIIIIIIIIIIIIIIII | 0.5432 | \|IIIIIIIIIIIIIIII |
| 22 34 | 2 | 0.7883 | 0.6350 | \|IIIIIIIIIIIIIIIIIII | 0.5636 | \|IIIIIIIIIIIIIIIII |
| 99 140 | 2 | 0.7438 | 0.5743 | \|IIIIIIIIIIIIIIIII | 0.5256 | \|IIIIIIIIIIIIIIII |
| 9 12 | 2 | 0.7203 | 0.5408 | \|IIIIIIIIIIIIIIII | 0.5505 | \|IIIIIIIIIIIIIIIII |
| 32 46 | 2 | 0.7023 | 0.5191 | \|IIIIIIIIIIIIIIII | 0.4951 | \|IIIIIIIIIIIIIII |
| 105 147 | 2 | 0.6817 | 0.4905 | \|IIIIIIIIIIIIIII | 0.5202 | \|IIIIIIIIIIIIIIII |
| 4 4 | 2 | 0.6725 | 0.4917 | \|IIIIIIIIIIIIIII | 0.3840 | \|IIIIIIIIIIII |
| 108 150 | 2 | 0.6620 | 0.4688 | \|IIIIIIIIIIIIII | 0.4796 | \|IIIIIIIIIIIIII |
| 95 135 | 2 | 0.6443 | 0.4518 | \|IIIIIIIIIIIIII | 0.4953 | \|IIIIIIIIIIIIIII |
| 76 113 | 2 | 0.5658 | 0.3779 | \|IIIIIIIIIII | 0.3699 | \|IIIIIIIIIII |
| 77 114 | 2 | 0.5439 | 0.3462 | \|IIIIIIIIII | 0.3984 | \|IIIIIIIIIIII |
| 71 103 | 2 | 0.5178 | 0.3540 | \|IIIIIIIIIII | 0.3715 | \|IIIIIIIIIII |

## Fuzzy Clustering Report

Page/Date/Time 32 4/14/2005 11:44:58 PM
Database
Variables StdFactor1MulSqrtEV1, StdFactor2MulSqrtEV2, StdFactor3MulSqrtEV3
Distance Type Euclidean
Scale Type None

**Membership Summary Section for Clusters = 7**

<table>
<tr><th>Row</th><th>Cluster</th><th>Cluster Membership</th><th>Sum of Squared Memberships</th><th>Bar of Squared Memberships</th><th>Silhouette Amount</th><th>Silhouette Bar</th></tr>
<tr><td>98 139</td><td>2</td><td>0.4966</td><td>0.3478</td><td>|||||||||||</td><td>0.2287</td><td>||||||||</td></tr>
<tr><td>55 83</td><td>2</td><td>0.4560</td><td>0.3424</td><td>|||||||||||</td><td>0.2921</td><td>||||||||||</td></tr>
<tr><td>34 49</td><td>3</td><td>0.7205</td><td>0.5417</td><td>|||||||||||||||||</td><td>0.2796</td><td>|||||||||</td></tr>
<tr><td>2 2</td><td>3</td><td>0.7177</td><td>0.5389</td><td>|||||||||||||||||</td><td>0.3510</td><td>||||||||||||</td></tr>
<tr><td>29 41</td><td>3</td><td>0.7125</td><td>0.5305</td><td>|||||||||||||||||</td><td>0.2908</td><td>||||||||||</td></tr>
<tr><td>123 172</td><td>3</td><td>0.7087</td><td>0.5250</td><td>|||||||||||||||||</td><td>0.3081</td><td>||||||||||</td></tr>
<tr><td>115 158</td><td>3</td><td>0.6156</td><td>0.4365</td><td>||||||||||||||</td><td>0.1585</td><td>||||||</td></tr>
<tr><td>19 29</td><td>3</td><td>0.6152</td><td>0.4118</td><td>|||||||||||||</td><td>0.4036</td><td>|||||||||||||</td></tr>
<tr><td>46 68</td><td>3</td><td>0.5924</td><td>0.4103</td><td>|||||||||||||</td><td>0.0764</td><td>|||</td></tr>
<tr><td>12 15</td><td>3</td><td>0.5200</td><td>0.3619</td><td>||||||||||||</td><td>0.0146</td><td>|</td></tr>
<tr><td>100 141</td><td>3</td><td>0.4860</td><td>0.2871</td><td>||||||||||</td><td>0.4738</td><td>|||||||||||||||</td></tr>
<tr><td>8 11</td><td>3</td><td>0.4563</td><td>0.2654</td><td>|||||||||</td><td>0.4635</td><td>|||||||||||||||</td></tr>
<tr><td>1 1</td><td>3</td><td>0.4551</td><td>0.3442</td><td>|||||||||||</td><td>0.0280</td><td>||</td></tr>
<tr><td>53 80</td><td>3</td><td>0.4235</td><td>0.3294</td><td>|||||||||||</td><td>-0.0523</td><td>|</td></tr>
<tr><td>51 75</td><td>3</td><td>0.4126</td><td>0.2784</td><td>|||||||||</td><td>-0.1065</td><td>|</td></tr>
<tr><td>62 91</td><td>3</td><td>0.3891</td><td>0.2257</td><td>||||||||</td><td>0.4585</td><td>|||||||||||||||</td></tr>
<tr><td>104 146</td><td>3</td><td>0.3879</td><td>0.2261</td><td>||||||||</td><td>0.3836</td><td>|||||||||||||</td></tr>
<tr><td>117 161</td><td>3</td><td>0.3423</td><td>0.2112</td><td>|||||||</td><td>0.1873</td><td>|||||||</td></tr>
<tr><td>40 60</td><td>4</td><td>0.8493</td><td>0.7268</td><td>|||||||||||||||||||||||</td><td>0.4853</td><td>||||||||||||||||</td></tr>
<tr><td>16 22</td><td>4</td><td>0.8253</td><td>0.6899</td><td>||||||||||||||||||||||</td><td>0.3807</td><td>||||||||||||</td></tr>
<tr><td>3 3</td><td>4</td><td>0.8187</td><td>0.6786</td><td>|||||||||||||||||||||</td><td>0.3812</td><td>||||||||||||</td></tr>
<tr><td>121 168</td><td>4</td><td>0.7641</td><td>0.5967</td><td>|||||||||||||||||||</td><td>0.4620</td><td>|||||||||||||||</td></tr>
<tr><td>118 163</td><td>4</td><td>0.7169</td><td>0.5326</td><td>|||||||||||||||||</td><td>0.4922</td><td>||||||||||||||||</td></tr>
<tr><td>26 38</td><td>4</td><td>0.7139</td><td>0.5381</td><td>|||||||||||||||||</td><td>0.1235</td><td>|||||</td></tr>
<tr><td>44 65</td><td>4</td><td>0.7000</td><td>0.5172</td><td>|||||||||||||||||</td><td>0.3792</td><td>||||||||||||</td></tr>
<tr><td>58 86</td><td>4</td><td>0.6889</td><td>0.4950</td><td>||||||||||||||||</td><td>0.3873</td><td>|||||||||||||</td></tr>
<tr><td>14 20</td><td>4</td><td>0.6569</td><td>0.4669</td><td>|||||||||||||||</td><td>0.1822</td><td>||||||</td></tr>
<tr><td>35 52</td><td>4</td><td>0.6411</td><td>0.4521</td><td>|||||||||||||||</td><td>0.1687</td><td>||||||</td></tr>
<tr><td>122 171</td><td>4</td><td>0.6172</td><td>0.4359</td><td>||||||||||||||</td><td>0.0459</td><td>||</td></tr>
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<tr><td>27 39</td><td>4</td><td>0.5335</td><td>0.3483</td><td>|||||||||||</td><td>0.2629</td><td>|||||||||</td></tr>
<tr><td>89 129</td><td>4</td><td>0.4547</td><td>0.2917</td><td>||||||||||</td><td>0.1043</td><td>||||</td></tr>
<tr><td>25 37</td><td>4</td><td>0.4243</td><td>0.3096</td><td>||||||||||</td><td>0.1140</td><td>||||</td></tr>
<tr><td>56 84</td><td>4</td><td>0.3373</td><td>0.1997</td><td>|||||||</td><td>0.3056</td><td>||||||||||</td></tr>
<tr><td>84 124</td><td>4</td><td>0.2616</td><td>0.1795</td><td>||||||</td><td>0.0118</td><td>|</td></tr>
<tr><td>61 90</td><td>5</td><td>0.9355</td><td>0.8763</td><td>|||||||||||||||||||||||||||</td><td>0.7136</td><td>||||||||||||||||||||||</td></tr>
<tr><td>5 6</td><td>5</td><td>0.9340</td><td>0.8736</td><td>|||||||||||||||||||||||||||</td><td>0.7120</td><td>||||||||||||||||||||||</td></tr>
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<tr><td>20 31</td><td>5</td><td>0.8975</td><td>0.8088</td><td>|||||||||||||||||||||||||</td><td>0.6888</td><td>||||||||||||||||||||||</td></tr>
<tr><td>110 152</td><td>5</td><td>0.8773</td><td>0.7728</td><td>||||||||||||||||||||||||</td><td>0.6719</td><td>|||||||||||||||||||||</td></tr>
<tr><td>17 26</td><td>5</td><td>0.8761</td><td>0.7724</td><td>||||||||||||||||||||||||</td><td>0.6808</td><td>|||||||||||||||||||||</td></tr>
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**Fuzzy Clustering Report**

Page/Date/Time 33 4/14/2005 11:44:58 PM
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Distance Type Euclidean
Scale Type None

**Membership Summary Section for Clusters = 7**

<table>
<tr><th>Row</th><th>Cluster</th><th>Cluster Membership</th><th>Sum of Squared Memberships</th><th>Bar of Squared Memberships</th><th>Silhouette Amount</th><th>Silhouette Bar</th></tr>
<tr><td>72 104</td><td>5</td><td>0.8366</td><td>0.7058</td><td>||||||||||||||||||||||</td><td>0.6394</td><td>||||||||||||||||||||</td></tr>
<tr><td>15 21</td><td>5</td><td>0.8290</td><td>0.6936</td><td>||||||||||||||||||||||</td><td>0.6380</td><td>||||||||||||||||||||</td></tr>
<tr><td>83 122</td><td>5</td><td>0.7792</td><td>0.6169</td><td>||||||||||||||||||||</td><td>0.6254</td><td>||||||||||||||||||||</td></tr>
<tr><td>116 159</td><td>5</td><td>0.7450</td><td>0.5771</td><td>||||||||||||||||||</td><td>0.6365</td><td>||||||||||||||||||||</td></tr>
<tr><td>113 155</td><td>5</td><td>0.7265</td><td>0.5435</td><td>|||||||||||||||||</td><td>0.6182</td><td>||||||||||||||||||||</td></tr>
<tr><td>43 64</td><td>5</td><td>0.7237</td><td>0.5619</td><td>||||||||||||||||||</td><td>0.6612</td><td>|||||||||||||||||||||</td></tr>
<tr><td>45 67</td><td>5</td><td>0.7101</td><td>0.5211</td><td>|||||||||||||||||</td><td>0.5849</td><td>|||||||||||||||||||</td></tr>
<tr><td>97 138</td><td>5</td><td>0.7066</td><td>0.5179</td><td>|||||||||||||||||</td><td>0.6053</td><td>|||||||||||||||||||</td></tr>
<tr><td>82 121</td><td>5</td><td>0.7035</td><td>0.5330</td><td>|||||||||||||||||</td><td>0.6443</td><td>||||||||||||||||||||</td></tr>
<tr><td>85 125</td><td>5</td><td>0.6825</td><td>0.4858</td><td>||||||||||||||||</td><td>0.5628</td><td>||||||||||||||||||</td></tr>
<tr><td>106 148</td><td>5</td><td>0.6737</td><td>0.5074</td><td>||||||||||||||||</td><td>0.6261</td><td>||||||||||||||||||||</td></tr>
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<tr><td>80 118</td><td>5</td><td>0.4779</td><td>0.3858</td><td>|||||||||||||</td><td>0.5472</td><td>|||||||||||||||||</td></tr>
<tr><td>23 35</td><td>5</td><td>0.4407</td><td>0.2566</td><td>|||||||||</td><td>0.3694</td><td>||||||||||||</td></tr>
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<tr><td>10 13</td><td>6</td><td>0.7220</td><td>0.5391</td><td>|||||||||||||||||</td><td>0.4909</td><td>||||||||||||||||</td></tr>
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<tr><td>74 107</td><td>6</td><td>0.6315</td><td>0.4392</td><td>||||||||||||||</td><td>0.2369</td><td>||||||||</td></tr>
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<tr><td>7 10</td><td>6</td><td>0.6025</td><td>0.4208</td><td>||||||||||||||</td><td>0.1513</td><td>||||||</td></tr>
<tr><td>38 56</td><td>6</td><td>0.5517</td><td>0.3461</td><td>|||||||||||</td><td>0.4283</td><td>||||||||||||||</td></tr>
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<tr><td>30 42</td><td>6</td><td>0.4619</td><td>0.3505</td><td>||||||||||||</td><td>-0.0837</td><td>|</td></tr>
<tr><td>102 143</td><td>6</td><td>0.4603</td><td>0.3108</td><td>||||||||||</td><td>0.0994</td><td>||||</td></tr>
<tr><td>68 99</td><td>6</td><td>0.3864</td><td>0.2902</td><td>||||||||||</td><td>0.0977</td><td>||||</td></tr>
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<tr><td>81 120</td><td>7</td><td>0.7007</td><td>0.5081</td><td>||||||||||||||||</td><td>0.2035</td><td>|||||||</td></tr>
<tr><td>114 156</td><td>7</td><td>0.6762</td><td>0.4825</td><td>|||||||||||||||</td><td>-0.1088</td><td>|</td></tr>
<tr><td>31 43</td><td>7</td><td>0.6531</td><td>0.4489</td><td>||||||||||||||</td><td>0.3065</td><td>||||||||||</td></tr>
<tr><td>21 32</td><td>7</td><td>0.5613</td><td>0.3973</td><td>|||||||||||||</td><td>-0.4830</td><td>|</td></tr>
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## Fuzzy Clustering Report

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|---|---|
| Page/Date/Time | 34 4/14/2005 11:44:58 PM |
| Database | |
| Variables | StdFactor1MulSqrtEV1, StdFactor2MulSqrtEV2, StdFactor3MulSqrtEV3 |
| Distance Type | Euclidean |
| Scale Type | None |

**Membership Summary Section for Clusters = 7**

<table>
<tr><th>Row</th><th>Cluster</th><th>Cluster Membership</th><th>Sum of Squared Memberships</th><th>Bar of Squared Memberships</th><th>Silhouette Amount</th><th>Silhouette Bar</th></tr>
<tr><td>70 102</td><td>7</td><td>0.5493</td><td>0.3456</td><td>|||||||||||</td><td>-0.0515</td><td>|</td></tr>
<tr><td>60 89</td><td>7</td><td>0.5476</td><td>0.3403</td><td>|||||||||||</td><td>0.1448</td><td>|||||</td></tr>
<tr><td>75 110</td><td>7</td><td>0.4939</td><td>0.3388</td><td>|||||||||||</td><td>-0.4493</td><td>|</td></tr>
<tr><td>120 165</td><td>7</td><td>0.4665</td><td>0.2730</td><td>|||||||||</td><td>0.3327</td><td>|||||||||||</td></tr>
<tr><td>73 105</td><td>7</td><td>0.4620</td><td>0.2655</td><td>|||||||||</td><td>0.3284</td><td>|||||||||||</td></tr>
<tr><td>69 101</td><td>7</td><td>0.4142</td><td>0.2845</td><td>||||||||||</td><td>-0.4042</td><td>|</td></tr>
<tr><td>103 144</td><td>7</td><td>0.3923</td><td>0.2203</td><td>||||||||</td><td>0.1771</td><td>||||||</td></tr>
<tr><td>88 128</td><td>7</td><td>0.3699</td><td>0.2208</td><td>||||||||</td><td>0.3365</td><td>|||||||||||</td></tr>
<tr><td>52 77</td><td>7</td><td>0.3029</td><td>0.2127</td><td>|||||||</td><td>0.2096</td><td>|||||||</td></tr>
<tr><td>50 74</td><td>7</td><td>0.2398</td><td>0.1564</td><td>||||||</td><td>0.0897</td><td>||||</td></tr>
<tr><td>91 131</td><td>7</td><td>0.2335</td><td>0.1695</td><td>||||||</td><td>-0.3454</td><td>|</td></tr>
</table>

**Membership Matrix Section**

| Row | Cluster | Prob in 1 | Prob in 2 | Prob in 3 | Prob in 4 | Prob in 5 | Prob in 6 |
|---|---|---|---|---|---|---|---|
| 1 1 | 3 | 0.0118 | 0.0737 | 0.4551 | 0.0649 | 0.0202 | 0.3558 |
| 2 2 | 3 | 0.0096 | 0.0489 | 0.7177 | 0.0666 | 0.0140 | 0.1286 |
| 3 3 | 4 | 0.0055 | 0.0681 | 0.0487 | 0.8187 | 0.0139 | 0.0223 |
| 4 4 | 2 | 0.0042 | 0.6725 | 0.0581 | 0.0496 | 0.0199 | 0.1817 |
| 5 6 | 5 | 0.0019 | 0.0086 | 0.0077 | 0.0078 | 0.9340 | 0.0086 |
| 6 7 | 6 | 0.0059 | 0.0623 | 0.1533 | 0.0347 | 0.0187 | 0.7118 |
| 7 10 | 6 | 0.0059 | 0.2195 | 0.0801 | 0.0452 | 0.0290 | 0.6025 |
| 8 11 | 3 | 0.1083 | 0.0706 | 0.4563 | 0.1113 | 0.0461 | 0.1510 |
| 9 12 | 2 | 0.0035 | 0.7203 | 0.0727 | 0.1040 | 0.0135 | 0.0737 |
| 10 13 | 6 | 0.0104 | 0.0824 | 0.0866 | 0.0389 | 0.0371 | 0.7220 |
| 11 14 | 6 | 0.0118 | 0.0651 | 0.3322 | 0.0527 | 0.0276 | 0.4887 |
| 12 15 | 3 | 0.0102 | 0.0743 | 0.5200 | 0.2833 | 0.0194 | 0.0679 |
| 13 19 | 5 | 0.0088 | 0.0370 | 0.0331 | 0.0442 | 0.5532 | 0.0290 |
| 14 20 | 4 | 0.0081 | 0.1438 | 0.1084 | 0.6569 | 0.0153 | 0.0471 |
| 15 21 | 5 | 0.0058 | 0.0304 | 0.0234 | 0.0224 | 0.8290 | 0.0326 |
| 16 22 | 4 | 0.0049 | 0.0540 | 0.0706 | 0.8253 | 0.0091 | 0.0226 |
| 17 26 | 5 | 0.0033 | 0.0144 | 0.0140 | 0.0144 | 0.8761 | 0.0142 |
| 18 27 | 1 | 0.2309 | 0.1164 | 0.1391 | 0.1308 | 0.1193 | 0.1245 |
| 19 29 | 3 | 0.0383 | 0.0537 | 0.6152 | 0.1398 | 0.0288 | 0.0833 |
| 20 31 | 5 | 0.0027 | 0.0124 | 0.0111 | 0.0120 | 0.8975 | 0.0116 |
| 21 32 | 7 | 0.0118 | 0.0333 | 0.0387 | 0.0508 | 0.2759 | 0.0282 |
| 22 34 | 2 | 0.0029 | 0.7883 | 0.0472 | 0.0955 | 0.0104 | 0.0459 |
| 23 35 | 5 | 0.0270 | 0.0894 | 0.0974 | 0.0671 | 0.4407 | 0.1600 |
| 24 36 | 1 | 0.5602 | 0.0413 | 0.1296 | 0.0863 | 0.0430 | 0.0521 |
| 25 37 | 4 | 0.0100 | 0.1214 | 0.3287 | 0.4243 | 0.0174 | 0.0763 |
| 26 38 | 4 | 0.0053 | 0.1505 | 0.0648 | 0.7139 | 0.0140 | 0.0330 |
| 27 39 | 4 | 0.0301 | 0.0671 | 0.2257 | 0.5335 | 0.0308 | 0.0523 |
| 28 40 | 6 | 0.0105 | 0.2887 | 0.0884 | 0.0645 | 0.0470 | 0.4715 |

**Fuzzy Clustering Report**

| | |
|---|---|
| Page/Date/Time | 35 4/14/2005 11:44:58 PM |
| Database | |
| Variables | StdFactor1MulSqrtEV1, StdFactor2MulSqrtEV2, StdFactor3MulSqrtEV3 |
| Distance Type | Euclidean |
| Scale Type | None |

**Membership Matrix Section**

| Row | Cluster | Prob in 1 | Prob in 2 | Prob in 3 | Prob in 4 | Prob in 5 | Prob in 6 |
|---|---|---|---|---|---|---|---|
| 29 41 | 3 | 0.0085 | 0.0509 | 0.7125 | 0.0710 | 0.0187 | 0.1198 |
| 30 42 | 6 | 0.0059 | 0.3566 | 0.0785 | 0.0523 | 0.0270 | 0.4619 |
| 31 43 | 7 | 0.0500 | 0.0425 | 0.0526 | 0.0769 | 0.0900 | 0.0348 |
| 32 46 | 2 | 0.0064 | 0.7023 | 0.0525 | 0.1366 | 0.0218 | 0.0580 |
| 33 47 | 6 | 0.0072 | 0.0649 | 0.0934 | 0.0320 | 0.0196 | 0.7690 |
| 34 49 | 3 | 0.0075 | 0.0537 | 0.7205 | 0.1196 | 0.0134 | 0.0698 |
| 35 52 | 4 | 0.0067 | 0.1144 | 0.1585 | 0.6411 | 0.0140 | 0.0474 |
| 36 54 | 2 | 0.0045 | 0.8015 | 0.0374 | 0.0674 | 0.0175 | 0.0560 |
| 37 55 | 2 | 0.0026 | 0.8389 | 0.0310 | 0.0386 | 0.0137 | 0.0652 |
| 38 56 | 6 | 0.0238 | 0.1130 | 0.1310 | 0.0650 | 0.0713 | 0.5517 |
| 39 58 | 2 | 0.0040 | 0.8197 | 0.0340 | 0.0654 | 0.0152 | 0.0479 |
| 40 60 | 4 | 0.0062 | 0.0453 | 0.0512 | 0.8493 | 0.0106 | 0.0191 |
| 41 61 | 1 | 0.6016 | 0.0495 | 0.1077 | 0.0705 | 0.0436 | 0.0669 |
| 42 63 | 1 | 0.8661 | 0.0158 | 0.0322 | 0.0263 | 0.0150 | 0.0181 |
| 43 64 | 5 | 0.0061 | 0.0190 | 0.0200 | 0.0222 | 0.7237 | 0.0180 |
| 44 65 | 4 | 0.0112 | 0.0560 | 0.1461 | 0.7000 | 0.0192 | 0.0346 |
| 45 67 | 5 | 0.0113 | 0.0507 | 0.0444 | 0.0368 | 0.7101 | 0.0683 |
| 46 68 | 3 | 0.0073 | 0.0789 | 0.5924 | 0.0723 | 0.0163 | 0.2178 |
| 47 71 | 5 | 0.0211 | 0.0483 | 0.0760 | 0.0540 | 0.5408 | 0.0697 |
| 48 72 | 6 | 0.0193 | 0.0911 | 0.1296 | 0.0545 | 0.0515 | 0.6204 |
| 49 73 | 2 | 0.0040 | 0.8144 | 0.0345 | 0.0523 | 0.0178 | 0.0626 |
| 50 74 | 7 | 0.1112 | 0.1316 | 0.1172 | 0.1645 | 0.1354 | 0.1003 |
| 51 75 | 3 | 0.0094 | 0.1642 | 0.4126 | 0.2586 | 0.0187 | 0.1159 |
| 52 77 | 7 | 0.2932 | 0.0529 | 0.1038 | 0.0992 | 0.0913 | 0.0566 |
| 53 80 | 3 | 0.0193 | 0.0671 | 0.4235 | 0.3740 | 0.0223 | 0.0599 |
| 54 82 | 5 | 0.0091 | 0.0400 | 0.0301 | 0.0396 | 0.6531 | 0.0307 |
| 55 83 | 2 | 0.0055 | 0.4560 | 0.0938 | 0.3486 | 0.0179 | 0.0588 |
| 56 84 | 4 | 0.1053 | 0.0866 | 0.1604 | 0.3373 | 0.0626 | 0.0647 |
| 57 85 | 5 | 0.0144 | 0.0297 | 0.0398 | 0.0379 | 0.5042 | 0.0325 |
| 58 86 | 4 | 0.0116 | 0.0857 | 0.0775 | 0.6889 | 0.0340 | 0.0353 |
| 59 87 | 6 | 0.0110 | 0.1077 | 0.0840 | 0.0446 | 0.0411 | 0.6869 |
| 60 89 | 7 | 0.0355 | 0.0718 | 0.0626 | 0.1196 | 0.1168 | 0.0460 |
| 61 90 | 5 | 0.0020 | 0.0090 | 0.0077 | 0.0079 | 0.9355 | 0.0089 |
| 62 91 | 3 | 0.1800 | 0.0713 | 0.3891 | 0.1201 | 0.0489 | 0.1259 |
| 63 92 | 1 | 0.6162 | 0.0406 | 0.0692 | 0.0636 | 0.0539 | 0.0440 |
| 64 93 | 6 | 0.0063 | 0.0781 | 0.0623 | 0.0297 | 0.0246 | 0.7843 |
| 65 95 | 2 | 0.0032 | 0.8169 | 0.0348 | 0.0420 | 0.0136 | 0.0789 |
| 66 97 | 4 | 0.0137 | 0.1054 | 0.0935 | 0.5969 | 0.0500 | 0.0444 |
| 67 98 | 2 | 0.0033 | 0.7907 | 0.0372 | 0.1052 | 0.0129 | 0.0377 |
| 68 99 | 6 | 0.0083 | 0.1522 | 0.3314 | 0.0847 | 0.0198 | 0.3864 |
| 69 101 | 7 | 0.0374 | 0.0454 | 0.0740 | 0.0625 | 0.3117 | 0.0548 |
| 70 102 | 7 | 0.0259 | 0.0714 | 0.0558 | 0.1034 | 0.1495 | 0.0446 |
| 71 103 | 2 | 0.0053 | 0.5178 | 0.1067 | 0.2624 | 0.0188 | 0.0699 |
| 72 104 | 5 | 0.0054 | 0.0289 | 0.0212 | 0.0219 | 0.8366 | 0.0281 |

## Fuzzy Clustering Report

Page/Date/Time 36 4/14/2005 11:44:58 PM
Database
Variables StdFactor1MulSqrtEV1, StdFactor2MulSqrtEV2, StdFactor3MulSqrtEV3
Distance Type Euclidean
Scale Type None

**Membership Matrix Section**

| Row | Cluster | Prob in 1 | Prob in 2 | Prob in 3 | Prob in 4 | Prob in 5 | Prob in 6 |
|---|---|---|---|---|---|---|---|
| 73 105 | 7 | 0.1216 | 0.0652 | 0.0823 | 0.1167 | 0.0988 | 0.0535 |
| 74 107 | 6 | 0.0058 | 0.1248 | 0.1463 | 0.0493 | 0.0255 | 0.6315 |
| 75 110 | 7 | 0.0192 | 0.0386 | 0.0585 | 0.0602 | 0.2906 | 0.0390 |
| 76 113 | 2 | 0.0050 | 0.5658 | 0.1135 | 0.0878 | 0.0209 | 0.1907 |
| 77 114 | 2 | 0.0132 | 0.5439 | 0.0762 | 0.1769 | 0.0491 | 0.0903 |
| 78 115 | 6 | 0.0083 | 0.1143 | 0.2378 | 0.0648 | 0.0366 | 0.5141 |
| 79 117 | 6 | 0.0058 | 0.3569 | 0.1434 | 0.0760 | 0.0237 | 0.3769 |
| 80 118 | 5 | 0.0096 | 0.0296 | 0.0290 | 0.0375 | 0.4779 | 0.0244 |
| 81 120 | 7 | 0.0424 | 0.0328 | 0.0477 | 0.0621 | 0.0853 | 0.0289 |
| 82 121 | 5 | 0.0084 | 0.0225 | 0.0270 | 0.0268 | 0.7035 | 0.0235 |
| 83 122 | 5 | 0.0082 | 0.0391 | 0.0334 | 0.0287 | 0.7792 | 0.0498 |
| 84 124 | 4 | 0.0422 | 0.2316 | 0.1150 | 0.2616 | 0.0970 | 0.1022 |
| 85 125 | 5 | 0.0126 | 0.0553 | 0.0506 | 0.0404 | 0.6825 | 0.0794 |
| 86 126 | 2 | 0.0033 | 0.8410 | 0.0292 | 0.0601 | 0.0138 | 0.0402 |
| 87 127 | 5 | 0.0133 | 0.0655 | 0.0439 | 0.0632 | 0.5217 | 0.0453 |
| 88 128 | 7 | 0.2201 | 0.0616 | 0.0885 | 0.1043 | 0.0986 | 0.0570 |
| 89 129 | 4 | 0.0189 | 0.2540 | 0.0969 | 0.4547 | 0.0429 | 0.0689 |
| 90 130 | 1 | 0.3540 | 0.0656 | 0.2473 | 0.1039 | 0.0524 | 0.1057 |
| 91 131 | 7 | 0.0757 | 0.0727 | 0.1883 | 0.1051 | 0.2110 | 0.1137 |
| 92 132 | 6 | 0.0077 | 0.2698 | 0.0772 | 0.0537 | 0.0363 | 0.5335 |
| 93 133 | 5 | 0.0042 | 0.0159 | 0.0138 | 0.0158 | 0.8559 | 0.0143 |
| 94 134 | 1 | 0.5942 | 0.0530 | 0.0829 | 0.0755 | 0.0527 | 0.0567 |
| 95 135 | 2 | 0.0044 | 0.6443 | 0.0951 | 0.1424 | 0.0164 | 0.0825 |
| 96 136 | 5 | 0.0246 | 0.0473 | 0.0628 | 0.0496 | 0.5683 | 0.0639 |
| 97 138 | 5 | 0.0109 | 0.0395 | 0.0509 | 0.0385 | 0.7066 | 0.0538 |
| 98 139 | 2 | 0.0074 | 0.4966 | 0.0710 | 0.0632 | 0.0378 | 0.3003 |
| 99 140 | 2 | 0.0033 | 0.7438 | 0.0569 | 0.1225 | 0.0117 | 0.0505 |
| 100 141 | 3 | 0.0990 | 0.0708 | 0.4860 | 0.1144 | 0.0421 | 0.1362 |
| 101 142 | 1 | 0.8863 | 0.0122 | 0.0292 | 0.0212 | 0.0127 | 0.0146 |
| 102 143 | 6 | 0.0257 | 0.0831 | 0.2897 | 0.0690 | 0.0400 | 0.4603 |
| 103 144 | 7 | 0.0759 | 0.0992 | 0.0903 | 0.1520 | 0.1215 | 0.0687 |
| 104 146 | 3 | 0.1867 | 0.0652 | 0.3879 | 0.1380 | 0.0497 | 0.0957 |
| 105 147 | 2 | 0.0049 | 0.6817 | 0.0642 | 0.1200 | 0.0298 | 0.0760 |
| 106 148 | 5 | 0.0076 | 0.0220 | 0.0232 | 0.0265 | 0.6737 | 0.0204 |
| 107 149 | 2 | 0.0020 | 0.8631 | 0.0288 | 0.0568 | 0.0082 | 0.0338 |
| 108 150 | 2 | 0.0074 | 0.6620 | 0.0579 | 0.0720 | 0.0340 | 0.1421 |
| 109 151 | 2 | 0.0028 | 0.8157 | 0.0338 | 0.0387 | 0.0140 | 0.0852 |
| 110 152 | 5 | 0.0043 | 0.0212 | 0.0175 | 0.0164 | 0.8773 | 0.0239 |
| 111 153 | 5 | 0.0028 | 0.0116 | 0.0105 | 0.0100 | 0.9212 | 0.0128 |
| 112 154 | 7 | 0.0162 | 0.0291 | 0.0375 | 0.0418 | 0.2879 | 0.0279 |
| 113 155 | 5 | 0.0115 | 0.0378 | 0.0466 | 0.0348 | 0.7265 | 0.0547 |
| 114 156 | 7 | 0.0172 | 0.0432 | 0.0387 | 0.0695 | 0.1264 | 0.0289 |
| 115 158 | 3 | 0.0103 | 0.0568 | 0.6156 | 0.0576 | 0.0188 | 0.2240 |
| 116 159 | 5 | 0.0072 | 0.0311 | 0.0238 | 0.0304 | 0.7450 | 0.0249 |

## Fuzzy Clustering Report

| | |
|---|---|
| Page/Date/Time | 37 4/14/2005 11:44:58 PM |
| Database | |
| Variables | StdFactor1MulSqrtEV1, StdFactor2MulSqrtEV2, StdFactor3MulSqrtEV3 |
| Distance Type | Euclidean |
| Scale Type | None |

**Membership Matrix Section**

| Row | Cluster | Prob in 1 | Prob in 2 | Prob in 3 | Prob in 4 | Prob in 5 | Prob in 6 |
|---|---|---|---|---|---|---|---|
| 117 161 | 3 | 0.0915 | 0.0899 | 0.3423 | 0.1011 | 0.0686 | 0.2417 |
| 118 163 | 4 | 0.0177 | 0.0598 | 0.1051 | 0.7169 | 0.0221 | 0.0333 |
| 119 164 | 6 | 0.0076 | 0.2349 | 0.2885 | 0.1046 | 0.0209 | 0.3256 |
| 120 165 | 7 | 0.1592 | 0.0536 | 0.0789 | 0.0924 | 0.0995 | 0.0499 |
| 121 168 | 4 | 0.0115 | 0.0736 | 0.0711 | 0.7641 | 0.0178 | 0.0302 |
| 122 171 | 4 | 0.0069 | 0.2183 | 0.0647 | 0.6172 | 0.0228 | 0.0399 |
| 123 172 | 3 | 0.0107 | 0.0502 | 0.7087 | 0.1222 | 0.0196 | 0.0659 |

**Membership Matrix Section**

| Row | Cluster | Prob in 7 |
|---|---|---|
| 1 1 | 3 | 0.0185 |
| 2 2 | 3 | 0.0147 |
| 3 3 | 4 | 0.0228 |
| 4 4 | 2 | 0.0141 |
| 5 6 | 5 | 0.0313 |
| 6 7 | 6 | 0.0134 |
| 7 10 | 6 | 0.0179 |
| 8 11 | 3 | 0.0564 |
| 9 12 | 2 | 0.0123 |
| 10 13 | 6 | 0.0226 |
| 11 14 | 6 | 0.0219 |
| 12 15 | 3 | 0.0250 |
| 13 19 | 5 | 0.2948 |
| 14 20 | 4 | 0.0205 |
| 15 21 | 5 | 0.0564 |
| 16 22 | 4 | 0.0134 |
| 17 26 | 5 | 0.0636 |
| 18 27 | 1 | 0.1390 |
| 19 29 | 3 | 0.0410 |
| 20 31 | 5 | 0.0527 |
| 21 32 | 7 | 0.5613 |
| 22 34 | 2 | 0.0100 |
| 23 35 | 5 | 0.1184 |
| 24 36 | 1 | 0.0874 |
| 25 37 | 4 | 0.0217 |
| 26 38 | 4 | 0.0186 |
| 27 39 | 4 | 0.0604 |
| 28 40 | 6 | 0.0295 |
| 29 41 | 3 | 0.0185 |
| 30 42 | 6 | 0.0178 |
| 31 43 | 7 | 0.6531 |
| 32 46 | 2 | 0.0224 |
| 33 47 | 6 | 0.0138 |
| 34 49 | 3 | 0.0154 |

## Fuzzy Clustering Report

| | |
|---|---|
| Page/Date/Time | 38 4/14/2005 11:44:58 PM |
| Database | |
| Variables | StdFactor1MulSqrtEV1, StdFactor2MulSqrtEV2, StdFactor3MulSqrtEV3 |
| Distance Type | Euclidean |
| Scale Type | None |

**Membership Matrix Section**

| Row | Cluster | Prob in 7 |
|---|---|---|
| 35 52 | 4 | 0.0179 |
| 36 54 | 2 | 0.0156 |
| 37 55 | 2 | 0.0100 |
| 38 56 | 6 | 0.0442 |
| 39 58 | 2 | 0.0138 |
| 40 60 | 4 | 0.0182 |
| 41 61 | 1 | 0.0601 |
| 42 63 | 1 | 0.0264 |
| 43 64 | 5 | 0.1910 |
| 44 65 | 4 | 0.0329 |
| 45 67 | 5 | 0.0785 |
| 46 68 | 3 | 0.0150 |
| 47 71 | 5 | 0.1901 |
| 48 72 | 6 | 0.0336 |
| 49 73 | 2 | 0.0143 |
| 50 74 | 7 | 0.2398 |
| 51 75 | 3 | 0.0206 |
| 52 77 | 7 | 0.3029 |
| 53 80 | 3 | 0.0338 |
| 54 82 | 5 | 0.1974 |
| 55 83 | 2 | 0.0195 |
| 56 84 | 4 | 0.1829 |
| 57 85 | 5 | 0.3414 |
| 58 86 | 4 | 0.0670 |
| 59 87 | 6 | 0.0247 |
| 60 89 | 7 | 0.5476 |
| 61 90 | 5 | 0.0290 |
| 62 91 | 3 | 0.0647 |
| 63 92 | 1 | 0.1123 |
| 64 93 | 6 | 0.0148 |
| 65 95 | 2 | 0.0105 |
| 66 97 | 4 | 0.0961 |
| 67 98 | 2 | 0.0128 |
| 68 99 | 6 | 0.0172 |
| 69 101 | 7 | 0.4142 |
| 70 102 | 7 | 0.5493 |
| 71 103 | 2 | 0.0191 |
| 72 104 | 5 | 0.0579 |
| 73 105 | 7 | 0.4620 |
| 74 107 | 6 | 0.0167 |
| 75 110 | 7 | 0.4939 |
| 76 113 | 2 | 0.0162 |
| 77 114 | 2 | 0.0504 |
| 78 115 | 6 | 0.0240 |

## Fuzzy Clustering Report

| | |
|---|---|
| Page/Date/Time | 39 4/14/2005 11:44:58 PM |
| Database | |
| Variables | StdFactor1MulSqrtEV1, StdFactor2MulSqrtEV2, StdFactor3MulSqrtEV3 |
| Distance Type | Euclidean |
| Scale Type | None |

**Membership Matrix Section**

| Row | Cluster | Prob in 7 |
|---|---|---|
| 79 117 | 6 | 0.0174 |
| 80 118 | 5 | 0.3920 |
| 81 120 | 7 | 0.7007 |
| 82 121 | 5 | 0.1884 |
| 83 122 | 5 | 0.0615 |
| 84 124 | 4 | 0.1504 |
| 85 125 | 5 | 0.0792 |
| 86 126 | 2 | 0.0123 |
| 87 127 | 5 | 0.2471 |
| 88 128 | 7 | 0.3699 |
| 89 129 | 4 | 0.0638 |
| 90 130 | 1 | 0.0712 |
| 91 131 | 7 | 0.2335 |
| 92 132 | 6 | 0.0220 |
| 93 133 | 5 | 0.0802 |
| 94 134 | 1 | 0.0850 |
| 95 135 | 2 | 0.0149 |
| 96 136 | 5 | 0.1835 |
| 97 138 | 5 | 0.0998 |
| 98 139 | 2 | 0.0237 |
| 99 140 | 2 | 0.0112 |
| 100 141 | 3 | 0.0516 |
| 101 142 | 1 | 0.0237 |
| 102 143 | 6 | 0.0322 |
| 103 144 | 7 | 0.3923 |
| 104 146 | 3 | 0.0769 |
| 105 147 | 2 | 0.0233 |
| 106 148 | 5 | 0.2266 |
| 107 149 | 2 | 0.0073 |
| 108 150 | 2 | 0.0245 |
| 109 151 | 2 | 0.0099 |
| 110 152 | 5 | 0.0395 |
| 111 153 | 5 | 0.0310 |
| 112 154 | 7 | 0.5597 |
| 113 155 | 5 | 0.0881 |
| 114 156 | 7 | 0.6762 |
| 115 158 | 3 | 0.0167 |
| 116 159 | 5 | 0.1377 |
| 117 161 | 3 | 0.0648 |
| 118 163 | 4 | 0.0451 |
| 119 164 | 6 | 0.0178 |
| 120 165 | 7 | 0.4665 |
| 121 168 | 4 | 0.0317 |
| 122 171 | 4 | 0.0300 |

**Fuzzy Clustering Report**

| | |
|---|---|
| Page/Date/Time | 40 4/14/2005 11:44:58 PM |
| Database | |
| Variables | StdFactor1MulSqrtEV1, StdFactor2MulSqrtEV2, StdFactor3MulSqrtEV3 |
| Distance Type | Euclidean |
| Scale Type | None |

**Membership Matrix Section**

| Row | Cluster | Prob in 7 |
|---|---|---|
| 123 172 | 3 | 0.0227 |

**Cluster Medoids Section**

| Variable | Cluster1 | Cluster2 | Cluster3 | Cluster4 | Cluster5 | Cluster6 | |
|---|---|---|---|---|---|---|---|
| StdFactor1MulSqrtEV1 | | 0.9063011 | 0.5878857 | -0.2682966 | -0.3967205 | 0.7004431 | |
| | 1.227158 | | | | | | |
| StdFactor2MulSqrtEV2 | | 1.150979 | 0.6884689 | 0.5796099 | 0.2817987 | -0.9617402 | - |
| 0.4964103 | | | | | | | |
| StdFactor3MulSqrtEV3 | | 0.4075354 | -0.7763955 | 6.064208E-02 | -0.7347661 | 8.904137E-02 | |
| | 0.2630298 | | | | | | |
| Row | 64 93 | 86 126 | 34 49 | 40 60 | 106 148 | 110 152 | |

**Cluster Medoids Section**

| Variable | Cluster7 | Cluster8 | |
|---|---|---|---|
| StdFactor1MulSqrtEV1 | | -1.260633 | -0.9864943 |
| StdFactor2MulSqrtEV2 | | 0.7234391 | -2.231869 |
| StdFactor3MulSqrtEV3 | | 0.9549915 | -8.620162E-02 |
| Row | 62 91 | 120 165 | |

**Membership Summary Section for Clusters = 8**

<table>
<tr><th>Row</th><th>Cluster</th><th>Cluster Membership</th><th>Sum of Squared Memberships</th><th>Bar of Squared Memberships</th><th>Silhouette Amount</th><th>Silhouette Bar</th></tr>
<tr><td>64 93</td><td>1</td><td>0.8121</td><td>0.6672</td><td>|||||||||||||||||||||</td><td>0.4862</td><td>||||||||||||||||</td></tr>
<tr><td>33 47</td><td>1</td><td>0.7892</td><td>0.6330</td><td>||||||||||||||||||||</td><td>0.4062</td><td>|||||||||||||</td></tr>
<tr><td>10 13</td><td>1</td><td>0.7536</td><td>0.5796</td><td>||||||||||||||||||</td><td>0.5221</td><td>|||||||||||||||||</td></tr>
<tr><td>59 87</td><td>1</td><td>0.7120</td><td>0.5235</td><td>|||||||||||||||||</td><td>0.4645</td><td>|||||||||||||||</td></tr>
<tr><td>6 7</td><td>1</td><td>0.6995</td><td>0.5157</td><td>||||||||||||||||</td><td>0.1209</td><td>|||||</td></tr>
<tr><td>7 10</td><td>1</td><td>0.6286</td><td>0.4385</td><td>||||||||||||||</td><td>0.1526</td><td>||||||</td></tr>
<tr><td>48 72</td><td>1</td><td>0.6244</td><td>0.4151</td><td>|||||||||||||</td><td>0.4387</td><td>||||||||||||||</td></tr>
<tr><td>74 107</td><td>1</td><td>0.5832</td><td>0.3914</td><td>|||||||||||||</td><td>0.1202</td><td>|||||</td></tr>
<tr><td>38 56</td><td>1</td><td>0.5514</td><td>0.3384</td><td>|||||||||||</td><td>0.4436</td><td>||||||||||||||</td></tr>
<tr><td>92 132</td><td>1</td><td>0.5469</td><td>0.3667</td><td>||||||||||||</td><td>0.0908</td><td>||||</td></tr>
<tr><td>11 14</td><td>1</td><td>0.4963</td><td>0.3236</td><td>|||||||||||</td><td>-0.1389</td><td>|</td></tr>
<tr><td>28 40</td><td>1</td><td>0.4903</td><td>0.3192</td><td>|||||||||||</td><td>0.0854</td><td>||||</td></tr>
<tr><td>30 42</td><td>1</td><td>0.4708</td><td>0.3364</td><td>|||||||||||</td><td>-0.0968</td><td>|</td></tr>
<tr><td>78 115</td><td>1</td><td>0.4540</td><td>0.3004</td><td>||||||||||</td><td>-0.0536</td><td>|</td></tr>
<tr><td>102 143</td><td>1</td><td>0.4520</td><td>0.2715</td><td>|||||||||</td><td>0.0588</td><td>|||</td></tr>
<tr><td>79 117</td><td>1</td><td>0.3257</td><td>0.2634</td><td>|||||||||</td><td>-0.2308</td><td>|</td></tr>
<tr><td>86 126</td><td>2</td><td>0.8444</td><td>0.7185</td><td>|||||||||||||||||||||||</td><td>0.6280</td><td>||||||||||||||||||||</td></tr>
<tr><td>107 149</td><td>2</td><td>0.8406</td><td>0.7133</td><td>||||||||||||||||||||||</td><td>0.6121</td><td>|||||||||||||||||||</td></tr>
<tr><td>37 55</td><td>2</td><td>0.8261</td><td>0.6897</td><td>||||||||||||||||||||||</td><td>0.5976</td><td>|||||||||||||||||||</td></tr>
<tr><td>39 58</td><td>2</td><td>0.8219</td><td>0.6827</td><td>|||||||||||||||||||||</td><td>0.6205</td><td>||||||||||||||||||||</td></tr>
<tr><td>49 73</td><td>2</td><td>0.8147</td><td>0.6711</td><td>|||||||||||||||||||||</td><td>0.6275</td><td>||||||||||||||||||||</td></tr>
<tr><td>65 95</td><td>2</td><td>0.8099</td><td>0.6650</td><td>|||||||||||||||||||||</td><td>0.5768</td><td>||||||||||||||||||</td></tr>
<tr><td>109 151</td><td>2</td><td>0.8040</td><td>0.6564</td><td>|||||||||||||||||||||</td><td>0.5604</td><td>||||||||||||||||||</td></tr>
<tr><td>36 54</td><td>2</td><td>0.8026</td><td>0.6528</td><td>|||||||||||||||||||||</td><td>0.6195</td><td>||||||||||||||||||||</td></tr>
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## Fuzzy Clustering Report

Page/Date/Time 41 4/14/2005 11:44:58 PM
Database
Variables StdFactor1MulSqrtEV1, StdFactor2MulSqrtEV2, StdFactor3MulSqrtEV3
Distance Type Euclidean
Scale Type None

**Membership Summary Section for Clusters = 8**

<table>
<tr><th>Row</th><th>Cluster</th><th>Cluster Membership</th><th>Sum of Squared Memberships</th><th>Bar of Squared Memberships</th><th>Silhouette Amount</th><th>Silhouette Bar</th></tr>
<tr><td>67 98</td><td>2</td><td>0.7766</td><td>0.6172</td><td>||||||||||||||||||||</td><td>0.5469</td><td>|||||||||||||||||</td></tr>
<tr><td>22 34</td><td>2</td><td>0.7478</td><td>0.5777</td><td>||||||||||||||||||</td><td>0.5538</td><td>||||||||||||||||||</td></tr>
<tr><td>32 46</td><td>2</td><td>0.6940</td><td>0.5057</td><td>||||||||||||||||</td><td>0.4966</td><td>||||||||||||||||</td></tr>
<tr><td>99 140</td><td>2</td><td>0.6909</td><td>0.5060</td><td>||||||||||||||||</td><td>0.5097</td><td>||||||||||||||||</td></tr>
<tr><td>9 12</td><td>2</td><td>0.6513</td><td>0.4613</td><td>|||||||||||||||</td><td>0.4701</td><td>|||||||||||||||</td></tr>
<tr><td>108 150</td><td>2</td><td>0.6503</td><td>0.4514</td><td>|||||||||||||||</td><td>0.4852</td><td>||||||||||||||||</td></tr>
<tr><td>105 147</td><td>2</td><td>0.6395</td><td>0.4394</td><td>||||||||||||||</td><td>0.5242</td><td>|||||||||||||||||</td></tr>
<tr><td>4 4</td><td>2</td><td>0.6356</td><td>0.4474</td><td>||||||||||||||</td><td>0.4001</td><td>|||||||||||||</td></tr>
<tr><td>95 135</td><td>2</td><td>0.5595</td><td>0.3738</td><td>||||||||||||</td><td>0.3936</td><td>|||||||||||||</td></tr>
<tr><td>77 114</td><td>2</td><td>0.5299</td><td>0.3282</td><td>|||||||||||</td><td>0.3961</td><td>|||||||||||||</td></tr>
<tr><td>76 113</td><td>2</td><td>0.4982</td><td>0.3237</td><td>|||||||||||</td><td>0.3301</td><td>|||||||||||</td></tr>
<tr><td>98 139</td><td>2</td><td>0.4680</td><td>0.3200</td><td>|||||||||||</td><td>0.2268</td><td>||||||||</td></tr>
<tr><td>71 103</td><td>2</td><td>0.4444</td><td>0.3005</td><td>||||||||||</td><td>0.3538</td><td>||||||||||||</td></tr>
<tr><td>55 83</td><td>2</td><td>0.4056</td><td>0.2950</td><td>||||||||||</td><td>0.3056</td><td>||||||||||</td></tr>
<tr><td>34 49</td><td>3</td><td>0.7911</td><td>0.6363</td><td>||||||||||||||||||||</td><td>0.5807</td><td>||||||||||||||||||</td></tr>
<tr><td>123 172</td><td>3</td><td>0.6973</td><td>0.5061</td><td>||||||||||||||||</td><td>0.5219</td><td>|||||||||||||||||</td></tr>
<tr><td>12 15</td><td>3</td><td>0.6779</td><td>0.4955</td><td>||||||||||||||||</td><td>0.3901</td><td>|||||||||||||</td></tr>
<tr><td>29 41</td><td>3</td><td>0.6530</td><td>0.4527</td><td>|||||||||||||||</td><td>0.5385</td><td>|||||||||||||||||</td></tr>
<tr><td>51 75</td><td>3</td><td>0.6431</td><td>0.4493</td><td>||||||||||||||</td><td>0.3546</td><td>||||||||||||</td></tr>
<tr><td>46 68</td><td>3</td><td>0.6382</td><td>0.4465</td><td>||||||||||||||</td><td>0.4969</td><td>||||||||||||||||</td></tr>
<tr><td>2 2</td><td>3</td><td>0.6010</td><td>0.3978</td><td>|||||||||||||</td><td>0.5706</td><td>||||||||||||||||||</td></tr>
<tr><td>25 37</td><td>3</td><td>0.5663</td><td>0.3946</td><td>|||||||||||||</td><td>0.2595</td><td>|||||||||</td></tr>
<tr><td>115 158</td><td>3</td><td>0.5203</td><td>0.3418</td><td>|||||||||||</td><td>0.4045</td><td>|||||||||||||</td></tr>
<tr><td>53 80</td><td>3</td><td>0.4613</td><td>0.3234</td><td>|||||||||||</td><td>0.2126</td><td>|||||||</td></tr>
<tr><td>119 164</td><td>3</td><td>0.4451</td><td>0.2939</td><td>||||||||||</td><td>0.1780</td><td>||||||</td></tr>
<tr><td>68 99</td><td>3</td><td>0.4251</td><td>0.3001</td><td>||||||||||</td><td>0.2854</td><td>||||||||||</td></tr>
<tr><td>19 29</td><td>3</td><td>0.3797</td><td>0.2361</td><td>||||||||</td><td>0.4084</td><td>|||||||||||||</td></tr>
<tr><td>1 1</td><td>3</td><td>0.3671</td><td>0.2841</td><td>||||||||||</td><td>0.3194</td><td>|||||||||||</td></tr>
<tr><td>40 60</td><td>4</td><td>0.8417</td><td>0.7151</td><td>||||||||||||||||||||||</td><td>0.4683</td><td>|||||||||||||||</td></tr>
<tr><td>3 3</td><td>4</td><td>0.8059</td><td>0.6595</td><td>|||||||||||||||||||||</td><td>0.3901</td><td>|||||||||||||</td></tr>
<tr><td>121 168</td><td>4</td><td>0.7618</td><td>0.5934</td><td>|||||||||||||||||||</td><td>0.4681</td><td>|||||||||||||||</td></tr>
<tr><td>16 22</td><td>4</td><td>0.7447</td><td>0.5796</td><td>||||||||||||||||||</td><td>0.2802</td><td>|||||||||</td></tr>
<tr><td>118 163</td><td>4</td><td>0.7059</td><td>0.5183</td><td>|||||||||||||||||</td><td>0.3892</td><td>|||||||||||||</td></tr>
<tr><td>58 86</td><td>4</td><td>0.6966</td><td>0.5039</td><td>||||||||||||||||</td><td>0.4001</td><td>|||||||||||||</td></tr>
<tr><td>26 38</td><td>4</td><td>0.6577</td><td>0.4701</td><td>|||||||||||||||</td><td>0.1158</td><td>||||</td></tr>
<tr><td>44 65</td><td>4</td><td>0.6441</td><td>0.4605</td><td>|||||||||||||||</td><td>0.1754</td><td>||||||</td></tr>
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<tr><td>66 97</td><td>4</td><td>0.6014</td><td>0.3926</td><td>|||||||||||||</td><td>0.3302</td><td>|||||||||||</td></tr>
<tr><td>14 20</td><td>4</td><td>0.5498</td><td>0.3706</td><td>||||||||||||</td><td>0.1591</td><td>||||||</td></tr>
<tr><td>27 39</td><td>4</td><td>0.4977</td><td>0.3190</td><td>|||||||||||</td><td>0.1259</td><td>|||||</td></tr>
<tr><td>35 52</td><td>4</td><td>0.4741</td><td>0.3555</td><td>||||||||||||</td><td>-0.0588</td><td>|</td></tr>
<tr><td>89 129</td><td>4</td><td>0.4409</td><td>0.2742</td><td>|||||||||</td><td>0.1163</td><td>||||</td></tr>
</table>

## Fuzzy Clustering Report

Page/Date/Time 42 4/14/2005 11:44:58 PM
Database
Variables StdFactor1MulSqrtEV1, StdFactor2MulSqrtEV2, StdFactor3MulSqrtEV3
Distance Type Euclidean
Scale Type None

### Membership Summary Section for Clusters = 8

| Row | Cluster | Cluster Membership | Sum of Squared Memberships | Bar of Squared Memberships | Silhouette Amount | Silhouette Bar |
|---|---|---|---|---|---|---|
| 56 84 | 4 | 0.3157 | 0.1787 | \|IIIII | 0.2712 | \|IIIIIIII |
| 84 124 | 4 | 0.2486 | 0.1596 | \|IIIII | 0.0246 | \|I |
| 106 148 | 5 | 0.8805 | 0.7823 | \|IIIIIIIIIIIIIIIIIIIIIII | 0.2613 | \|IIIIIIII |
| 43 64 | 5 | 0.8613 | 0.7525 | \|IIIIIIIIIIIIIIIIIIIIIII | 0.1889 | \|IIIIII |
| 80 118 | 5 | 0.8447 | 0.7225 | \|IIIIIIIIIIIIIIIIIIIIII | 0.3461 | \|IIIIIIIIII |
| 82 121 | 5 | 0.7961 | 0.6557 | \|IIIIIIIIIIIIIIIIIIII | 0.1210 | \|IIII |
| 21 32 | 5 | 0.7885 | 0.6326 | \|IIIIIIIIIIIIIIIIIII | 0.3674 | \|IIIIIIIIIII |
| 112 154 | 5 | 0.7607 | 0.5931 | \|IIIIIIIIIIIIIIIIII | 0.3624 | \|IIIIIIIIIII |
| 57 85 | 5 | 0.7597 | 0.5994 | \|IIIIIIIIIIIIIIIIII | 0.2072 | \|IIIIII |
| 13 19 | 5 | 0.7443 | 0.5800 | \|IIIIIIIIIIIIIIIII | 0.2360 | \|IIIIIII |
| 75 110 | 5 | 0.6958 | 0.5048 | \|IIIIIIIIIIIIIII | 0.3091 | \|IIIIIIIII |
| 54 82 | 5 | 0.5130 | 0.3802 | \|IIIIIIIIIII | 0.0868 | \|III |
| 116 159 | 5 | 0.5120 | 0.3994 | \|IIIIIIIIIIII | 0.0248 | \|I |
| 93 133 | 5 | 0.5017 | 0.4310 | \|IIIIIIIIIIIII | -0.1014 | \| |
| 69 101 | 5 | 0.4927 | 0.2991 | \|IIIIIIIII | 0.1731 | \|IIIII |
| 87 127 | 5 | 0.4468 | 0.3098 | \|IIIIIIIII | 0.0989 | \|III |
| 114 156 | 5 | 0.4007 | 0.2259 | \|IIIIIII | 0.3375 | \|IIIIIIIIII |
| 47 71 | 5 | 0.3877 | 0.2973 | \|IIIIIIIII | -0.2012 | \| |
| 70 102 | 5 | 0.2984 | 0.1749 | \|IIIII | 0.2676 | \|IIIIIIII |
| 91 131 | 5 | 0.2414 | 0.1481 | \|IIII | 0.0365 | \|I |
| 110 152 | 6 | 0.9153 | 0.8404 | \|IIIIIIIIIIIIIIIIIIIIIIIII | 0.5766 | \|IIIIIIIIIIIIIIIII |
| 111 153 | 6 | 0.8897 | 0.7979 | \|IIIIIIIIIIIIIIIIIIIIIIII | 0.5112 | \|IIIIIIIIIIIIIII |
| 15 21 | 6 | 0.8712 | 0.7644 | \|IIIIIIIIIIIIIIIIIIIIIII | 0.5461 | \|IIIIIIIIIIIIIIII |
| 83 122 | 6 | 0.8595 | 0.7444 | \|IIIIIIIIIIIIIIIIIIIIII | 0.5951 | \|IIIIIIIIIIIIIIIIII |
| 72 104 | 6 | 0.8285 | 0.6975 | \|IIIIIIIIIIIIIIIIIIIII | 0.4670 | \|IIIIIIIIIIIIII |
| 61 90 | 6 | 0.8224 | 0.6955 | \|IIIIIIIIIIIIIIIIIIIII | 0.4035 | \|IIIIIIIIIIII |
| 45 67 | 6 | 0.7946 | 0.6419 | \|IIIIIIIIIIIIIIIIIII | 0.5773 | \|IIIIIIIIIIIIIIIII |
| 5 6 | 6 | 0.7788 | 0.6380 | \|IIIIIIIIIIIIIIIIIII | 0.3683 | \|IIIIIIIIIII |
| 85 125 | 6 | 0.7674 | 0.6019 | \|IIIIIIIIIIIIIIIIII | 0.5718 | \|IIIIIIIIIIIIIIIII |
| 113 155 | 6 | 0.6469 | 0.4642 | \|IIIIIIIIIIIIII | 0.4277 | \|IIIIIIIIIIIII |
| 97 138 | 6 | 0.5425 | 0.3812 | \|IIIIIIIIIII | 0.3134 | \|IIIIIIIII |
| 20 31 | 6 | 0.5390 | 0.4445 | \|IIIIIIIIIIIII | 0.1874 | \|IIIIII |
| 17 26 | 6 | 0.4795 | 0.4289 | \|IIIIIIIIIIIII | 0.1691 | \|IIIII |
| 23 35 | 6 | 0.4763 | 0.2792 | \|IIIIIIII | 0.4379 | \|IIIIIIIIIIIII |
| 96 136 | 6 | 0.4269 | 0.3067 | \|IIIIIIIII | 0.1963 | \|IIIIII |
| 62 91 | 7 | 0.8632 | 0.7486 | \|IIIIIIIIIIIIIIIIIIIIII | -0.4414 | \| |
| 90 130 | 7 | 0.8368 | 0.7047 | \|IIIIIIIIIIIIIIIIIIIII | -0.2368 | \| |
| 8 11 | 7 | 0.7508 | 0.5763 | \|IIIIIIIIIIIIIIIII | -0.5416 | \| |
| 104 146 | 7 | 0.7470 | 0.5704 | \|IIIIIIIIIIIIIIIII | -0.5053 | \| |
| 100 141 | 7 | 0.7135 | 0.5268 | \|IIIIIIIIIIIIIIII | -0.5632 | \| |
| 24 36 | 7 | 0.5463 | 0.3323 | \|IIIIIIIIII | -0.2741 | \| |
| 101 142 | 7 | 0.5188 | 0.3082 | \|IIIIIIIII | 0.0153 | \| |

## Fuzzy Clustering Report

| | |
|---|---|
| Page/Date/Time | 43 4/14/2005 11:44:58 PM |
| Database | |
| Variables | StdFactor1MulSqrtEV1, StdFactor2MulSqrtEV2, StdFactor3MulSqrtEV3 |
| Distance Type | Euclidean |
| Scale Type | None |

**Membership Summary Section for Clusters = 8**

<table>
<tr><th>Row</th><th>Cluster</th><th>Cluster Membership</th><th>Sum of Squared Memberships</th><th>Bar of Squared Memberships</th><th>Silhouette Amount</th><th>Silhouette Bar</th></tr>
<tr><td>41 61</td><td>7</td><td>0.5134</td><td>0.2993</td><td>|IIIIIIIII</td><td>0.1016</td><td>|III</td></tr>
<tr><td>42 63</td><td>7</td><td>0.4243</td><td>0.2353</td><td>|IIIIIII</td><td>0.0995</td><td>|III</td></tr>
<tr><td>117 161</td><td>7</td><td>0.3499</td><td>0.2043</td><td>|IIIIII</td><td>-0.5058</td><td>|</td></tr>
<tr><td>94 134</td><td>7</td><td>0.2588</td><td>0.1574</td><td>|IIIII</td><td>0.0815</td><td>|II</td></tr>
<tr><td>18 27</td><td>7</td><td>0.1640</td><td>0.1280</td><td>|IIII</td><td>0.1012</td><td>|III</td></tr>
<tr><td>120 165</td><td>8</td><td>0.8767</td><td>0.7711</td><td>|IIIIIIIIIIIIIIIIIIIIIII</td><td>0.2712</td><td>|IIIIIIII</td></tr>
<tr><td>88 128</td><td>8</td><td>0.8361</td><td>0.7033</td><td>|IIIIIIIIIIIIIIIIIIIII</td><td>0.3486</td><td>|IIIIIIIIII</td></tr>
<tr><td>73 105</td><td>8</td><td>0.8179</td><td>0.6742</td><td>|IIIIIIIIIIIIIIIIIIII</td><td>0.3330</td><td>|IIIIIIIIII</td></tr>
<tr><td>31 43</td><td>8</td><td>0.7158</td><td>0.5279</td><td>|IIIIIIIIIIIIIIII</td><td>0.0290</td><td>|I</td></tr>
<tr><td>81 120</td><td>8</td><td>0.5740</td><td>0.3691</td><td>|IIIIIIIIIII</td><td>-0.2168</td><td>|</td></tr>
<tr><td>52 77</td><td>8</td><td>0.5558</td><td>0.3413</td><td>|IIIIIIIIII</td><td>0.0464</td><td>|I</td></tr>
<tr><td>63 92</td><td>8</td><td>0.3792</td><td>0.2119</td><td>|IIIIII</td><td>0.1890</td><td>|IIIIII</td></tr>
<tr><td>103 144</td><td>8</td><td>0.3661</td><td>0.1979</td><td>|IIIIII</td><td>0.1543</td><td>|IIIII</td></tr>
<tr><td>60 89</td><td>8</td><td>0.2818</td><td>0.1746</td><td>|IIIII</td><td>-0.2315</td><td>|</td></tr>
<tr><td>50 74</td><td>8</td><td>0.2370</td><td>0.1425</td><td>|IIII</td><td>0.1197</td><td>|IIII</td></tr>
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**Fuzzy Clustering Report**

Page/Date/Time 44 4/14/2005 11:44:58 PM
Database
Variables StdFactor1MulSqrtEV1, StdFactor2MulSqrtEV2, StdFactor3MulSqrtEV3
Distance Type Euclidean
Scale Type None

**Membership Matrix Section**

| Row | Cluster | Prob in 1 | Prob in 2 | Prob in 3 | Prob in 4 | Prob in 5 | Prob in 6 |
|---|---|---|---|---|---|---|---|
| 1 1 | 3 | 0.3646 | 0.0840 | 0.3671 | 0.0728 | 0.0229 | 0.0245 |
| 2 2 | 3 | 0.1465 | 0.0640 | 0.6010 | 0.0851 | 0.0197 | 0.0191 |
| 3 3 | 4 | 0.0172 | 0.0580 | 0.0763 | 0.8059 | 0.0150 | 0.0109 |
| 4 4 | 2 | 0.1823 | 0.6356 | 0.0854 | 0.0459 | 0.0162 | 0.0205 |
| 5 6 | 6 | 0.0091 | 0.0095 | 0.0092 | 0.0089 | 0.1760 | 0.7788 |
| 6 7 | 1 | 0.6995 | 0.0622 | 0.1421 | 0.0344 | 0.0168 | 0.0208 |
| 7 10 | 1 | 0.6286 | 0.1822 | 0.0863 | 0.0376 | 0.0197 | 0.0278 |
| 8 11 | 7 | 0.0490 | 0.0256 | 0.0841 | 0.0399 | 0.0187 | 0.0169 |
| 9 12 | 2 | 0.0638 | 0.6513 | 0.1555 | 0.0917 | 0.0126 | 0.0129 |
| 10 13 | 1 | 0.7536 | 0.0649 | 0.0658 | 0.0305 | 0.0230 | 0.0339 |
| 11 14 | 1 | 0.4963 | 0.0716 | 0.2539 | 0.0573 | 0.0287 | 0.0330 |
| 12 15 | 3 | 0.0400 | 0.0493 | 0.6779 | 0.1760 | 0.0156 | 0.0127 |
| 13 19 | 5 | 0.0146 | 0.0198 | 0.0202 | 0.0244 | 0.7443 | 0.1550 |
| 14 20 | 4 | 0.0404 | 0.1351 | 0.2180 | 0.5498 | 0.0164 | 0.0139 |
| 15 21 | 6 | 0.0144 | 0.0138 | 0.0116 | 0.0103 | 0.0690 | 0.8712 |
| 16 22 | 4 | 0.0200 | 0.0524 | 0.1467 | 0.7447 | 0.0107 | 0.0084 |
| 17 26 | 6 | 0.0143 | 0.0153 | 0.0162 | 0.0156 | 0.4449 | 0.4795 |
| 18 27 | 7 | 0.1125 | 0.1067 | 0.1223 | 0.1206 | 0.1154 | 0.1086 |
| 19 29 | 3 | 0.0796 | 0.0579 | 0.3797 | 0.1484 | 0.0380 | 0.0303 |
| 20 31 | 6 | 0.0130 | 0.0146 | 0.0145 | 0.0144 | 0.3913 | 0.5390 |
| 21 32 | 5 | 0.0149 | 0.0188 | 0.0240 | 0.0295 | 0.7885 | 0.0907 |
| 22 34 | 2 | 0.0406 | 0.7478 | 0.0965 | 0.0855 | 0.0099 | 0.0099 |
| 23 35 | 6 | 0.1169 | 0.0656 | 0.0696 | 0.0494 | 0.1582 | 0.4763 |
| 24 36 | 7 | 0.0451 | 0.0387 | 0.0922 | 0.0822 | 0.0540 | 0.0380 |
| 25 37 | 3 | 0.0465 | 0.0817 | 0.5663 | 0.2537 | 0.0135 | 0.0117 |
| 26 38 | 4 | 0.0284 | 0.1413 | 0.1273 | 0.6577 | 0.0151 | 0.0125 |
| 27 39 | 4 | 0.0424 | 0.0600 | 0.2426 | 0.4977 | 0.0377 | 0.0256 |
| 28 40 | 1 | 0.4903 | 0.2512 | 0.0947 | 0.0553 | 0.0321 | 0.0461 |
| 29 41 | 3 | 0.1202 | 0.0578 | 0.6530 | 0.0784 | 0.0231 | 0.0219 |
| 30 42 | 1 | 0.4708 | 0.3188 | 0.0983 | 0.0461 | 0.0201 | 0.0270 |
| 31 43 | 8 | 0.0193 | 0.0249 | 0.0319 | 0.0463 | 0.0941 | 0.0436 |
| 32 46 | 2 | 0.0494 | 0.6940 | 0.0767 | 0.1219 | 0.0195 | 0.0194 |
| 33 47 | 1 | 0.7892 | 0.0541 | 0.0754 | 0.0263 | 0.0141 | 0.0183 |
| 34 49 | 3 | 0.0446 | 0.0385 | 0.7911 | 0.0806 | 0.0110 | 0.0097 |
| 35 52 | 4 | 0.0368 | 0.0965 | 0.3457 | 0.4741 | 0.0139 | 0.0117 |
| 36 54 | 2 | 0.0473 | 0.8026 | 0.0498 | 0.0576 | 0.0141 | 0.0154 |
| 37 55 | 2 | 0.0593 | 0.8261 | 0.0468 | 0.0351 | 0.0110 | 0.0133 |
| 38 56 | 1 | 0.5514 | 0.0984 | 0.1070 | 0.0560 | 0.0490 | 0.0715 |
| 39 58 | 2 | 0.0398 | 0.8219 | 0.0459 | 0.0554 | 0.0123 | 0.0132 |
| 40 60 | 4 | 0.0146 | 0.0375 | 0.0691 | 0.8417 | 0.0112 | 0.0082 |
| 41 61 | 7 | 0.0717 | 0.0553 | 0.0971 | 0.0791 | 0.0553 | 0.0483 |
| 42 63 | 7 | 0.0608 | 0.0556 | 0.0967 | 0.0938 | 0.0646 | 0.0507 |
| 43 64 | 5 | 0.0058 | 0.0064 | 0.0073 | 0.0076 | 0.8613 | 0.1023 |
| 44 65 | 4 | 0.0281 | 0.0496 | 0.2024 | 0.6441 | 0.0228 | 0.0159 |

## Fuzzy Clustering Report

Page/Date/Time 45 4/14/2005 11:44:58 PM
Database
Variables StdFactor1MulSqrtEV1, StdFactor2MulSqrtEV2, StdFactor3MulSqrtEV3
Distance Type Euclidean
Scale Type None

**Membership Matrix Section**

| Row | Cluster | Prob in 1 | Prob in 2 | Prob in 3 | Prob in 4 | Prob in 5 | Prob in 6 |
|---|---|---|---|---|---|---|---|
| 45 67 | 6 | 0.0325 | 0.0245 | 0.0226 | 0.0178 | 0.0889 | 0.7946 |
| 46 68 | 3 | 0.1720 | 0.0696 | 0.6382 | 0.0615 | 0.0148 | 0.0152 |
| 47 71 | 5 | 0.0505 | 0.0369 | 0.0554 | 0.0415 | 0.3877 | 0.3695 |
| 48 72 | 1 | 0.6244 | 0.0797 | 0.1030 | 0.0469 | 0.0369 | 0.0514 |
| 49 73 | 2 | 0.0539 | 0.8147 | 0.0452 | 0.0446 | 0.0138 | 0.0161 |
| 50 74 | 8 | 0.0824 | 0.1115 | 0.1052 | 0.1413 | 0.1333 | 0.1083 |
| 51 75 | 3 | 0.0647 | 0.0998 | 0.6431 | 0.1450 | 0.0126 | 0.0117 |
| 52 77 | 8 | 0.0349 | 0.0345 | 0.0602 | 0.0657 | 0.0916 | 0.0531 |
| 53 80 | 3 | 0.0480 | 0.0590 | 0.4613 | 0.3173 | 0.0247 | 0.0190 |
| 54 82 | 5 | 0.0241 | 0.0327 | 0.0279 | 0.0328 | 0.5130 | 0.3360 |
| 55 83 | 2 | 0.0496 | 0.4056 | 0.1923 | 0.3006 | 0.0177 | 0.0161 |
| 56 84 | 4 | 0.0534 | 0.0767 | 0.1483 | 0.3157 | 0.0810 | 0.0500 |
| 57 85 | 5 | 0.0148 | 0.0143 | 0.0192 | 0.0184 | 0.7597 | 0.1436 |
| 58 86 | 4 | 0.0278 | 0.0728 | 0.0979 | 0.6966 | 0.0409 | 0.0257 |
| 59 87 | 1 | 0.7120 | 0.0870 | 0.0718 | 0.0354 | 0.0259 | 0.0384 |
| 60 89 | 8 | 0.0498 | 0.0815 | 0.0797 | 0.1409 | 0.2144 | 0.1105 |
| 61 90 | 6 | 0.0082 | 0.0086 | 0.0081 | 0.0077 | 0.1374 | 0.8224 |
| 62 91 | 7 | 0.0233 | 0.0143 | 0.0440 | 0.0236 | 0.0113 | 0.0098 |
| 63 92 | 8 | 0.0555 | 0.0532 | 0.0812 | 0.0845 | 0.0906 | 0.0666 |
| 64 93 | 1 | 0.8121 | 0.0598 | 0.0521 | 0.0224 | 0.0149 | 0.0218 |
| 65 95 | 2 | 0.0712 | 0.8099 | 0.0486 | 0.0367 | 0.0108 | 0.0129 |
| 66 97 | 4 | 0.0363 | 0.0922 | 0.1198 | 0.6014 | 0.0636 | 0.0382 |
| 67 98 | 2 | 0.0327 | 0.7766 | 0.0615 | 0.0948 | 0.0119 | 0.0117 |
| 68 99 | 3 | 0.3106 | 0.1300 | 0.4251 | 0.0700 | 0.0168 | 0.0183 |
| 69 101 | 5 | 0.0425 | 0.0370 | 0.0564 | 0.0514 | 0.4927 | 0.1975 |
| 70 102 | 5 | 0.0519 | 0.0870 | 0.0772 | 0.1305 | 0.2984 | 0.1473 |
| 71 103 | 2 | 0.0583 | 0.4444 | 0.2220 | 0.2227 | 0.0180 | 0.0169 |
| 72 104 | 6 | 0.0158 | 0.0167 | 0.0136 | 0.0128 | 0.1006 | 0.8285 |
| 73 105 | 8 | 0.0147 | 0.0188 | 0.0238 | 0.0343 | 0.0428 | 0.0249 |
| 74 107 | 1 | 0.5832 | 0.1169 | 0.1845 | 0.0457 | 0.0211 | 0.0269 |
| 75 110 | 5 | 0.0238 | 0.0250 | 0.0381 | 0.0395 | 0.6958 | 0.1209 |
| 76 113 | 2 | 0.1654 | 0.4982 | 0.2030 | 0.0778 | 0.0181 | 0.0204 |
| 77 114 | 2 | 0.0797 | 0.5299 | 0.0990 | 0.1629 | 0.0440 | 0.0442 |
| 78 115 | 1 | 0.4540 | 0.1082 | 0.2752 | 0.0607 | 0.0313 | 0.0385 |
| 79 117 | 1 | 0.3257 | 0.3150 | 0.2290 | 0.0670 | 0.0197 | 0.0233 |
| 80 118 | 5 | 0.0088 | 0.0112 | 0.0120 | 0.0145 | 0.8447 | 0.0903 |
| 81 120 | 8 | 0.0259 | 0.0310 | 0.0445 | 0.0600 | 0.1643 | 0.0640 |
| 82 121 | 5 | 0.0095 | 0.0096 | 0.0119 | 0.0115 | 0.7961 | 0.1460 |
| 83 122 | 6 | 0.0196 | 0.0157 | 0.0144 | 0.0116 | 0.0672 | 0.8595 |
| 84 124 | 4 | 0.0904 | 0.2159 | 0.1296 | 0.2486 | 0.1001 | 0.0845 |
| 85 125 | 6 | 0.0392 | 0.0278 | 0.0266 | 0.0203 | 0.0968 | 0.7674 |
| 86 126 | 2 | 0.0329 | 0.8444 | 0.0395 | 0.0505 | 0.0111 | 0.0119 |
| 87 127 | 5 | 0.0363 | 0.0548 | 0.0422 | 0.0538 | 0.4468 | 0.3157 |
| 88 128 | 8 | 0.0139 | 0.0156 | 0.0214 | 0.0269 | 0.0360 | 0.0223 |

## Fuzzy Clustering Report

| | |
|---|---|
| Page/Date/Time | 46 4/14/2005 11:44:58 PM |
| Database | |
| Variables | StdFactor1MulSqrtEV1, StdFactor2MulSqrtEV2, StdFactor3MulSqrtEV3 |
| Distance Type | Euclidean |
| Scale Type | None |

**Membership Matrix Section**

| Row | Cluster | Prob in 1 | Prob in 2 | Prob in 3 | Prob in 4 | Prob in 5 | Prob in 6 |
|---|---|---|---|---|---|---|---|
| 89 129 | 4 | 0.0590 | 0.2352 | 0.1263 | 0.4409 | 0.0447 | 0.0368 |
| 90 130 | 7 | 0.0267 | 0.0176 | 0.0431 | 0.0275 | 0.0162 | 0.0140 |
| 91 131 | 5 | 0.0927 | 0.0629 | 0.1336 | 0.0909 | 0.2414 | 0.1681 |
| 92 132 | 1 | 0.5469 | 0.2358 | 0.0875 | 0.0458 | 0.0251 | 0.0358 |
| 93 133 | 5 | 0.0132 | 0.0154 | 0.0146 | 0.0155 | 0.5017 | 0.4222 |
| 94 134 | 7 | 0.0799 | 0.0767 | 0.1090 | 0.1107 | 0.0893 | 0.0740 |
| 95 135 | 2 | 0.0704 | 0.5595 | 0.1990 | 0.1250 | 0.0155 | 0.0155 |
| 96 136 | 6 | 0.0470 | 0.0360 | 0.0462 | 0.0379 | 0.3393 | 0.4269 |
| 97 138 | 6 | 0.0398 | 0.0306 | 0.0403 | 0.0299 | 0.2851 | 0.5425 |
| 98 139 | 2 | 0.2949 | 0.4680 | 0.0903 | 0.0569 | 0.0280 | 0.0386 |
| 99 140 | 2 | 0.0453 | 0.6909 | 0.1161 | 0.1131 | 0.0116 | 0.0114 |
| 100 141 | 7 | 0.0525 | 0.0294 | 0.1051 | 0.0462 | 0.0197 | 0.0178 |
| 101 142 | 7 | 0.0494 | 0.0431 | 0.0829 | 0.0755 | 0.0564 | 0.0429 |
| 102 143 | 1 | 0.4520 | 0.0812 | 0.2098 | 0.0658 | 0.0366 | 0.0426 |
| 103 144 | 8 | 0.0552 | 0.0829 | 0.0812 | 0.1306 | 0.1377 | 0.0906 |
| 104 146 | 7 | 0.0326 | 0.0239 | 0.0833 | 0.0496 | 0.0226 | 0.0177 |
| 105 147 | 2 | 0.0675 | 0.6395 | 0.1078 | 0.1124 | 0.0272 | 0.0283 |
| 106 148 | 5 | 0.0056 | 0.0063 | 0.0071 | 0.0077 | 0.8805 | 0.0825 |
| 107 149 | 2 | 0.0304 | 0.8406 | 0.0531 | 0.0531 | 0.0078 | 0.0080 |
| 108 150 | 2 | 0.1298 | 0.6503 | 0.0739 | 0.0643 | 0.0263 | 0.0329 |
| 109 151 | 2 | 0.0770 | 0.8040 | 0.0501 | 0.0349 | 0.0112 | 0.0137 |
| 110 152 | 6 | 0.0085 | 0.0078 | 0.0070 | 0.0060 | 0.0496 | 0.9153 |
| 111 153 | 6 | 0.0070 | 0.0066 | 0.0064 | 0.0058 | 0.0782 | 0.8897 |
| 112 154 | 5 | 0.0161 | 0.0176 | 0.0231 | 0.0257 | 0.7607 | 0.1045 |
| 113 155 | 6 | 0.0367 | 0.0263 | 0.0326 | 0.0242 | 0.2041 | 0.6469 |
| 114 156 | 5 | 0.0407 | 0.0642 | 0.0644 | 0.1072 | 0.4007 | 0.1386 |
| 115 158 | 3 | 0.2426 | 0.0663 | 0.5203 | 0.0649 | 0.0224 | 0.0235 |
| 116 159 | 5 | 0.0201 | 0.0261 | 0.0224 | 0.0259 | 0.5120 | 0.3669 |
| 117 161 | 7 | 0.1819 | 0.0703 | 0.1747 | 0.0773 | 0.0541 | 0.0566 |
| 118 163 | 4 | 0.0270 | 0.0519 | 0.1191 | 0.7059 | 0.0260 | 0.0178 |
| 119 164 | 3 | 0.2349 | 0.1827 | 0.4451 | 0.0789 | 0.0164 | 0.0178 |
| 120 165 | 8 | 0.0098 | 0.0110 | 0.0154 | 0.0192 | 0.0312 | 0.0178 |
| 121 168 | 4 | 0.0238 | 0.0622 | 0.0864 | 0.7618 | 0.0190 | 0.0141 |
| 122 171 | 4 | 0.0333 | 0.1964 | 0.0999 | 0.6044 | 0.0240 | 0.0193 |
| 123 172 | 3 | 0.0569 | 0.0475 | 0.6973 | 0.1096 | 0.0222 | 0.0185 |

## Fuzzy Clustering Report

| | |
|---|---|
| Page/Date/Time | 47 4/14/2005 11:44:58 PM |
| Database | |
| Variables | StdFactor1MulSqrtEV1, StdFactor2MulSqrtEV2, StdFactor3MulSqrtEV3 |
| Distance Type | Euclidean |
| Scale Type | None |

**Membership Matrix Section**

| Row | Cluster | Prob in 7 | Prob in 8 |
|---|---|---|---|
| 1 1 | 3 | 0.0530 | 0.0110 |
| 2 2 | 3 | 0.0545 | 0.0101 |
| 3 3 | 4 | 0.0086 | 0.0081 |
| 4 4 | 2 | 0.0088 | 0.0053 |
| 5 6 | 6 | 0.0033 | 0.0052 |
| 6 7 | 1 | 0.0182 | 0.0059 |
| 7 10 | 1 | 0.0116 | 0.0062 |
| 8 11 | 7 | 0.7508 | 0.0149 |
| 9 12 | 2 | 0.0077 | 0.0046 |
| 10 13 | 1 | 0.0199 | 0.0084 |
| 11 14 | 1 | 0.0477 | 0.0114 |
| 12 15 | 3 | 0.0208 | 0.0076 |
| 13 19 | 5 | 0.0069 | 0.0148 |
| 14 20 | 4 | 0.0167 | 0.0096 |
| 15 21 | 6 | 0.0042 | 0.0056 |
| 16 22 | 4 | 0.0106 | 0.0063 |
| 17 26 | 6 | 0.0056 | 0.0087 |
| 18 27 | 7 | 0.1640 | 0.1500 |
| 19 29 | 3 | 0.2391 | 0.0270 |
| 20 31 | 6 | 0.0050 | 0.0082 |
| 21 32 | 5 | 0.0094 | 0.0241 |
| 22 34 | 2 | 0.0059 | 0.0038 |
| 23 35 | 6 | 0.0339 | 0.0301 |
| 24 36 | 7 | 0.5463 | 0.1035 |
| 25 37 | 3 | 0.0192 | 0.0074 |
| 26 38 | 4 | 0.0101 | 0.0075 |
| 27 39 | 4 | 0.0621 | 0.0319 |
| 28 40 | 1 | 0.0190 | 0.0113 |
| 29 41 | 3 | 0.0362 | 0.0094 |
| 30 42 | 1 | 0.0121 | 0.0067 |
| 31 43 | 8 | 0.0241 | 0.7158 |
| 32 46 | 2 | 0.0105 | 0.0087 |
| 33 47 | 1 | 0.0169 | 0.0057 |
| 34 49 | 3 | 0.0192 | 0.0054 |
| 35 52 | 4 | 0.0142 | 0.0072 |
| 36 54 | 2 | 0.0073 | 0.0058 |
| 37 55 | 2 | 0.0049 | 0.0035 |
| 38 56 | 1 | 0.0467 | 0.0200 |
| 39 58 | 2 | 0.0064 | 0.0050 |
| 40 60 | 4 | 0.0100 | 0.0077 |
| 41 61 | 7 | 0.5134 | 0.0798 |
| 42 63 | 7 | 0.4243 | 0.1536 |
| 43 64 | 5 | 0.0030 | 0.0063 |
| 44 65 | 4 | 0.0232 | 0.0139 |

## Fuzzy Clustering Report

| | |
|---|---|
| Page/Date/Time | 48 4/14/2005 11:44:58 PM |
| Database | |
| Variables | StdFactor1MulSqrtEV1, StdFactor2MulSqrtEV2, StdFactor3MulSqrtEV3 |
| Distance Type | Euclidean |
| Scale Type | None |

**Membership Matrix Section**

| Row | Cluster | Prob in 7 | Prob in 8 |
|---|---|---|---|
| 45 67 | 6 | 0.0089 | 0.0102 |
| 46 68 | 3 | 0.0224 | 0.0063 |
| 47 71 | 5 | 0.0276 | 0.0309 |
| 48 72 | 1 | 0.0423 | 0.0153 |
| 49 73 | 2 | 0.0066 | 0.0051 |
| 50 74 | 8 | 0.0811 | 0.2370 |
| 51 75 | 3 | 0.0170 | 0.0062 |
| 52 77 | 8 | 0.1042 | 0.5558 |
| 53 80 | 3 | 0.0540 | 0.0166 |
| 54 82 | 5 | 0.0104 | 0.0231 |
| 55 83 | 2 | 0.0110 | 0.0072 |
| 56 84 | 4 | 0.1100 | 0.1648 |
| 57 85 | 5 | 0.0098 | 0.0202 |
| 58 86 | 4 | 0.0171 | 0.0212 |
| 59 87 | 1 | 0.0201 | 0.0096 |
| 60 89 | 8 | 0.0416 | 0.2818 |
| 61 90 | 6 | 0.0030 | 0.0047 |
| 62 91 | 7 | 0.8632 | 0.0106 |
| 63 92 | 8 | 0.1891 | 0.3792 |
| 64 93 | 1 | 0.0115 | 0.0052 |
| 65 95 | 2 | 0.0060 | 0.0040 |
| 66 97 | 4 | 0.0210 | 0.0274 |
| 67 98 | 2 | 0.0061 | 0.0047 |
| 68 99 | 3 | 0.0221 | 0.0072 |
| 69 101 | 5 | 0.0407 | 0.0817 |
| 70 102 | 5 | 0.0356 | 0.1719 |
| 71 103 | 2 | 0.0110 | 0.0068 |
| 72 104 | 6 | 0.0049 | 0.0071 |
| 73 105 | 8 | 0.0229 | 0.8179 |
| 74 107 | 1 | 0.0152 | 0.0065 |
| 75 110 | 5 | 0.0185 | 0.0384 |
| 76 113 | 2 | 0.0112 | 0.0060 |
| 77 114 | 2 | 0.0201 | 0.0201 |
| 78 115 | 1 | 0.0228 | 0.0092 |
| 79 117 | 1 | 0.0137 | 0.0066 |
| 80 118 | 5 | 0.0050 | 0.0134 |
| 81 120 | 8 | 0.0362 | 0.5740 |
| 82 121 | 5 | 0.0053 | 0.0100 |
| 83 122 | 6 | 0.0055 | 0.0065 |
| 84 124 | 4 | 0.0500 | 0.0809 |
| 85 125 | 6 | 0.0106 | 0.0114 |
| 86 126 | 2 | 0.0053 | 0.0043 |
| 87 127 | 5 | 0.0154 | 0.0350 |
| 88 128 | 8 | 0.0278 | 0.8361 |

## Fuzzy Clustering Report

| | |
|---|---|
| Page/Date/Time | 49 4/14/2005 11:44:58 PM |
| Database | |
| Variables | StdFactor1MulSqrtEV1, StdFactor2MulSqrtEV2, StdFactor3MulSqrtEV3 |
| Distance Type | Euclidean |
| Scale Type | None |

**Membership Matrix Section**

| Row | Cluster | Prob in 7 | Prob in 8 |
|---|---|---|---|
| 89 129 | 4 | 0.0277 | 0.0293 |
| 90 130 | 7 | 0.8368 | 0.0180 |
| 91 131 | 5 | 0.1246 | 0.0857 |
| 92 132 | 1 | 0.0147 | 0.0084 |
| 93 133 | 5 | 0.0058 | 0.0116 |
| 94 134 | 7 | 0.2588 | 0.2015 |
| 95 135 | 2 | 0.0096 | 0.0056 |
| 96 136 | 6 | 0.0277 | 0.0391 |
| 97 138 | 6 | 0.0152 | 0.0165 |
| 98 139 | 2 | 0.0141 | 0.0092 |
| 99 140 | 2 | 0.0072 | 0.0045 |
| 100 141 | 7 | 0.7135 | 0.0160 |
| 101 142 | 7 | 0.5188 | 0.1310 |
| 102 143 | 1 | 0.0938 | 0.0182 |
| 103 144 | 8 | 0.0558 | 0.3661 |
| 104 146 | 7 | 0.7470 | 0.0233 |
| 105 147 | 2 | 0.0097 | 0.0076 |
| 106 148 | 5 | 0.0031 | 0.0072 |
| 107 149 | 2 | 0.0041 | 0.0028 |
| 108 150 | 2 | 0.0128 | 0.0096 |
| 109 151 | 2 | 0.0055 | 0.0037 |
| 110 152 | 6 | 0.0025 | 0.0034 |
| 111 153 | 6 | 0.0025 | 0.0037 |
| 112 154 | 5 | 0.0127 | 0.0394 |
| 113 155 | 6 | 0.0139 | 0.0153 |
| 114 156 | 5 | 0.0300 | 0.1543 |
| 115 158 | 3 | 0.0498 | 0.0102 |
| 116 159 | 5 | 0.0086 | 0.0182 |
| 117 161 | 7 | 0.3499 | 0.0352 |
| 118 163 | 4 | 0.0298 | 0.0225 |
| 119 164 | 3 | 0.0175 | 0.0067 |
| 120 165 | 8 | 0.0189 | 0.8767 |
| 121 168 | 4 | 0.0179 | 0.0148 |
| 122 171 | 4 | 0.0119 | 0.0108 |
| 123 172 | 3 | 0.0375 | 0.0104 |

**Summary Section**

| Number Clusters | Average Distance | Average Silhouette | F(U) | Fc(U) | D(U) | Dc(U) |
|---|---|---|---|---|---|---|
| 2 | 50.979731 | 0.359210 | 0.7129 | 0.4257 | 0.1027 | 0.2054 |
| 3 | 40.771891 | 0.333427 | 0.5981 | 0.3971 | 0.1786 | 0.2679 |
| 4 | 34.676136 | 0.279642 | 0.5446 | 0.3928 | 0.1993 | 0.2657 |
| 5 | 30.652115 | 0.306873 | 0.5147 | 0.3934 | 0.2068 | 0.2585 |
| 6 | 28.051036 | 0.216755 | 0.4339 | 0.3207 | 0.2855 | 0.3426 |

# Appendix A 5-2a

**Fuzzy Clustering Report**

| | |
|---|---|
| Page/Date/Time | 50 4/14/2005 11:44:58 PM |
| Database | |
| Variables | StdFactor1MulSqrtEV1, StdFactor2MulSqrtEV2, StdFactor3MulSqrtEV3 |
| Distance Type | Euclidean |
| Scale Type | None |

**Summary Section**

| Number Clusters | Average Distance | Average Silhouette | F(U) | Fc(U) | D(U) | Dc(U) |
|---|---|---|---|---|---|---|
| 7 | 25.449204 | 0.306609 | 0.4603 | 0.3704 | 0.2291 | 0.2673 |
| 8 | 23.367788 | 0.250222 | 0.4612 | 0.3842 | 0.2322 | 0.2654 |

# Appendix A5-2b

**Fuzzy Clustering Report**

| | |
|---|---|
| Page/Date/Time | 1 4/14/2005 11:47:56 PM |
| Database | |
| Variables | StdFactor1MultSqrtEV1, StdFactor2MultSqrtEV2, StdFactor3MultSqrtEV3 |
| Distance Type | Euclidean |
| Scale Type | None |

**Cluster Medoids Section**

| Variable | Cluster1 | Cluster2 |
|---|---|---|
| StdFactor1MultSqrtEV1 | -0.6982105 | -0.4171036 |
| StdFactor2MultSqrtEV2 | -0.6550642 | 1.267338 |
| StdFactor3MultSqrtEV3 | -4.361453E-03 | 2.610668E-02 |
| Row | 38 116 | 4 16 |

**Membership Summary Section for Clusters = 2**

<table>
<tr><th>Row</th><th>Cluster</th><th>Cluster Membership</th><th>Sum of Squared Memberships</th><th>Bar of Squared Memberships</th><th>Silhouette Amount</th><th>Silhouette Bar</th></tr>
<tr><td>38 116</td><td>1</td><td>0.9217</td><td>0.8556</td><td>|||||||||||||||||||||||||||</td><td>0.5511</td><td>||||||||||||||||||</td></tr>
<tr><td>28 81</td><td>1</td><td>0.9206</td><td>0.8538</td><td>|||||||||||||||||||||||||||</td><td>0.5684</td><td>||||||||||||||||||</td></tr>
<tr><td>41 137</td><td>1</td><td>0.9111</td><td>0.8381</td><td>||||||||||||||||||||||||||</td><td>0.5439</td><td>|||||||||||||||||</td></tr>
<tr><td>2 8</td><td>1</td><td>0.9105</td><td>0.8370</td><td>||||||||||||||||||||||||||</td><td>0.5511</td><td>||||||||||||||||||</td></tr>
<tr><td>27 79</td><td>1</td><td>0.9091</td><td>0.8347</td><td>||||||||||||||||||||||||||</td><td>0.5345</td><td>|||||||||||||||||</td></tr>
<tr><td>45 162</td><td>1</td><td>0.9002</td><td>0.8204</td><td>||||||||||||||||||||||||||</td><td>0.5293</td><td>|||||||||||||||||</td></tr>
<tr><td>21 62</td><td>1</td><td>0.9000</td><td>0.8199</td><td>||||||||||||||||||||||||||</td><td>0.5422</td><td>|||||||||||||||||</td></tr>
<tr><td>31 96</td><td>1</td><td>0.8996</td><td>0.8194</td><td>||||||||||||||||||||||||||</td><td>0.5452</td><td>|||||||||||||||||</td></tr>
<tr><td>12 33</td><td>1</td><td>0.8947</td><td>0.8115</td><td>|||||||||||||||||||||||||</td><td>0.5272</td><td>|||||||||||||||||</td></tr>
<tr><td>6 18</td><td>1</td><td>0.8853</td><td>0.7969</td><td>|||||||||||||||||||||||||</td><td>0.5365</td><td>|||||||||||||||||</td></tr>
<tr><td>40 123</td><td>1</td><td>0.8790</td><td>0.7873</td><td>|||||||||||||||||||||||||</td><td>0.5010</td><td>||||||||||||||||</td></tr>
<tr><td>8 24</td><td>1</td><td>0.8713</td><td>0.7757</td><td>||||||||||||||||||||||||</td><td>0.5223</td><td>|||||||||||||||||</td></tr>
<tr><td>5 17</td><td>1</td><td>0.8576</td><td>0.7557</td><td>||||||||||||||||||||||||</td><td>0.5054</td><td>||||||||||||||||</td></tr>
<tr><td>3 9</td><td>1</td><td>0.8564</td><td>0.7541</td><td>||||||||||||||||||||||||</td><td>0.5121</td><td>||||||||||||||||</td></tr>
<tr><td>9 25</td><td>1</td><td>0.8554</td><td>0.7526</td><td>||||||||||||||||||||||||</td><td>0.4967</td><td>||||||||||||||||</td></tr>
<tr><td>48 169</td><td>1</td><td>0.8502</td><td>0.7452</td><td>|||||||||||||||||||||||</td><td>0.4828</td><td>|||||||||||||||</td></tr>
<tr><td>42 145</td><td>1</td><td>0.8335</td><td>0.7224</td><td>|||||||||||||||||||||||</td><td>0.4777</td><td>|||||||||||||||</td></tr>
<tr><td>1 5</td><td>1</td><td>0.8140</td><td>0.6972</td><td>||||||||||||||||||||||</td><td>0.4477</td><td>||||||||||||||</td></tr>
<tr><td>32 100</td><td>1</td><td>0.8056</td><td>0.6868</td><td>||||||||||||||||||||||</td><td>0.4654</td><td>|||||||||||||||</td></tr>
<tr><td>17 51</td><td>1</td><td>0.7870</td><td>0.6648</td><td>|||||||||||||||||||||</td><td>0.4510</td><td>|||||||||||||||</td></tr>
<tr><td>13 44</td><td>1</td><td>0.7784</td><td>0.6550</td><td>|||||||||||||||||||||</td><td>0.4393</td><td>||||||||||||||</td></tr>
<tr><td>37 112</td><td>1</td><td>0.7724</td><td>0.6484</td><td>||||||||||||||||||||</td><td>0.4349</td><td>||||||||||||||</td></tr>
<tr><td>14 45</td><td>1</td><td>0.7654</td><td>0.6409</td><td>||||||||||||||||||||</td><td>0.4156</td><td>|||||||||||||</td></tr>
<tr><td>36 111</td><td>1</td><td>0.7643</td><td>0.6397</td><td>||||||||||||||||||||</td><td>0.4201</td><td>||||||||||||||</td></tr>
<tr><td>10 28</td><td>1</td><td>0.6798</td><td>0.5646</td><td>||||||||||||||||||</td><td>0.3316</td><td>|||||||||||</td></tr>
<tr><td>20 59</td><td>1</td><td>0.6050</td><td>0.5220</td><td>|||||||||||||||||</td><td>0.2384</td><td>||||||||</td></tr>
<tr><td>33 106</td><td>1</td><td>0.5471</td><td>0.5044</td><td>||||||||||||||||</td><td>0.1850</td><td>|||||||</td></tr>
<tr><td>22 66</td><td>1</td><td>0.5342</td><td>0.5023</td><td>||||||||||||||||</td><td>0.0707</td><td>|||</td></tr>
<tr><td>4 16</td><td>2</td><td>0.9294</td><td>0.8687</td><td>|||||||||||||||||||||||||||</td><td>0.2572</td><td>|||||||||</td></tr>
<tr><td>7 23</td><td>2</td><td>0.9227</td><td>0.8573</td><td>|||||||||||||||||||||||||||</td><td>0.2897</td><td>||||||||||</td></tr>
<tr><td>47 167</td><td>2</td><td>0.9150</td><td>0.8444</td><td>||||||||||||||||||||||||||</td><td>0.2296</td><td>||||||||</td></tr>
<tr><td>18 53</td><td>2</td><td>0.9023</td><td>0.8238</td><td>||||||||||||||||||||||||||</td><td>0.2009</td><td>|||||||</td></tr>
<tr><td>35 109</td><td>2</td><td>0.8945</td><td>0.8112</td><td>|||||||||||||||||||||||||</td><td>0.2466</td><td>||||||||</td></tr>
<tr><td>30 94</td><td>2</td><td>0.8796</td><td>0.7882</td><td>|||||||||||||||||||||||||</td><td>0.2198</td><td>||||||||</td></tr>
<tr><td>34 108</td><td>2</td><td>0.8772</td><td>0.7845</td><td>|||||||||||||||||||||||||</td><td>0.2290</td><td>||||||||</td></tr>
</table>

## Fuzzy Clustering Report

| | |
|---|---|
| Page/Date/Time | 2 4/14/2005 11:47:56 PM |
| Database | |
| Variables | StdFactor1MultSqrtEV1, StdFactor2MultSqrtEV2, StdFactor3MultSqrtEV3 |
| Distance Type | Euclidean |
| Scale Type | None |

**Membership Summary Section for Clusters = 2**

<table>
<tr><th>Row</th><th>Cluster</th><th>Cluster Membership</th><th>Sum of Squared Memberships</th><th>Bar of Squared Memberships</th><th>Silhouette Amount</th><th>Silhouette Bar</th></tr>
<tr><td>44 160</td><td>2</td><td>0.8662</td><td>0.7682</td><td>|IIIIIIIIIIIIIIIIIIIIIII</td><td>0.1891</td><td>|IIIIII</td></tr>
<tr><td>46 166</td><td>2</td><td>0.8619</td><td>0.7620</td><td>|IIIIIIIIIIIIIIIIIIIIIII</td><td>0.2123</td><td>|IIIIII</td></tr>
<tr><td>25 76</td><td>2</td><td>0.8380</td><td>0.7285</td><td>|IIIIIIIIIIIIIIIIIIIIII</td><td>0.1557</td><td>|IIIII</td></tr>
<tr><td>39 119</td><td>2</td><td>0.8316</td><td>0.7199</td><td>|IIIIIIIIIIIIIIIIIIIIII</td><td>0.1613</td><td>|IIIII</td></tr>
<tr><td>19 57</td><td>2</td><td>0.8212</td><td>0.7063</td><td>|IIIIIIIIIIIIIIIIIIIII</td><td>0.2072</td><td>|IIIIII</td></tr>
<tr><td>23 69</td><td>2</td><td>0.8154</td><td>0.6990</td><td>|IIIIIIIIIIIIIIIIIIIII</td><td>0.2582</td><td>|IIIIIIII</td></tr>
<tr><td>49 170</td><td>2</td><td>0.7935</td><td>0.6723</td><td>|IIIIIIIIIIIIIIIIIIII</td><td>0.1059</td><td>|III</td></tr>
<tr><td>24 70</td><td>2</td><td>0.7564</td><td>0.6315</td><td>|IIIIIIIIIIIIIIIIIII</td><td>0.0626</td><td>|II</td></tr>
<tr><td>16 50</td><td>2</td><td>0.7338</td><td>0.6093</td><td>|IIIIIIIIIIIIIIIIII</td><td>0.0533</td><td>|II</td></tr>
<tr><td>15 48</td><td>2</td><td>0.6720</td><td>0.5592</td><td>|IIIIIIIIIIIIIIIII</td><td>0.0961</td><td>|III</td></tr>
<tr><td>29 88</td><td>2</td><td>0.6419</td><td>0.5403</td><td>|IIIIIIIIIIIIIIII</td><td>0.0547</td><td>|II</td></tr>
<tr><td>43 157</td><td>2</td><td>0.5240</td><td>0.5012</td><td>|IIIIIIIIIIIIIII</td><td>0.0132</td><td>|</td></tr>
<tr><td>26 78</td><td>2</td><td>0.5049</td><td>0.5000</td><td>|IIIIIIIIIIIIIII</td><td>-0.1270</td><td>|</td></tr>
<tr><td>11 30</td><td>2</td><td>0.5020</td><td>0.5000</td><td>|IIIIIIIIIIIIIII</td><td>-0.0625</td><td>|</td></tr>
</table>

**Membership Matrix Section**

| Row | Cluster | Prob in 1 | Prob in 2 |
|---|---|---|---|
| 1 5 | 1 | 0.8140 | 0.1860 |
| 2 8 | 1 | 0.9105 | 0.0895 |
| 3 9 | 1 | 0.8564 | 0.1436 |
| 4 16 | 2 | 0.0706 | 0.9294 |
| 5 17 | 1 | 0.8576 | 0.1424 |
| 6 18 | 1 | 0.8853 | 0.1147 |
| 7 23 | 2 | 0.0773 | 0.9227 |
| 8 24 | 1 | 0.8713 | 0.1287 |
| 9 25 | 1 | 0.8554 | 0.1446 |
| 10 28 | 1 | 0.6798 | 0.3202 |
| 11 30 | 2 | 0.4980 | 0.5020 |
| 12 33 | 1 | 0.8947 | 0.1053 |
| 13 44 | 1 | 0.7784 | 0.2216 |
| 14 45 | 1 | 0.7654 | 0.2346 |
| 15 48 | 2 | 0.3280 | 0.6720 |
| 16 50 | 2 | 0.2662 | 0.7338 |
| 17 51 | 1 | 0.7870 | 0.2130 |
| 18 53 | 2 | 0.0977 | 0.9023 |
| 19 57 | 2 | 0.1788 | 0.8212 |
| 20 59 | 1 | 0.6050 | 0.3950 |
| 21 62 | 1 | 0.9000 | 0.1000 |
| 22 66 | 1 | 0.5342 | 0.4658 |
| 23 69 | 2 | 0.1846 | 0.8154 |
| 24 70 | 2 | 0.2436 | 0.7564 |
| 25 76 | 2 | 0.1620 | 0.8380 |

## Fuzzy Clustering Report

| | |
|---|---|
| Page/Date/Time | 3 4/14/2005 11:47:56 PM |
| Database | |
| Variables | StdFactor1MultSqrtEV1, StdFactor2MultSqrtEV2, StdFactor3MultSqrtEV3 |
| Distance Type | Euclidean |
| Scale Type | None |

**Membership Matrix Section**

| Row | Cluster | Prob in 1 | Prob in 2 |
|---|---|---|---|
| 26 78 | 2 | 0.4951 | 0.5049 |
| 27 79 | 1 | 0.9091 | 0.0909 |
| 28 81 | 1 | 0.9206 | 0.0794 |
| 29 88 | 2 | 0.3581 | 0.6419 |
| 30 94 | 2 | 0.1204 | 0.8796 |
| 31 96 | 1 | 0.8996 | 0.1004 |
| 32 100 | 1 | 0.8056 | 0.1944 |
| 33 106 | 1 | 0.5471 | 0.4529 |
| 34 108 | 2 | 0.1228 | 0.8772 |
| 35 109 | 2 | 0.1055 | 0.8945 |
| 36 111 | 1 | 0.7643 | 0.2357 |
| 37 112 | 1 | 0.7724 | 0.2276 |
| 38 116 | 1 | 0.9217 | 0.0783 |
| 39 119 | 2 | 0.1684 | 0.8316 |
| 40 123 | 1 | 0.8790 | 0.1210 |
| 41 137 | 1 | 0.9111 | 0.0889 |
| 42 145 | 1 | 0.8335 | 0.1665 |
| 43 157 | 2 | 0.4760 | 0.5240 |
| 44 160 | 2 | 0.1338 | 0.8662 |
| 45 162 | 1 | 0.9002 | 0.0998 |
| 46 166 | 2 | 0.1381 | 0.8619 |
| 47 167 | 2 | 0.0850 | 0.9150 |
| 48 169 | 1 | 0.8502 | 0.1498 |
| 49 170 | 2 | 0.2065 | 0.7935 |

**Cluster Medoids Section**

| Variable | Cluster1 | Cluster2 | Cluster3 | |
|---|---|---|---|---|
| StdFactor1MultSqrtEV1 | | -0.6982105 | 4.386005 | -0.4171036 |
| StdFactor2MultSqrtEV2 | | -0.6550642 | -0.9627987 | 1.267338 |
| StdFactor3MultSqrtEV3 | | -4.361453E-03 | 1.013824 | 2.610668E-02 |
| Row | 38 116 | 11 30 | 4 16 | |

## Fuzzy Clustering Report

Page/Date/Time 4 4/14/2005 11:47:56 PM
Database
Variables StdFactor1MultSqrtEV1, StdFactor2MultSqrtEV2, StdFactor3MultSqrtEV3
Distance Type Euclidean
Scale Type None

**Membership Summary Section for Clusters = 3**

<table>
<tr><th>Row</th><th>Cluster</th><th>Cluster Membership</th><th>Sum of Squared Memberships</th><th>Bar of Squared Memberships</th><th>Silhouette Amount</th><th>Silhouette Bar</th></tr>
<tr><td>38 116</td><td>1</td><td>0.9391</td><td>0.8842</td><td>||||||||||||||||||||||||||||</td><td>0.5434</td><td>|||||||||||||||||</td></tr>
<tr><td>2 8</td><td>1</td><td>0.9365</td><td>0.8795</td><td>|||||||||||||||||||||||||||</td><td>0.5494</td><td>|||||||||||||||||</td></tr>
<tr><td>27 79</td><td>1</td><td>0.9265</td><td>0.8618</td><td>|||||||||||||||||||||||||||</td><td>0.5293</td><td>|||||||||||||||||</td></tr>
<tr><td>31 96</td><td>1</td><td>0.9254</td><td>0.8599</td><td>|||||||||||||||||||||||||||</td><td>0.5405</td><td>|||||||||||||||||</td></tr>
<tr><td>28 81</td><td>1</td><td>0.9238</td><td>0.8567</td><td>|||||||||||||||||||||||||||</td><td>0.5779</td><td>||||||||||||||||||</td></tr>
<tr><td>21 62</td><td>1</td><td>0.9191</td><td>0.8486</td><td>||||||||||||||||||||||||||</td><td>0.5326</td><td>|||||||||||||||||</td></tr>
<tr><td>12 33</td><td>1</td><td>0.9165</td><td>0.8443</td><td>||||||||||||||||||||||||||</td><td>0.5207</td><td>|||||||||||||||||</td></tr>
<tr><td>41 137</td><td>1</td><td>0.8847</td><td>0.7896</td><td>|||||||||||||||||||||||||</td><td>0.5360</td><td>|||||||||||||||||</td></tr>
<tr><td>8 24</td><td>1</td><td>0.8845</td><td>0.7900</td><td>|||||||||||||||||||||||||</td><td>0.5074</td><td>||||||||||||||||</td></tr>
<tr><td>5 17</td><td>1</td><td>0.8829</td><td>0.7879</td><td>|||||||||||||||||||||||||</td><td>0.4915</td><td>||||||||||||||||</td></tr>
<tr><td>45 162</td><td>1</td><td>0.8652</td><td>0.7581</td><td>||||||||||||||||||||||||</td><td>0.5183</td><td>|||||||||||||||||</td></tr>
<tr><td>3 9</td><td>1</td><td>0.8639</td><td>0.7570</td><td>||||||||||||||||||||||||</td><td>0.4951</td><td>||||||||||||||||</td></tr>
<tr><td>40 123</td><td>1</td><td>0.8409</td><td>0.7208</td><td>|||||||||||||||||||||||</td><td>0.4808</td><td>|||||||||||||||</td></tr>
<tr><td>48 169</td><td>1</td><td>0.8386</td><td>0.7188</td><td>|||||||||||||||||||||||</td><td>0.4711</td><td>|||||||||||||||</td></tr>
<tr><td>6 18</td><td>1</td><td>0.8347</td><td>0.7104</td><td>||||||||||||||||||||||</td><td>0.5270</td><td>|||||||||||||||||</td></tr>
<tr><td>42 145</td><td>1</td><td>0.8301</td><td>0.7066</td><td>||||||||||||||||||||||</td><td>0.4667</td><td>|||||||||||||||</td></tr>
<tr><td>37 112</td><td>1</td><td>0.7818</td><td>0.6424</td><td>||||||||||||||||||||</td><td>0.4039</td><td>|||||||||||||</td></tr>
<tr><td>32 100</td><td>1</td><td>0.7689</td><td>0.6202</td><td>||||||||||||||||||||</td><td>0.4354</td><td>||||||||||||||</td></tr>
<tr><td>17 51</td><td>1</td><td>0.7649</td><td>0.6165</td><td>|||||||||||||||||||</td><td>0.4168</td><td>||||||||||||||</td></tr>
<tr><td>9 25</td><td>1</td><td>0.7582</td><td>0.6042</td><td>|||||||||||||||||||</td><td>0.4946</td><td>||||||||||||||||</td></tr>
<tr><td>1 5</td><td>1</td><td>0.7349</td><td>0.5760</td><td>||||||||||||||||||</td><td>0.4279</td><td>||||||||||||||</td></tr>
<tr><td>14 45</td><td>1</td><td>0.6944</td><td>0.5308</td><td>|||||||||||||||||</td><td>0.4015</td><td>|||||||||||||</td></tr>
<tr><td>13 44</td><td>1</td><td>0.6836</td><td>0.5177</td><td>|||||||||||||||||</td><td>0.4073</td><td>|||||||||||||</td></tr>
<tr><td>36 111</td><td>1</td><td>0.4823</td><td>0.3924</td><td>|||||||||||||</td><td>0.3986</td><td>|||||||||||||</td></tr>
<tr><td>33 106</td><td>1</td><td>0.4705</td><td>0.3802</td><td>||||||||||||</td><td>0.1330</td><td>|||||</td></tr>
<tr><td>10 28</td><td>1</td><td>0.4238</td><td>0.3654</td><td>||||||||||||</td><td>0.3048</td><td>||||||||||</td></tr>
<tr><td>11 30</td><td>2</td><td>0.8755</td><td>0.7742</td><td>||||||||||||||||||||||||</td><td>0.4386</td><td>||||||||||||||</td></tr>
<tr><td>22 66</td><td>2</td><td>0.8516</td><td>0.7364</td><td>|||||||||||||||||||||||</td><td>0.3742</td><td>||||||||||||</td></tr>
<tr><td>20 59</td><td>2</td><td>0.7586</td><td>0.6063</td><td>|||||||||||||||||||</td><td>-0.2288</td><td>|</td></tr>
<tr><td>43 157</td><td>2</td><td>0.7474</td><td>0.5906</td><td>|||||||||||||||||||</td><td>0.3914</td><td>|||||||||||||</td></tr>
<tr><td>29 88</td><td>2</td><td>0.6248</td><td>0.4638</td><td>|||||||||||||||</td><td>-0.2209</td><td>|</td></tr>
<tr><td>26 78</td><td>2</td><td>0.4258</td><td>0.3464</td><td>|||||||||||</td><td>-0.3127</td><td>|</td></tr>
<tr><td>4 16</td><td>3</td><td>0.9477</td><td>0.8998</td><td>||||||||||||||||||||||||||||</td><td>0.5360</td><td>|||||||||||||||||</td></tr>
<tr><td>7 23</td><td>3</td><td>0.9429</td><td>0.8910</td><td>||||||||||||||||||||||||||||</td><td>0.5574</td><td>||||||||||||||||||</td></tr>
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<tr><td>30 94</td><td>3</td><td>0.9116</td><td>0.8360</td><td>||||||||||||||||||||||||||</td><td>0.4955</td><td>||||||||||||||||</td></tr>
<tr><td>44 160</td><td>3</td><td>0.9088</td><td>0.8315</td><td>||||||||||||||||||||||||||</td><td>0.4810</td><td>|||||||||||||||</td></tr>
<tr><td>34 108</td><td>3</td><td>0.8890</td><td>0.7977</td><td>|||||||||||||||||||||||||</td><td>0.4770</td><td>|||||||||||||||</td></tr>
<tr><td>18 53</td><td>3</td><td>0.8834</td><td>0.7880</td><td>|||||||||||||||||||||||||</td><td>0.4552</td><td>|||||||||||||||</td></tr>
<tr><td>39 119</td><td>3</td><td>0.8650</td><td>0.7605</td><td>||||||||||||||||||||||||</td><td>0.4344</td><td>||||||||||||||</td></tr>
<tr><td>25 76</td><td>3</td><td>0.8632</td><td>0.7571</td><td>||||||||||||||||||||||||</td><td>0.4406</td><td>||||||||||||||</td></tr>
<tr><td>35 109</td><td>3</td><td>0.8366</td><td>0.7138</td><td>||||||||||||||||||||||</td><td>0.4545</td><td>|||||||||||||||</td></tr>
</table>

## Fuzzy Clustering Report

Page/Date/Time 5 4/14/2005 11:47:56 PM
Database
Variables StdFactor1MultSqrtEV1, StdFactor2MultSqrtEV2, StdFactor3MultSqrtEV3
Distance Type Euclidean
Scale Type None

### Membership Summary Section for Clusters = 3

<table>
<tr><th>Row</th><th>Cluster</th><th>Cluster Membership</th><th>Sum of Squared Memberships</th><th>Bar of Squared Memberships</th><th>Silhouette Amount</th><th>Silhouette Bar</th></tr>
<tr><td>49 170</td><td>3</td><td>0.8190</td><td>0.6930</td><td>||||||||||||||||||||||</td><td>0.3888</td><td>|||||||||||||</td></tr>
<tr><td>46 166</td><td>3</td><td>0.7591</td><td>0.6056</td><td>|||||||||||||||||||</td><td>0.3885</td><td>|||||||||||||</td></tr>
<tr><td>24 70</td><td>3</td><td>0.7559</td><td>0.6098</td><td>|||||||||||||||||||</td><td>0.3270</td><td>|||||||||||</td></tr>
<tr><td>16 50</td><td>3</td><td>0.7433</td><td>0.5958</td><td>|||||||||||||||||||</td><td>0.3202</td><td>|||||||||||</td></tr>
<tr><td>23 69</td><td>3</td><td>0.6805</td><td>0.5142</td><td>||||||||||||||||</td><td>0.3860</td><td>|||||||||||||</td></tr>
<tr><td>19 57</td><td>3</td><td>0.6425</td><td>0.4775</td><td>|||||||||||||||</td><td>0.3516</td><td>||||||||||||</td></tr>
<tr><td>15 48</td><td>3</td><td>0.5862</td><td>0.4360</td><td>||||||||||||||</td><td>0.2270</td><td>||||||||</td></tr>
</table>

### Membership Matrix Section

| Row | Cluster | Prob in 1 | Prob in 2 | Prob in 3 |
|---|---|---|---|---|
| 1 5 | 1 | 0.7349 | 0.1133 | 0.1517 |
| 2 8 | 1 | 0.9365 | 0.0177 | 0.0457 |
| 3 9 | 1 | 0.8639 | 0.0423 | 0.0937 |
| 4 16 | 3 | 0.0366 | 0.0157 | 0.9477 |
| 5 17 | 1 | 0.8829 | 0.0302 | 0.0870 |
| 6 18 | 1 | 0.8347 | 0.0781 | 0.0872 |
| 7 23 | 3 | 0.0391 | 0.0180 | 0.9429 |
| 8 24 | 1 | 0.8845 | 0.0348 | 0.0807 |
| 9 25 | 1 | 0.7582 | 0.1260 | 0.1158 |
| 10 28 | 1 | 0.4238 | 0.3877 | 0.1885 |
| 11 30 | 2 | 0.0651 | 0.8755 | 0.0595 |
| 12 33 | 1 | 0.9165 | 0.0213 | 0.0622 |
| 13 44 | 1 | 0.6836 | 0.1466 | 0.1697 |
| 14 45 | 1 | 0.6944 | 0.1223 | 0.1833 |
| 15 48 | 3 | 0.2650 | 0.1488 | 0.5862 |
| 16 50 | 3 | 0.2003 | 0.0564 | 0.7433 |
| 17 51 | 1 | 0.7649 | 0.0740 | 0.1611 |
| 18 53 | 3 | 0.0786 | 0.0380 | 0.8834 |
| 19 57 | 3 | 0.1587 | 0.1988 | 0.6425 |
| 20 59 | 2 | 0.1502 | 0.7586 | 0.0913 |
| 21 62 | 1 | 0.9191 | 0.0220 | 0.0590 |
| 22 66 | 2 | 0.0824 | 0.8516 | 0.0660 |
| 23 69 | 3 | 0.1564 | 0.1631 | 0.6805 |
| 24 70 | 3 | 0.1876 | 0.0565 | 0.7559 |
| 25 76 | 3 | 0.1049 | 0.0319 | 0.8632 |
| 26 78 | 2 | 0.2985 | 0.4258 | 0.2757 |
| 27 79 | 1 | 0.9265 | 0.0184 | 0.0551 |
| 28 81 | 1 | 0.9238 | 0.0260 | 0.0501 |
| 29 88 | 2 | 0.1482 | 0.6248 | 0.2270 |
| 30 94 | 3 | 0.0673 | 0.0211 | 0.9116 |
| 31 96 | 1 | 0.9254 | 0.0189 | 0.0557 |
| 32 100 | 1 | 0.7689 | 0.0815 | 0.1497 |

## Fuzzy Clustering Report

| | |
|---|---|
| Page/Date/Time | 6 4/14/2005 11:47:56 PM |
| Database | |
| Variables | StdFactor1MultSqrtEV1, StdFactor2MultSqrtEV2, StdFactor3MultSqrtEV3 |
| Distance Type | Euclidean |
| Scale Type | None |

**Membership Matrix Section**

| Row | Cluster | Prob in 1 | Prob in 2 | Prob in 3 |
|---|---|---|---|---|
| 33 106 | 1 | 0.4705 | 0.1682 | 0.3613 |
| 34 108 | 3 | 0.0808 | 0.0302 | 0.8890 |
| 35 109 | 3 | 0.0974 | 0.0660 | 0.8366 |
| 36 111 | 1 | 0.4823 | 0.3724 | 0.1453 |
| 37 112 | 1 | 0.7818 | 0.0479 | 0.1703 |
| 38 116 | 1 | 0.9391 | 0.0152 | 0.0457 |
| 39 119 | 3 | 0.1065 | 0.0285 | 0.8650 |
| 40 123 | 1 | 0.8409 | 0.0571 | 0.1020 |
| 41 137 | 1 | 0.8847 | 0.0442 | 0.0712 |
| 42 145 | 1 | 0.8301 | 0.0459 | 0.1240 |
| 43 157 | 2 | 0.1249 | 0.7474 | 0.1277 |
| 44 160 | 3 | 0.0727 | 0.0185 | 0.9088 |
| 45 162 | 1 | 0.8652 | 0.0519 | 0.0829 |
| 46 166 | 3 | 0.1350 | 0.1059 | 0.7591 |
| 47 167 | 3 | 0.0465 | 0.0144 | 0.9390 |
| 48 169 | 1 | 0.8386 | 0.0451 | 0.1163 |
| 49 170 | 3 | 0.1448 | 0.0362 | 0.8190 |

**Cluster Medoids Section**

| Variable | Cluster1 | Cluster2 | Cluster3 | Cluster4 | |
|---|---|---|---|---|---|
| StdFactor1MultSqrtEV1 | | -0.9814608 | 1.645987 | 0.2446604 | -1.081726 |
| StdFactor2MultSqrtEV2 | | -0.7952168 | 0.5818861 | -0.3140762 | 1.268559 |
| StdFactor3MultSqrtEV3 | | 5.975914E-02 | 1.322993 | -0.5397611 | -0.1680644 |
| Row | 21 62 | 29 88 | 1 5 | 44 160 | |

## Fuzzy Clustering Report

Page/Date/Time 7 4/14/2005 11:47:56 PM
Database
Variables StdFactor1MultSqrtEV1, StdFactor2MultSqrtEV2, StdFactor3MultSqrtEV3
Distance Type Euclidean
Scale Type None

**Membership Summary Section for Clusters = 4**

<table>
<tr><th>Row</th><th>Cluster</th><th>Cluster Membership</th><th>Sum of Squared Memberships</th><th>Bar of Squared Memberships</th><th>Silhouette Amount</th><th>Silhouette Bar</th></tr>
<tr><td>21 62</td><td>1</td><td>0.9141</td><td>0.8391</td><td>|IIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.5773</td><td>|IIIIIIIIIIIIIIIII</td></tr>
<tr><td>8 24</td><td>1</td><td>0.8909</td><td>0.7988</td><td>|IIIIIIIIIIIIIIIIIIIIIIII</td><td>0.5958</td><td>|IIIIIIIIIIIIIIIIII</td></tr>
<tr><td>31 96</td><td>1</td><td>0.8704</td><td>0.7662</td><td>|IIIIIIIIIIIIIIIIIIIIIII</td><td>0.5154</td><td>|IIIIIIIIIIIIIII</td></tr>
<tr><td>3 9</td><td>1</td><td>0.8655</td><td>0.7565</td><td>|IIIIIIIIIIIIIIIIIIIIIII</td><td>0.5893</td><td>|IIIIIIIIIIIIIIIIII</td></tr>
<tr><td>38 116</td><td>1</td><td>0.8455</td><td>0.7284</td><td>|IIIIIIIIIIIIIIIIIIIIII</td><td>0.4639</td><td>|IIIIIIIIIIIIII</td></tr>
<tr><td>2 8</td><td>1</td><td>0.8249</td><td>0.6971</td><td>|IIIIIIIIIIIIIIIIIIIII</td><td>0.4242</td><td>|IIIIIIIIIIIII</td></tr>
<tr><td>17 51</td><td>1</td><td>0.7422</td><td>0.5758</td><td>|IIIIIIIIIIIIIIIII</td><td>0.5389</td><td>|IIIIIIIIIIIIIIII</td></tr>
<tr><td>32 100</td><td>1</td><td>0.7174</td><td>0.5458</td><td>|IIIIIIIIIIIIIIII</td><td>0.5104</td><td>|IIIIIIIIIIIIIII</td></tr>
<tr><td>5 17</td><td>1</td><td>0.6922</td><td>0.5261</td><td>|IIIIIIIIIIIIIIII</td><td>0.3370</td><td>|IIIIIIIIII</td></tr>
<tr><td>6 18</td><td>1</td><td>0.6381</td><td>0.4753</td><td>|IIIIIIIIIIIIII</td><td>0.3859</td><td>|IIIIIIIIIIII</td></tr>
<tr><td>13 44</td><td>1</td><td>0.5576</td><td>0.3873</td><td>|IIIIIIIIIIII</td><td>0.3953</td><td>|IIIIIIIIIIII</td></tr>
<tr><td>12 33</td><td>1</td><td>0.5303</td><td>0.4246</td><td>|IIIIIIIIIIIII</td><td>0.1126</td><td>|III</td></tr>
<tr><td>37 112</td><td>1</td><td>0.4725</td><td>0.3563</td><td>|IIIIIIIIIII</td><td>0.1541</td><td>|IIIII</td></tr>
<tr><td>41 137</td><td>1</td><td>0.4608</td><td>0.4043</td><td>|IIIIIIIIIIII</td><td>0.1557</td><td>|IIIII</td></tr>
<tr><td>29 88</td><td>2</td><td>0.7290</td><td>0.5570</td><td>|IIIIIIIIIIIIIIIII</td><td>0.0914</td><td>|III</td></tr>
<tr><td>19 57</td><td>2</td><td>0.7195</td><td>0.5494</td><td>|IIIIIIIIIIIIIIII</td><td>-0.3185</td><td>|</td></tr>
<tr><td>46 166</td><td>2</td><td>0.6053</td><td>0.4362</td><td>|IIIIIIIIIIIII</td><td>-0.4163</td><td>|</td></tr>
<tr><td>35 109</td><td>2</td><td>0.4994</td><td>0.3837</td><td>|IIIIIIIIIIII</td><td>-0.5207</td><td>|</td></tr>
<tr><td>11 30</td><td>2</td><td>0.4686</td><td>0.3208</td><td>|IIIIIIIIII</td><td>0.2367</td><td>|IIIIIII</td></tr>
<tr><td>20 59</td><td>2</td><td>0.4429</td><td>0.3247</td><td>|IIIIIIIIII</td><td>-0.2140</td><td>|</td></tr>
<tr><td>43 157</td><td>2</td><td>0.4379</td><td>0.2990</td><td>|IIIIIIIII</td><td>0.2407</td><td>|IIIIIII</td></tr>
<tr><td>22 66</td><td>2</td><td>0.4371</td><td>0.3040</td><td>|IIIIIIIII</td><td>0.1799</td><td>|IIIII</td></tr>
<tr><td>23 69</td><td>2</td><td>0.4295</td><td>0.3304</td><td>|IIIIIIIIII</td><td>-0.4190</td><td>|</td></tr>
<tr><td>1 5</td><td>3</td><td>0.8298</td><td>0.6999</td><td>|IIIIIIIIIIIIIIIIIIIII</td><td>0.3417</td><td>|IIIIIIIIII</td></tr>
<tr><td>9 25</td><td>3</td><td>0.8282</td><td>0.6986</td><td>|IIIIIIIIIIIIIIIIIIIII</td><td>0.3346</td><td>|IIIIIIIIII</td></tr>
<tr><td>48 169</td><td>3</td><td>0.8276</td><td>0.6985</td><td>|IIIIIIIIIIIIIIIIIIIII</td><td>0.2820</td><td>|IIIIIIII</td></tr>
<tr><td>14 45</td><td>3</td><td>0.7478</td><td>0.5829</td><td>|IIIIIIIIIIIIIIIII</td><td>0.3733</td><td>|IIIIIIIIIII</td></tr>
<tr><td>42 145</td><td>3</td><td>0.6819</td><td>0.5142</td><td>|IIIIIIIIIIIIIII</td><td>0.1723</td><td>|IIIII</td></tr>
<tr><td>10 28</td><td>3</td><td>0.6199</td><td>0.4425</td><td>|IIIIIIIIIIIII</td><td>0.3193</td><td>|IIIIIIIIII</td></tr>
<tr><td>40 123</td><td>3</td><td>0.5736</td><td>0.4257</td><td>|IIIIIIIIIIIII</td><td>-0.0825</td><td>|</td></tr>
<tr><td>28 81</td><td>3</td><td>0.5343</td><td>0.4402</td><td>|IIIIIIIIIIIII</td><td>-0.0939</td><td>|</td></tr>
<tr><td>45 162</td><td>3</td><td>0.5329</td><td>0.4135</td><td>|IIIIIIIIIIII</td><td>-0.1437</td><td>|</td></tr>
<tr><td>27 79</td><td>3</td><td>0.4968</td><td>0.4249</td><td>|IIIIIIIIIIIII</td><td>-0.1368</td><td>|</td></tr>
<tr><td>36 111</td><td>3</td><td>0.4521</td><td>0.3220</td><td>|IIIIIIIIII</td><td>0.0131</td><td>|</td></tr>
<tr><td>33 106</td><td>3</td><td>0.3762</td><td>0.2737</td><td>|IIIIIIII</td><td>0.1694</td><td>|IIIII</td></tr>
<tr><td>26 78</td><td>3</td><td>0.3703</td><td>0.2883</td><td>|IIIIIIIII</td><td>0.2985</td><td>|IIIIIIIII</td></tr>
<tr><td>44 160</td><td>4</td><td>0.8956</td><td>0.8057</td><td>|IIIIIIIIIIIIIIIIIIIIIIII</td><td>0.5647</td><td>|IIIIIIIIIIIIIIIII</td></tr>
<tr><td>7 23</td><td>4</td><td>0.8906</td><td>0.7978</td><td>|IIIIIIIIIIIIIIIIIIIIIIII</td><td>0.5903</td><td>|IIIIIIIIIIIIIIIIII</td></tr>
<tr><td>30 94</td><td>4</td><td>0.8896</td><td>0.7954</td><td>|IIIIIIIIIIIIIIIIIIIIIIII</td><td>0.5740</td><td>|IIIIIIIIIIIIIIIII</td></tr>
<tr><td>4 16</td><td>4</td><td>0.8709</td><td>0.7649</td><td>|IIIIIIIIIIIIIIIIIIIIIII</td><td>0.5587</td><td>|IIIIIIIIIIIIIIIII</td></tr>
<tr><td>47 167</td><td>4</td><td>0.8590</td><td>0.7448</td><td>|IIIIIIIIIIIIIIIIIIIIII</td><td>0.5441</td><td>|IIIIIIIIIIIIIIII</td></tr>
<tr><td>39 119</td><td>4</td><td>0.8332</td><td>0.7036</td><td>|IIIIIIIIIIIIIIIIIIIII</td><td>0.5247</td><td>|IIIIIIIIIIIIIIII</td></tr>
</table>

## Fuzzy Clustering Report

| | |
|---|---|
| Page/Date/Time | 8 4/14/2005 11:47:56 PM |
| Database | |
| Variables | StdFactor1MultSqrtEV1, StdFactor2MultSqrtEV2, StdFactor3MultSqrtEV3 |
| Distance Type | Euclidean |
| Scale Type | None |

**Membership Summary Section for Clusters = 4**

| Row | Cluster | Cluster Membership | Sum of Squared Memberships | Bar of Squared Memberships | Silhouette Amount | Silhouette Bar |
|---|---|---|---|---|---|---|
| 34 108 | 4 | 0.8054 | 0.6618 | \|IIIIIIIIIIIIIIIIIIII | 0.4925 | \|IIIIIIIIIIIIIII |
| 25 76 | 4 | 0.7524 | 0.5869 | \|IIIIIIIIIIIIIIIIII | 0.4696 | \|IIIIIIIIIIIIII |
| 49 170 | 4 | 0.7065 | 0.5286 | \|IIIIIIIIIIIIIIII | 0.4162 | \|IIIIIIIIIIII |
| 16 50 | 4 | 0.6082 | 0.4232 | \|IIIIIIIIIIIII | 0.3321 | \|IIIIIIIIII |
| 24 70 | 4 | 0.5821 | 0.3985 | \|IIIIIIIIIIII | 0.3167 | \|IIIIIIIIII |
| 18 53 | 4 | 0.5341 | 0.3924 | \|IIIIIIIIIIII | 0.4210 | \|IIIIIIIIIIIII |
| 15 48 | 4 | 0.4220 | 0.2915 | \|IIIIIIIII | 0.1854 | \|IIIIII |

**Membership Matrix Section**

| Row | Cluster | Prob in 1 | Prob in 2 | Prob in 3 | Prob in 4 |
|---|---|---|---|---|---|
| 1 5 | 3 | 0.0876 | 0.0496 | 0.8298 | 0.0330 |
| 2 8 | 1 | 0.8249 | 0.0210 | 0.1239 | 0.0302 |
| 3 9 | 1 | 0.8655 | 0.0253 | 0.0756 | 0.0337 |
| 4 16 | 4 | 0.0267 | 0.0683 | 0.0342 | 0.8709 |
| 5 17 | 1 | 0.6922 | 0.0398 | 0.2026 | 0.0654 |
| 6 18 | 1 | 0.6381 | 0.0658 | 0.2477 | 0.0483 |
| 7 23 | 4 | 0.0238 | 0.0560 | 0.0295 | 0.8906 |
| 8 24 | 1 | 0.8909 | 0.0196 | 0.0632 | 0.0263 |
| 9 25 | 3 | 0.0995 | 0.0449 | 0.8282 | 0.0273 |
| 10 28 | 3 | 0.1125 | 0.2036 | 0.6199 | 0.0640 |
| 11 30 | 2 | 0.1508 | 0.4686 | 0.2454 | 0.1352 |
| 12 33 | 1 | 0.5303 | 0.0401 | 0.3722 | 0.0574 |
| 13 44 | 1 | 0.5576 | 0.1210 | 0.2318 | 0.0896 |
| 14 45 | 3 | 0.1239 | 0.0709 | 0.7478 | 0.0574 |
| 15 48 | 4 | 0.1561 | 0.2090 | 0.2129 | 0.4220 |
| 16 50 | 4 | 0.1667 | 0.1209 | 0.1041 | 0.6082 |
| 17 51 | 1 | 0.7422 | 0.0572 | 0.1279 | 0.0727 |
| 18 53 | 4 | 0.0691 | 0.3070 | 0.0898 | 0.5341 |
| 19 57 | 2 | 0.0508 | 0.7195 | 0.0774 | 0.1523 |
| 20 59 | 2 | 0.1555 | 0.4429 | 0.3097 | 0.0919 |
| 21 62 | 1 | 0.9141 | 0.0134 | 0.0545 | 0.0180 |
| 22 66 | 2 | 0.1743 | 0.4371 | 0.2536 | 0.1350 |
| 23 69 | 2 | 0.0819 | 0.4295 | 0.1446 | 0.3440 |
| 24 70 | 4 | 0.1632 | 0.1446 | 0.1101 | 0.5821 |
| 25 76 | 4 | 0.0875 | 0.0927 | 0.0674 | 0.7524 |
| 26 78 | 3 | 0.1475 | 0.3222 | 0.3703 | 0.1600 |
| 27 79 | 3 | 0.4176 | 0.0372 | 0.4968 | 0.0485 |
| 28 81 | 3 | 0.3897 | 0.0375 | 0.5343 | 0.0386 |
| 29 88 | 2 | 0.0671 | 0.7290 | 0.1124 | 0.0915 |
| 30 94 | 4 | 0.0324 | 0.0403 | 0.0377 | 0.8896 |
| 31 96 | 1 | 0.8704 | 0.0166 | 0.0876 | 0.0253 |
| 32 100 | 1 | 0.7174 | 0.0661 | 0.1491 | 0.0675 |

## Fuzzy Clustering Report

| | |
|---|---|
| Page/Date/Time | 9 4/14/2005 11:47:56 PM |
| Database | |
| Variables | StdFactor1MultSqrtEV1, StdFactor2MultSqrtEV2, StdFactor3MultSqrtEV3 |
| Distance Type | Euclidean |
| Scale Type | None |

**Membership Matrix Section**

| **Row** | **Cluster** | **Prob in 1** | **Prob in 2** | **Prob in 3** | **Prob in 4** |
|---|---|---|---|---|---|
| 33 106 | 3 | 0.2315 | 0.1673 | 0.3762 | 0.2250 |
| 34 108 | 4 | 0.0473 | 0.0804 | 0.0669 | 0.8054 |
| 35 109 | 2 | 0.0606 | 0.4994 | 0.0899 | 0.3501 |
| 36 111 | 3 | 0.2391 | 0.2341 | 0.4521 | 0.0747 |
| 37 112 | 1 | 0.4725 | 0.0672 | 0.3364 | 0.1240 |
| 38 116 | 1 | 0.8455 | 0.0187 | 0.1121 | 0.0237 |
| 39 119 | 4 | 0.0556 | 0.0514 | 0.0597 | 0.8332 |
| 40 123 | 3 | 0.2964 | 0.0788 | 0.5736 | 0.0512 |
| 41 137 | 1 | 0.4608 | 0.0637 | 0.4312 | 0.0442 |
| 42 145 | 3 | 0.2073 | 0.0496 | 0.6819 | 0.0612 |
| 43 157 | 2 | 0.1689 | 0.4379 | 0.2234 | 0.1698 |
| 44 160 | 4 | 0.0356 | 0.0333 | 0.0355 | 0.8956 |
| 45 162 | 3 | 0.3497 | 0.0714 | 0.5329 | 0.0459 |
| 46 166 | 2 | 0.0580 | 0.6053 | 0.0984 | 0.2383 |
| 47 167 | 4 | 0.0389 | 0.0616 | 0.0405 | 0.8590 |
| 48 169 | 3 | 0.1064 | 0.0327 | 0.8276 | 0.0333 |
| 49 170 | 4 | 0.1209 | 0.0899 | 0.0827 | 0.7065 |

**Cluster Medoids Section**

| **Variable** | **Cluster1** | **Cluster2** | **Cluster3** | **Cluster4** | **Cluster5** | |
|---|---|---|---|---|---|---|
| StdFactor1MultSqrtEV1 | | -0.9814608 | 4.386005 | -0.8342786 | -6.462853E-02 | -1.060053 |
| StdFactor2MultSqrtEV2 | | -0.7952168 | -0.9627987 | 1.411811 | -0.3396268 | 0.9364008 |
| StdFactor3MultSqrtEV3 | | 5.975914E-02 | 1.013824 | -0.393572 | -0.7719269 | 0.769066 |
| Row | 21 62 | 11 30 | 30 94 | 48 169 | 25 76 | |

## Fuzzy Clustering Report

Page/Date/Time 10 4/14/2005 11:47:56 PM
Database
Variables StdFactor1MultSqrtEV1, StdFactor2MultSqrtEV2, StdFactor3MultSqrtEV3
Distance Type Euclidean
Scale Type None

### Membership Summary Section for Clusters = 5

<table>
<tr><th>Row</th><th>Cluster</th><th>Cluster Membership</th><th>Sum of Squared Memberships</th><th>Bar of Squared Memberships</th><th>Silhouette Amount</th><th>Silhouette Bar</th></tr>
<tr><td>21 62</td><td>1</td><td>0.9085</td><td>0.8292</td><td>||||||||||||||||||||||||||</td><td>0.6052</td><td>|||||||||||||||||||</td></tr>
<tr><td>8 24</td><td>1</td><td>0.9001</td><td>0.8141</td><td>|||||||||||||||||||||||||</td><td>0.6250</td><td>||||||||||||||||||||</td></tr>
<tr><td>3 9</td><td>1</td><td>0.8777</td><td>0.7762</td><td>||||||||||||||||||||||||</td><td>0.6168</td><td>||||||||||||||||||||</td></tr>
<tr><td>38 116</td><td>1</td><td>0.8189</td><td>0.6884</td><td>||||||||||||||||||||||</td><td>0.5053</td><td>||||||||||||||||</td></tr>
<tr><td>32 100</td><td>1</td><td>0.7969</td><td>0.6495</td><td>||||||||||||||||||||</td><td>0.5973</td><td>|||||||||||||||||||</td></tr>
<tr><td>6 18</td><td>1</td><td>0.7794</td><td>0.6296</td><td>||||||||||||||||||||</td><td>0.5216</td><td>|||||||||||||||||</td></tr>
<tr><td>17 51</td><td>1</td><td>0.7776</td><td>0.6217</td><td>||||||||||||||||||||</td><td>0.5860</td><td>|||||||||||||||||||</td></tr>
<tr><td>31 96</td><td>1</td><td>0.7562</td><td>0.6033</td><td>|||||||||||||||||||</td><td>0.4544</td><td>|||||||||||||||</td></tr>
<tr><td>13 44</td><td>1</td><td>0.6784</td><td>0.4957</td><td>||||||||||||||||</td><td>0.5066</td><td>||||||||||||||||</td></tr>
<tr><td>41 137</td><td>1</td><td>0.5988</td><td>0.4537</td><td>|||||||||||||||</td><td>0.3522</td><td>||||||||||||</td></tr>
<tr><td>2 8</td><td>1</td><td>0.5959</td><td>0.4587</td><td>|||||||||||||||</td><td>0.3155</td><td>||||||||||</td></tr>
<tr><td>45 162</td><td>1</td><td>0.4814</td><td>0.3978</td><td>|||||||||||||</td><td>0.2420</td><td>||||||||</td></tr>
<tr><td>11 30</td><td>2</td><td>0.9609</td><td>0.9237</td><td>|||||||||||||||||||||||||||||</td><td>0.5645</td><td>||||||||||||||||||</td></tr>
<tr><td>22 66</td><td>2</td><td>0.9254</td><td>0.8578</td><td>|||||||||||||||||||||||||||</td><td>0.5196</td><td>|||||||||||||||||</td></tr>
<tr><td>43 157</td><td>2</td><td>0.8656</td><td>0.7538</td><td>||||||||||||||||||||||||</td><td>0.5819</td><td>||||||||||||||||||</td></tr>
<tr><td>30 94</td><td>3</td><td>0.8866</td><td>0.7923</td><td>|||||||||||||||||||||||||</td><td>0.5054</td><td>||||||||||||||||</td></tr>
<tr><td>34 108</td><td>3</td><td>0.8842</td><td>0.7875</td><td>|||||||||||||||||||||||||</td><td>0.5063</td><td>||||||||||||||||</td></tr>
<tr><td>7 23</td><td>3</td><td>0.8693</td><td>0.7659</td><td>||||||||||||||||||||||||</td><td>0.3657</td><td>||||||||||||</td></tr>
<tr><td>4 16</td><td>3</td><td>0.7987</td><td>0.6634</td><td>|||||||||||||||||||||</td><td>0.2097</td><td>|||||||</td></tr>
<tr><td>39 119</td><td>3</td><td>0.7860</td><td>0.6378</td><td>||||||||||||||||||||</td><td>0.4652</td><td>|||||||||||||||</td></tr>
<tr><td>44 160</td><td>3</td><td>0.7397</td><td>0.5844</td><td>|||||||||||||||||||</td><td>0.3517</td><td>||||||||||||</td></tr>
<tr><td>23 69</td><td>3</td><td>0.5459</td><td>0.3736</td><td>||||||||||||</td><td>0.1496</td><td>|||||</td></tr>
<tr><td>15 48</td><td>3</td><td>0.4857</td><td>0.3193</td><td>|||||||||||</td><td>0.3628</td><td>||||||||||||</td></tr>
<tr><td>48 169</td><td>4</td><td>0.9064</td><td>0.8250</td><td>||||||||||||||||||||||||||</td><td>0.2670</td><td>|||||||||</td></tr>
<tr><td>1 5</td><td>4</td><td>0.8446</td><td>0.7221</td><td>|||||||||||||||||||||||</td><td>0.2556</td><td>|||||||||</td></tr>
<tr><td>42 145</td><td>4</td><td>0.8428</td><td>0.7199</td><td>|||||||||||||||||||||||</td><td>0.2486</td><td>||||||||</td></tr>
<tr><td>9 25</td><td>4</td><td>0.8346</td><td>0.7079</td><td>||||||||||||||||||||||</td><td>0.2441</td><td>||||||||</td></tr>
<tr><td>14 45</td><td>4</td><td>0.8211</td><td>0.6850</td><td>||||||||||||||||||||||</td><td>0.3492</td><td>|||||||||||</td></tr>
<tr><td>27 79</td><td>4</td><td>0.7689</td><td>0.6208</td><td>||||||||||||||||||||</td><td>-0.0447</td><td>|</td></tr>
<tr><td>28 81</td><td>4</td><td>0.7528</td><td>0.6038</td><td>|||||||||||||||||||</td><td>-0.0311</td><td>|</td></tr>
<tr><td>12 33</td><td>4</td><td>0.7009</td><td>0.5405</td><td>|||||||||||||||||</td><td>-0.0615</td><td>|</td></tr>
<tr><td>10 28</td><td>4</td><td>0.5686</td><td>0.3813</td><td>||||||||||||</td><td>0.2147</td><td>|||||||</td></tr>
<tr><td>37 112</td><td>4</td><td>0.4962</td><td>0.3507</td><td>||||||||||||</td><td>-0.0331</td><td>|</td></tr>
<tr><td>40 123</td><td>4</td><td>0.4508</td><td>0.3794</td><td>||||||||||||</td><td>-0.2760</td><td>|</td></tr>
<tr><td>5 17</td><td>4</td><td>0.4296</td><td>0.3762</td><td>||||||||||||</td><td>-0.2404</td><td>|</td></tr>
<tr><td>33 106</td><td>4</td><td>0.3959</td><td>0.2726</td><td>|||||||||</td><td>0.0826</td><td>|||</td></tr>
<tr><td>26 78</td><td>4</td><td>0.3718</td><td>0.2482</td><td>||||||||</td><td>0.1625</td><td>||||||</td></tr>
<tr><td>36 111</td><td>4</td><td>0.3717</td><td>0.2999</td><td>||||||||||</td><td>-0.1371</td><td>|</td></tr>
<tr><td>20 59</td><td>4</td><td>0.2942</td><td>0.2194</td><td>||||||||</td><td>-0.0048</td><td>|</td></tr>
<tr><td>25 76</td><td>5</td><td>0.8768</td><td>0.7756</td><td>||||||||||||||||||||||||</td><td>0.3037</td><td>||||||||||</td></tr>
<tr><td>49 170</td><td>5</td><td>0.8422</td><td>0.7192</td><td>|||||||||||||||||||||||</td><td>0.2922</td><td>||||||||||</td></tr>
<tr><td>24 70</td><td>5</td><td>0.8298</td><td>0.6988</td><td>||||||||||||||||||||||</td><td>0.3582</td><td>||||||||||||</td></tr>
</table>

## Fuzzy Clustering Report

| | |
|---|---|
| Page/Date/Time | 11 4/14/2005 11:47:56 PM |
| Database | |
| Variables | StdFactor1MultSqrtEV1, StdFactor2MultSqrtEV2, StdFactor3MultSqrtEV3 |
| Distance Type | Euclidean |
| Scale Type | None |

**Membership Summary Section for Clusters = 5**

<table>
<tr><th>Row</th><th>Cluster</th><th>Cluster Membership</th><th>Sum of Squared Memberships</th><th>Bar of Squared Memberships</th><th>Silhouette Amount</th><th>Silhouette Bar</th></tr>
<tr><td>16 50</td><td>5</td><td>0.7501</td><td>0.5852</td><td>|||||||||||||||||||</td><td>0.2483</td><td>||||||||</td></tr>
<tr><td>47 167</td><td>5</td><td>0.6722</td><td>0.5248</td><td>|||||||||||||||||</td><td>0.1087</td><td>||||</td></tr>
<tr><td>18 53</td><td>5</td><td>0.6172</td><td>0.4637</td><td>|||||||||||||||</td><td>0.2762</td><td>|||||||||</td></tr>
<tr><td>35 109</td><td>5</td><td>0.5166</td><td>0.3940</td><td>|||||||||||||</td><td>0.2741</td><td>|||||||||</td></tr>
<tr><td>19 57</td><td>5</td><td>0.4821</td><td>0.3373</td><td>|||||||||||</td><td>0.3428</td><td>|||||||||||</td></tr>
<tr><td>46 166</td><td>5</td><td>0.4409</td><td>0.3422</td><td>|||||||||||</td><td>0.2314</td><td>||||||||</td></tr>
<tr><td>29 88</td><td>5</td><td>0.3012</td><td>0.2184</td><td>||||||||</td><td>0.2126</td><td>|||||||</td></tr>
</table>

**Membership Matrix Section**

| Row | Cluster | Prob in 1 | Prob in 2 | Prob in 3 | Prob in 4 | Prob in 5 |
|---|---|---|---|---|---|---|
| 1 5 | 4 | 0.0786 | 0.0042 | 0.0379 | 0.8446 | 0.0348 |
| 2 8 | 1 | 0.5959 | 0.0037 | 0.0383 | 0.3162 | 0.0459 |
| 3 9 | 1 | 0.8777 | 0.0029 | 0.0205 | 0.0651 | 0.0338 |
| 4 16 | 3 | 0.0179 | 0.0021 | 0.7987 | 0.0247 | 0.1567 |
| 5 17 | 4 | 0.4268 | 0.0059 | 0.0675 | 0.4296 | 0.0701 |
| 6 18 | 1 | 0.7794 | 0.0061 | 0.0288 | 0.1378 | 0.0479 |
| 7 23 | 3 | 0.0131 | 0.0018 | 0.8693 | 0.0178 | 0.0980 |
| 8 24 | 1 | 0.9001 | 0.0021 | 0.0161 | 0.0552 | 0.0265 |
| 9 25 | 4 | 0.0962 | 0.0055 | 0.0323 | 0.8346 | 0.0314 |
| 10 28 | 4 | 0.1770 | 0.0266 | 0.1122 | 0.5686 | 0.1156 |
| 11 30 | 2 | 0.0095 | 0.9609 | 0.0088 | 0.0115 | 0.0093 |
| 12 33 | 4 | 0.2144 | 0.0033 | 0.0411 | 0.7009 | 0.0403 |
| 13 44 | 1 | 0.6784 | 0.0148 | 0.0561 | 0.1436 | 0.1071 |
| 14 45 | 4 | 0.0792 | 0.0065 | 0.0533 | 0.8211 | 0.0399 |
| 15 48 | 3 | 0.1117 | 0.0281 | 0.4857 | 0.1835 | 0.1909 |
| 16 50 | 5 | 0.0759 | 0.0055 | 0.1203 | 0.0482 | 0.7501 |
| 17 51 | 1 | 0.7776 | 0.0072 | 0.0420 | 0.0962 | 0.0769 |
| 18 53 | 5 | 0.0454 | 0.0052 | 0.2790 | 0.0532 | 0.6172 |
| 19 57 | 5 | 0.0932 | 0.0244 | 0.2881 | 0.1122 | 0.4821 |
| 20 59 | 4 | 0.2500 | 0.1439 | 0.1335 | 0.2942 | 0.1784 |
| 21 62 | 1 | 0.9085 | 0.0015 | 0.0129 | 0.0563 | 0.0207 |
| 22 66 | 2 | 0.0200 | 0.9254 | 0.0153 | 0.0222 | 0.0172 |
| 23 69 | 3 | 0.0727 | 0.0250 | 0.5459 | 0.1226 | 0.2339 |
| 24 70 | 5 | 0.0537 | 0.0039 | 0.0789 | 0.0337 | 0.8298 |
| 25 76 | 5 | 0.0257 | 0.0021 | 0.0758 | 0.0196 | 0.8768 |
| 26 78 | 4 | 0.1542 | 0.0828 | 0.2330 | 0.3718 | 0.1581 |
| 27 79 | 4 | 0.1666 | 0.0025 | 0.0306 | 0.7689 | 0.0314 |
| 28 81 | 4 | 0.1886 | 0.0035 | 0.0271 | 0.7528 | 0.0281 |
| 29 88 | 5 | 0.1606 | 0.1214 | 0.2203 | 0.1964 | 0.3012 |
| 30 94 | 3 | 0.0158 | 0.0018 | 0.8866 | 0.0220 | 0.0738 |
| 31 96 | 1 | 0.7562 | 0.0032 | 0.0304 | 0.1702 | 0.0400 |
| 32 100 | 1 | 0.7969 | 0.0070 | 0.0357 | 0.0913 | 0.0691 |

## Fuzzy Clustering Report

| | |
|---|---|
| Page/Date/Time | 12 4/14/2005 11:47:56 PM |
| Database | |
| Variables | StdFactor1MultSqrtEV1, StdFactor2MultSqrtEV2, StdFactor3MultSqrtEV3 |
| Distance Type | Euclidean |
| Scale Type | None |

**Membership Matrix Section**

| Row | Cluster | Prob in 1 | Prob in 2 | Prob in 3 | Prob in 4 | Prob in 5 |
|---|---|---|---|---|---|---|
| 33 106 | 4 | 0.1760 | 0.0317 | 0.2501 | 0.3959 | 0.1463 |
| 34 108 | 3 | 0.0170 | 0.0024 | 0.8842 | 0.0277 | 0.0688 |
| 35 109 | 5 | 0.0563 | 0.0098 | 0.3443 | 0.0730 | 0.5166 |
| 36 111 | 4 | 0.3676 | 0.0408 | 0.0903 | 0.3717 | 0.1297 |
| 37 112 | 4 | 0.2879 | 0.0093 | 0.1121 | 0.4962 | 0.0944 |
| 38 116 | 1 | 0.8189 | 0.0021 | 0.0199 | 0.1285 | 0.0306 |
| 39 119 | 3 | 0.0351 | 0.0037 | 0.7860 | 0.0462 | 0.1291 |
| 40 123 | 4 | 0.4085 | 0.0073 | 0.0534 | 0.4508 | 0.0800 |
| 41 137 | 1 | 0.5988 | 0.0060 | 0.0370 | 0.3007 | 0.0574 |
| 42 145 | 4 | 0.0852 | 0.0035 | 0.0382 | 0.8428 | 0.0303 |
| 43 157 | 2 | 0.0317 | 0.8656 | 0.0326 | 0.0359 | 0.0342 |
| 44 160 | 3 | 0.0326 | 0.0031 | 0.7397 | 0.0381 | 0.1865 |
| 45 162 | 1 | 0.4814 | 0.0072 | 0.0448 | 0.3993 | 0.0672 |
| 46 166 | 5 | 0.0746 | 0.0154 | 0.3610 | 0.1081 | 0.4409 |
| 47 167 | 5 | 0.0285 | 0.0028 | 0.2669 | 0.0297 | 0.6722 |
| 48 169 | 4 | 0.0507 | 0.0020 | 0.0220 | 0.9064 | 0.0189 |
| 49 170 | 5 | 0.0404 | 0.0030 | 0.0865 | 0.0279 | 0.8422 |

**Cluster Medoids Section**

| Variable | Cluster1 | Cluster2 | Cluster3 | Cluster4 | Cluster5 | Cluster6 | |
|---|---|---|---|---|---|---|---|
| StdFactor1MultSqrtEV1 | | -1.162144 | 0.9165859 | 4.386005 | -0.6451804 | -0.525069 | - |
| 1.266775 | | | | | | | |
| StdFactor2MultSqrtEV2 | | -0.9014585 | -0.3741953 | -0.9627987 | -0.4502835 | 1.498326 | |
| | 0.8357013 | | | | | | |
| StdFactor3MultSqrtEV3 | | 0.1471108 | -0.2190135 | 1.013824 | -0.6754565 | -5.762641E-02 | |
| | 0.7857837 | | | | | | |
| Row | 8 24 | 10 28 | 11 30 | 12 33 | 7 23 | 49 170 | |

## Fuzzy Clustering Report

Page/Date/Time 13 4/14/2005 11:47:56 PM
Database
Variables StdFactor1MultSqrtEV1, StdFactor2MultSqrtEV2, StdFactor3MultSqrtEV3
Distance Type Euclidean
Scale Type None

**Membership Summary Section for Clusters = 6**

<table>
<tr><th>Row</th><th>Cluster</th><th>Cluster Membership</th><th>Sum of Squared Memberships</th><th>Bar of Squared Memberships</th><th>Silhouette Amount</th><th>Silhouette Bar</th></tr>
<tr><td>8 24</td><td>1</td><td>0.9151</td><td>0.8398</td><td>||||||||||||||||||||||||||</td><td>0.5866</td><td>|||||||||||||||||||</td></tr>
<tr><td>3 9</td><td>1</td><td>0.9002</td><td>0.8136</td><td>|||||||||||||||||||||||||</td><td>0.5873</td><td>|||||||||||||||||||</td></tr>
<tr><td>21 62</td><td>1</td><td>0.8703</td><td>0.7638</td><td>||||||||||||||||||||||||</td><td>0.5153</td><td>||||||||||||||||</td></tr>
<tr><td>32 100</td><td>1</td><td>0.8189</td><td>0.6795</td><td>|||||||||||||||||||||</td><td>0.6201</td><td>||||||||||||||||||||</td></tr>
<tr><td>17 51</td><td>1</td><td>0.8151</td><td>0.6737</td><td>|||||||||||||||||||||</td><td>0.5931</td><td>|||||||||||||||||||</td></tr>
<tr><td>6 18</td><td>1</td><td>0.6467</td><td>0.4628</td><td>|||||||||||||||</td><td>0.4742</td><td>|||||||||||||||</td></tr>
<tr><td>13 44</td><td>1</td><td>0.6299</td><td>0.4349</td><td>||||||||||||||</td><td>0.4977</td><td>||||||||||||||||</td></tr>
<tr><td>38 116</td><td>1</td><td>0.6144</td><td>0.4400</td><td>||||||||||||||</td><td>0.3120</td><td>||||||||||</td></tr>
<tr><td>31 96</td><td>1</td><td>0.4879</td><td>0.3865</td><td>|||||||||||||</td><td>0.1246</td><td>|||||</td></tr>
<tr><td>10 28</td><td>2</td><td>0.7477</td><td>0.5760</td><td>||||||||||||||||||</td><td>0.3100</td><td>||||||||||</td></tr>
<tr><td>1 5</td><td>2</td><td>0.7223</td><td>0.5575</td><td>||||||||||||||||||</td><td>-0.1050</td><td>|</td></tr>
<tr><td>9 25</td><td>2</td><td>0.7120</td><td>0.5464</td><td>|||||||||||||||||</td><td>-0.0808</td><td>|</td></tr>
<tr><td>40 123</td><td>2</td><td>0.6482</td><td>0.4624</td><td>|||||||||||||||</td><td>-0.0664</td><td>|</td></tr>
<tr><td>45 162</td><td>2</td><td>0.6257</td><td>0.4425</td><td>||||||||||||||</td><td>-0.1289</td><td>|</td></tr>
<tr><td>36 111</td><td>2</td><td>0.5741</td><td>0.3802</td><td>||||||||||||</td><td>0.1516</td><td>||||||</td></tr>
<tr><td>41 137</td><td>2</td><td>0.4767</td><td>0.3401</td><td>|||||||||||</td><td>-0.2855</td><td>|</td></tr>
<tr><td>14 45</td><td>2</td><td>0.4442</td><td>0.3584</td><td>||||||||||||</td><td>-0.3135</td><td>|</td></tr>
<tr><td>20 59</td><td>2</td><td>0.4345</td><td>0.2555</td><td>|||||||||</td><td>0.2696</td><td>|||||||||</td></tr>
<tr><td>26 78</td><td>2</td><td>0.3371</td><td>0.2165</td><td>|||||||</td><td>0.0445</td><td>||</td></tr>
<tr><td>29 88</td><td>2</td><td>0.2835</td><td>0.1915</td><td>|||||||</td><td>0.0579</td><td>|||</td></tr>
<tr><td>11 30</td><td>3</td><td>0.9509</td><td>0.9048</td><td>||||||||||||||||||||||||||||</td><td>0.4926</td><td>||||||||||||||||</td></tr>
<tr><td>22 66</td><td>3</td><td>0.9052</td><td>0.8213</td><td>||||||||||||||||||||||||||</td><td>0.4466</td><td>||||||||||||||</td></tr>
<tr><td>43 157</td><td>3</td><td>0.8400</td><td>0.7109</td><td>||||||||||||||||||||||</td><td>0.5371</td><td>|||||||||||||||||</td></tr>
<tr><td>12 33</td><td>4</td><td>0.9066</td><td>0.8248</td><td>||||||||||||||||||||||||||</td><td>0.4560</td><td>|||||||||||||||</td></tr>
<tr><td>27 79</td><td>4</td><td>0.8612</td><td>0.7488</td><td>|||||||||||||||||||||||</td><td>0.3997</td><td>|||||||||||||</td></tr>
<tr><td>42 145</td><td>4</td><td>0.7806</td><td>0.6281</td><td>||||||||||||||||||||</td><td>0.5259</td><td>|||||||||||||||||</td></tr>
<tr><td>28 81</td><td>4</td><td>0.7741</td><td>0.6197</td><td>||||||||||||||||||||</td><td>0.3627</td><td>||||||||||||</td></tr>
<tr><td>5 17</td><td>4</td><td>0.7441</td><td>0.5766</td><td>||||||||||||||||||</td><td>0.3021</td><td>||||||||||</td></tr>
<tr><td>37 112</td><td>4</td><td>0.6846</td><td>0.4963</td><td>||||||||||||||||</td><td>0.4264</td><td>||||||||||||||</td></tr>
<tr><td>2 8</td><td>4</td><td>0.6647</td><td>0.4941</td><td>||||||||||||||||</td><td>0.0488</td><td>||</td></tr>
<tr><td>48 169</td><td>4</td><td>0.5826</td><td>0.4379</td><td>||||||||||||||</td><td>0.3358</td><td>|||||||||||</td></tr>
<tr><td>33 106</td><td>4</td><td>0.3395</td><td>0.2248</td><td>||||||||</td><td>0.2939</td><td>||||||||||</td></tr>
<tr><td>7 23</td><td>5</td><td>0.8810</td><td>0.7824</td><td>||||||||||||||||||||||||</td><td>0.2035</td><td>|||||||</td></tr>
<tr><td>4 16</td><td>5</td><td>0.8534</td><td>0.7379</td><td>|||||||||||||||||||||||</td><td>0.1392</td><td>|||||</td></tr>
<tr><td>34 108</td><td>5</td><td>0.8518</td><td>0.7321</td><td>|||||||||||||||||||||||</td><td>0.3360</td><td>|||||||||||</td></tr>
<tr><td>30 94</td><td>5</td><td>0.8231</td><td>0.6888</td><td>||||||||||||||||||||||</td><td>0.2003</td><td>|||||||</td></tr>
<tr><td>39 119</td><td>5</td><td>0.6832</td><td>0.5006</td><td>||||||||||||||||</td><td>0.0992</td><td>||||</td></tr>
<tr><td>44 160</td><td>5</td><td>0.6563</td><td>0.4844</td><td>||||||||||||||||</td><td>-0.1025</td><td>|</td></tr>
<tr><td>23 69</td><td>5</td><td>0.5533</td><td>0.3569</td><td>||||||||||||</td><td>0.3435</td><td>|||||||||||</td></tr>
<tr><td>35 109</td><td>5</td><td>0.5262</td><td>0.3570</td><td>||||||||||||</td><td>0.1228</td><td>|||||</td></tr>
<tr><td>46 166</td><td>5</td><td>0.4790</td><td>0.3085</td><td>||||||||||</td><td>0.2071</td><td>|||||||</td></tr>
<tr><td>18 53</td><td>5</td><td>0.4741</td><td>0.3558</td><td>||||||||||||</td><td>-0.1270</td><td>|</td></tr>
</table>

## Fuzzy Clustering Report

| | |
|---|---|
| Page/Date/Time | 14 4/14/2005 11:47:56 PM |
| Database | |
| Variables | StdFactor1MultSqrtEV1, StdFactor2MultSqrtEV2, StdFactor3MultSqrtEV3 |
| Distance Type | Euclidean |
| Scale Type | None |

**Membership Summary Section for Clusters = 6**

<table>
<tr><th>Row</th><th>Cluster</th><th>Cluster Membership</th><th>Sum of Squared Memberships</th><th>Bar of Squared Memberships</th><th>Silhouette Amount</th><th>Silhouette Bar</th></tr>
<tr><td>15 48</td><td>5</td><td>0.3931</td><td>0.2434</td><td>|IIIIIII</td><td>0.1591</td><td>|IIIII</td></tr>
<tr><td>19 57</td><td>5</td><td>0.3755</td><td>0.2555</td><td>|IIIIIIII</td><td>0.0657</td><td>|II</td></tr>
<tr><td>49 170</td><td>6</td><td>0.9466</td><td>0.8970</td><td>|IIIIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.7569</td><td>|IIIIIIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>25 76</td><td>6</td><td>0.9430</td><td>0.8904</td><td>|IIIIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.7204</td><td>|IIIIIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>24 70</td><td>6</td><td>0.8940</td><td>0.8024</td><td>|IIIIIIIIIIIIIIIIIIIIIIII</td><td>0.7127</td><td>|IIIIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>16 50</td><td>6</td><td>0.8493</td><td>0.7277</td><td>|IIIIIIIIIIIIIIIIIIIIII</td><td>0.6961</td><td>|IIIIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>47 167</td><td>6</td><td>0.5341</td><td>0.4241</td><td>|IIIIIIIIIIIII</td><td>0.2538</td><td>|IIIIIIII</td></tr>
</table>

**Membership Matrix Section**

| Row | Cluster | Prob in 1 | Prob in 2 | Prob in 3 | Prob in 4 | Prob in 5 | Prob in 6 |
|---|---|---|---|---|---|---|---|
| 1 5 | 2 | 0.0424 | 0.7223 | 0.0032 | 0.1808 | 0.0301 | 0.0212 |
| 2 8 | 4 | 0.2141 | 0.0735 | 0.0021 | 0.6647 | 0.0212 | 0.0243 |
| 3 9 | 1 | 0.9002 | 0.0250 | 0.0014 | 0.0477 | 0.0098 | 0.0159 |
| 4 16 | 5 | 0.0127 | 0.0205 | 0.0016 | 0.0188 | 0.8534 | 0.0930 |
| 5 17 | 4 | 0.1291 | 0.0684 | 0.0025 | 0.7441 | 0.0274 | 0.0285 |
| 6 18 | 1 | 0.6467 | 0.1731 | 0.0053 | 0.1119 | 0.0262 | 0.0368 |
| 7 23 | 5 | 0.0108 | 0.0164 | 0.0016 | 0.0160 | 0.8810 | 0.0741 |
| 8 24 | 1 | 0.9151 | 0.0212 | 0.0010 | 0.0422 | 0.0078 | 0.0126 |
| 9 25 | 2 | 0.0509 | 0.7120 | 0.0041 | 0.1894 | 0.0245 | 0.0191 |
| 10 28 | 2 | 0.0563 | 0.7477 | 0.0108 | 0.1002 | 0.0493 | 0.0357 |
| 11 30 | 3 | 0.0085 | 0.0150 | 0.9509 | 0.0090 | 0.0088 | 0.0078 |
| 12 33 | 4 | 0.0341 | 0.0397 | 0.0008 | 0.9066 | 0.0098 | 0.0089 |
| 13 44 | 1 | 0.6299 | 0.1453 | 0.0106 | 0.1006 | 0.0427 | 0.0709 |
| 14 45 | 2 | 0.0651 | 0.4442 | 0.0071 | 0.3902 | 0.0572 | 0.0362 |
| 15 48 | 5 | 0.0943 | 0.1468 | 0.0258 | 0.1746 | 0.3931 | 0.1654 |
| 16 50 | 6 | 0.0379 | 0.0233 | 0.0027 | 0.0269 | 0.0599 | 0.8493 |
| 17 51 | 1 | 0.8151 | 0.0495 | 0.0039 | 0.0669 | 0.0228 | 0.0418 |
| 18 53 | 5 | 0.0451 | 0.0767 | 0.0057 | 0.0513 | 0.4741 | 0.3470 |
| 19 57 | 5 | 0.0810 | 0.1663 | 0.0229 | 0.0851 | 0.3755 | 0.2691 |
| 20 59 | 2 | 0.1488 | 0.4345 | 0.0930 | 0.1330 | 0.0964 | 0.0943 |
| 21 62 | 1 | 0.8703 | 0.0322 | 0.0012 | 0.0715 | 0.0099 | 0.0150 |
| 22 66 | 3 | 0.0184 | 0.0288 | 0.9052 | 0.0178 | 0.0153 | 0.0146 |
| 23 69 | 5 | 0.0571 | 0.1299 | 0.0216 | 0.0889 | 0.5533 | 0.1493 |
| 24 70 | 6 | 0.0266 | 0.0181 | 0.0019 | 0.0175 | 0.0418 | 0.8940 |
| 25 76 | 6 | 0.0094 | 0.0078 | 0.0008 | 0.0079 | 0.0312 | 0.9430 |
| 26 78 | 2 | 0.1050 | 0.3371 | 0.0639 | 0.2105 | 0.1820 | 0.1015 |
| 27 79 | 4 | 0.0433 | 0.0709 | 0.0011 | 0.8612 | 0.0124 | 0.0111 |
| 28 81 | 4 | 0.0730 | 0.1207 | 0.0021 | 0.7741 | 0.0156 | 0.0144 |
| 29 88 | 2 | 0.1197 | 0.2835 | 0.0957 | 0.1193 | 0.2067 | 0.1750 |
| 30 94 | 5 | 0.0197 | 0.0269 | 0.0025 | 0.0326 | 0.8231 | 0.0952 |
| 31 96 | 1 | 0.4879 | 0.0762 | 0.0028 | 0.3754 | 0.0252 | 0.0325 |
| 32 100 | 1 | 0.8189 | 0.0599 | 0.0040 | 0.0585 | 0.0209 | 0.0378 |

## Fuzzy Clustering Report

| | |
|---|---|
| Page/Date/Time | 15 4/14/2005 11:47:56 PM |
| Database | |
| Variables | StdFactor1MultSqrtEV1, StdFactor2MultSqrtEV2, StdFactor3MultSqrtEV3 |
| Distance Type | Euclidean |
| Scale Type | None |

**Membership Matrix Section**

| Row | Cluster | Prob in 1 | Prob in 2 | Prob in 3 | Prob in 4 | Prob in 5 | Prob in 6 |
|---|---|---|---|---|---|---|---|
| 33 106 | 4 | 0.1244 | 0.2190 | 0.0256 | 0.3395 | 0.1841 | 0.1074 |
| 34 108 | 5 | 0.0176 | 0.0300 | 0.0028 | 0.0320 | 0.8518 | 0.0659 |
| 35 109 | 5 | 0.0502 | 0.1026 | 0.0096 | 0.0595 | 0.5262 | 0.2519 |
| 36 111 | 2 | 0.1674 | 0.5741 | 0.0221 | 0.1271 | 0.0526 | 0.0567 |
| 37 112 | 4 | 0.1154 | 0.0967 | 0.0048 | 0.6846 | 0.0529 | 0.0456 |
| 38 116 | 1 | 0.6144 | 0.1071 | 0.0024 | 0.2226 | 0.0226 | 0.0309 |
| 39 119 | 5 | 0.0393 | 0.0471 | 0.0045 | 0.0653 | 0.6832 | 0.1606 |
| 40 123 | 2 | 0.1427 | 0.6482 | 0.0040 | 0.1404 | 0.0308 | 0.0339 |
| 41 137 | 2 | 0.2898 | 0.4767 | 0.0047 | 0.1631 | 0.0296 | 0.0360 |
| 42 145 | 4 | 0.0455 | 0.1251 | 0.0026 | 0.7806 | 0.0272 | 0.0191 |
| 43 157 | 3 | 0.0287 | 0.0413 | 0.8400 | 0.0296 | 0.0315 | 0.0288 |
| 44 160 | 5 | 0.0336 | 0.0374 | 0.0035 | 0.0483 | 0.6563 | 0.2210 |
| 45 162 | 2 | 0.1742 | 0.6257 | 0.0042 | 0.1380 | 0.0271 | 0.0309 |
| 46 166 | 5 | 0.0618 | 0.1539 | 0.0143 | 0.0782 | 0.4790 | 0.2128 |
| 47 167 | 6 | 0.0280 | 0.0351 | 0.0029 | 0.0313 | 0.3685 | 0.5341 |
| 48 169 | 4 | 0.0526 | 0.3068 | 0.0031 | 0.5826 | 0.0323 | 0.0226 |
| 49 170 | 6 | 0.0111 | 0.0079 | 0.0008 | 0.0085 | 0.0251 | 0.9466 |

**Cluster Medoids Section**

| Variable | Cluster1 | Cluster2 | Cluster3 | Cluster4 | Cluster5 | Cluster6 | |
|---|---|---|---|---|---|---|---|
| StdFactor1MultSqrtEV1 | | -1.162144 | 0.2446604 | -1.532965E-02 | 4.386005 | -0.8342786 | - |
| 0.6451804 | | | | | | | |
| StdFactor2MultSqrtEV2 | | -0.9014585 | -0.3140762 | -0.7287101 | -0.9627987 | 1.411811 | - |
| 0.4502835 | | | | | | | |
| StdFactor3MultSqrtEV3 | | 0.1471108 | -0.5397611 | 0.1378473 | 1.013824 | -0.393572 | - |
| 0.6754565 | | | | | | | |
| Row | 8 24 | 1 5 | 45 162 | 11 30 | 30 94 | 12 33 | |

**Cluster Medoids Section**

| Variable | Cluster7 | |
|---|---|---|
| StdFactor1MultSqrtEV1 | | -1.060053 |
| StdFactor2MultSqrtEV2 | | 0.9364008 |
| StdFactor3MultSqrtEV3 | | 0.769066 |
| Row | 25 76 | |

## Fuzzy Clustering Report

Page/Date/Time 16 4/14/2005 11:47:56 PM
Database
Variables StdFactor1MultSqrtEV1, StdFactor2MultSqrtEV2, StdFactor3MultSqrtEV3
Distance Type Euclidean
Scale Type None

**Membership Summary Section for Clusters = 7**

<table>
<tr><th>Row</th><th>Cluster</th><th>Cluster Membership</th><th>Sum of Squared Memberships</th><th>Bar of Squared Memberships</th><th>Silhouette Amount</th><th>Silhouette Bar</th></tr>
<tr><td>8 24</td><td>1</td><td>0.9266</td><td>0.8603</td><td>|IIIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.3979</td><td>|IIIIIIIIIIII</td></tr>
<tr><td>3 9</td><td>1</td><td>0.9156</td><td>0.8405</td><td>|IIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.4170</td><td>|IIIIIIIIIIIII</td></tr>
<tr><td>21 62</td><td>1</td><td>0.8349</td><td>0.7067</td><td>|IIIIIIIIIIIIIIIIIIIII</td><td>0.2407</td><td>|IIIIIII</td></tr>
<tr><td>17 51</td><td>1</td><td>0.8240</td><td>0.6861</td><td>|IIIIIIIIIIIIIIIIIIIII</td><td>0.5028</td><td>|IIIIIIIIIIIIIII</td></tr>
<tr><td>32 100</td><td>1</td><td>0.7838</td><td>0.6258</td><td>|IIIIIIIIIIIIIIIIIII</td><td>0.5647</td><td>|IIIIIIIIIIIIIIIII</td></tr>
<tr><td>13 44</td><td>1</td><td>0.5063</td><td>0.3271</td><td>|IIIIIIIIII</td><td>0.4416</td><td>|IIIIIIIIIIIII</td></tr>
<tr><td>38 116</td><td>1</td><td>0.4699</td><td>0.3229</td><td>|IIIIIIIIII</td><td>-0.0516</td><td>|</td></tr>
<tr><td>6 18</td><td>1</td><td>0.4591</td><td>0.3207</td><td>|IIIIIIIIII</td><td>0.3919</td><td>|IIIIIIIIIIII</td></tr>
<tr><td>1 5</td><td>2</td><td>0.8227</td><td>0.6866</td><td>|IIIIIIIIIIIIIIIIIIIII</td><td>0.0482</td><td>|I</td></tr>
<tr><td>14 45</td><td>2</td><td>0.8199</td><td>0.6818</td><td>|IIIIIIIIIIIIIIIIIIII</td><td>0.2059</td><td>|IIIIII</td></tr>
<tr><td>48 169</td><td>2</td><td>0.7988</td><td>0.6541</td><td>|IIIIIIIIIIIIIIIIIIII</td><td>-0.1427</td><td>|</td></tr>
<tr><td>9 25</td><td>2</td><td>0.7567</td><td>0.5919</td><td>|IIIIIIIIIIIIIIIIII</td><td>0.0376</td><td>|I</td></tr>
<tr><td>42 145</td><td>2</td><td>0.4607</td><td>0.3751</td><td>|IIIIIIIIIII</td><td>-0.3247</td><td>|</td></tr>
<tr><td>26 78</td><td>2</td><td>0.3336</td><td>0.1968</td><td>|IIIIII</td><td>0.2412</td><td>|IIIIIII</td></tr>
<tr><td>33 106</td><td>2</td><td>0.2910</td><td>0.1953</td><td>|IIIIII</td><td>0.0682</td><td>|II</td></tr>
<tr><td>45 162</td><td>3</td><td>0.7925</td><td>0.6393</td><td>|IIIIIIIIIIIIIIIIIII</td><td>-0.0073</td><td>|</td></tr>
<tr><td>40 123</td><td>3</td><td>0.7315</td><td>0.5542</td><td>|IIIIIIIIIIIIIIIII</td><td>0.0414</td><td>|I</td></tr>
<tr><td>36 111</td><td>3</td><td>0.7056</td><td>0.5178</td><td>|IIIIIIIIIIIIIIII</td><td>0.3044</td><td>|IIIIIIIII</td></tr>
<tr><td>41 137</td><td>3</td><td>0.6805</td><td>0.4912</td><td>|IIIIIIIIIIIIIII</td><td>-0.1929</td><td>|</td></tr>
<tr><td>20 59</td><td>3</td><td>0.5013</td><td>0.2977</td><td>|IIIIIIIII</td><td>0.3890</td><td>|IIIIIIIIIIII</td></tr>
<tr><td>10 28</td><td>3</td><td>0.4363</td><td>0.3204</td><td>|IIIIIIIIII</td><td>0.1070</td><td>|III</td></tr>
<tr><td>29 88</td><td>3</td><td>0.3013</td><td>0.1779</td><td>|IIIII</td><td>0.0947</td><td>|III</td></tr>
<tr><td>11 30</td><td>4</td><td>0.9430</td><td>0.8898</td><td>|IIIIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.4658</td><td>|IIIIIIIIIIIIII</td></tr>
<tr><td>22 66</td><td>4</td><td>0.8885</td><td>0.7917</td><td>|IIIIIIIIIIIIIIIIIIIIIIII</td><td>0.4088</td><td>|IIIIIIIIIIII</td></tr>
<tr><td>43 157</td><td>4</td><td>0.8099</td><td>0.6622</td><td>|IIIIIIIIIIIIIIIIIIII</td><td>0.5227</td><td>|IIIIIIIIIIIIIIII</td></tr>
<tr><td>30 94</td><td>5</td><td>0.9201</td><td>0.8484</td><td>|IIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.3693</td><td>|IIIIIIIIIII</td></tr>
<tr><td>7 23</td><td>5</td><td>0.8971</td><td>0.8087</td><td>|IIIIIIIIIIIIIIIIIIIIIIII</td><td>0.2468</td><td>|IIIIIII</td></tr>
<tr><td>34 108</td><td>5</td><td>0.8864</td><td>0.7888</td><td>|IIIIIIIIIIIIIIIIIIIIIIII</td><td>0.4169</td><td>|IIIIIIIIIIIII</td></tr>
<tr><td>4 16</td><td>5</td><td>0.8074</td><td>0.6666</td><td>|IIIIIIIIIIIIIIIIIIII</td><td>0.0933</td><td>|III</td></tr>
<tr><td>39 119</td><td>5</td><td>0.7989</td><td>0.6490</td><td>|IIIIIIIIIIIIIIIIIII</td><td>0.3162</td><td>|IIIIIIIII</td></tr>
<tr><td>44 160</td><td>5</td><td>0.7683</td><td>0.6100</td><td>|IIIIIIIIIIIIIIIIII</td><td>0.1592</td><td>|IIIII</td></tr>
<tr><td>23 69</td><td>5</td><td>0.4194</td><td>0.2467</td><td>|IIIIIII</td><td>0.2078</td><td>|IIIIII</td></tr>
<tr><td>15 48</td><td>5</td><td>0.3727</td><td>0.2173</td><td>|IIIIIII</td><td>0.2342</td><td>|IIIIIII</td></tr>
<tr><td>46 166</td><td>5</td><td>0.2983</td><td>0.2133</td><td>|IIIIII</td><td>-0.2509</td><td>|</td></tr>
<tr><td>12 33</td><td>6</td><td>0.8965</td><td>0.8070</td><td>|IIIIIIIIIIIIIIIIIIIIIIII</td><td>0.6390</td><td>|IIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>5 17</td><td>6</td><td>0.8394</td><td>0.7114</td><td>|IIIIIIIIIIIIIIIIIIIII</td><td>0.6078</td><td>|IIIIIIIIIIIIIIIIII</td></tr>
<tr><td>2 8</td><td>6</td><td>0.8154</td><td>0.6761</td><td>|IIIIIIIIIIIIIIIIIIII</td><td>0.5249</td><td>|IIIIIIIIIIIIIIII</td></tr>
<tr><td>27 79</td><td>6</td><td>0.7704</td><td>0.6123</td><td>|IIIIIIIIIIIIIIIIII</td><td>0.5432</td><td>|IIIIIIIIIIIIIIII</td></tr>
<tr><td>37 112</td><td>6</td><td>0.6710</td><td>0.4762</td><td>|IIIIIIIIIIIIII</td><td>0.5285</td><td>|IIIIIIIIIIIIIIII</td></tr>
<tr><td>28 81</td><td>6</td><td>0.6363</td><td>0.4534</td><td>|IIIIIIIIIIIIII</td><td>0.4789</td><td>|IIIIIIIIIIIIII</td></tr>
<tr><td>31 96</td><td>6</td><td>0.5266</td><td>0.3894</td><td>|IIIIIIIIIIII</td><td>0.2636</td><td>|IIIIIIII</td></tr>
<tr><td>25 76</td><td>7</td><td>0.9316</td><td>0.8691</td><td>|IIIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.4965</td><td>|IIIIIIIIIIIIIII</td></tr>
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## Fuzzy Clustering Report

Page/Date/Time 17 4/14/2005 11:47:57 PM
Database
Variables StdFactor1MultSqrtEV1, StdFactor2MultSqrtEV2, StdFactor3MultSqrtEV3
Distance Type Euclidean
Scale Type None

**Membership Summary Section for Clusters = 7**

<table>
<tr><th>Row</th><th>Cluster</th><th>Cluster Membership</th><th>Sum of Squared Memberships</th><th>Bar of Squared Memberships</th><th>Silhouette Amount</th><th>Silhouette Bar</th></tr>
<tr><td>49 170</td><td>7</td><td>0.9195</td><td>0.8471</td><td>|IIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.4889</td><td>|IIIIIIIIIIIIIII</td></tr>
<tr><td>24 70</td><td>7</td><td>0.8713</td><td>0.7627</td><td>|IIIIIIIIIIIIIIIIIIIIIII</td><td>0.5042</td><td>|IIIIIIIIIIIIIII</td></tr>
<tr><td>16 50</td><td>7</td><td>0.7850</td><td>0.6267</td><td>|IIIIIIIIIIIIIIIIIII</td><td>0.4328</td><td>|IIIIIIIIIIIII</td></tr>
<tr><td>47 167</td><td>7</td><td>0.6144</td><td>0.4540</td><td>|IIIIIIIIIIIIII</td><td>0.2798</td><td>|IIIIIIII</td></tr>
<tr><td>18 53</td><td>7</td><td>0.4974</td><td>0.3314</td><td>|IIIIIIIIII</td><td>0.2981</td><td>|IIIIIIIII</td></tr>
<tr><td>35 109</td><td>7</td><td>0.3640</td><td>0.2574</td><td>|IIIIIIII</td><td>0.1851</td><td>|IIIIII</td></tr>
<tr><td>19 57</td><td>7</td><td>0.3170</td><td>0.2061</td><td>|IIIIII</td><td>0.2123</td><td>|IIIIII</td></tr>
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**Membership Matrix Section**

| Row | Cluster | Prob in 1 | Prob in 2 | Prob in 3 | Prob in 4 | Prob in 5 | Prob in 6 |
|---|---|---|---|---|---|---|---|
| 1 5 | 2 | 0.0181 | 0.8227 | 0.0775 | 0.0016 | 0.0127 | 0.0564 |
| 2 8 | 6 | 0.0926 | 0.0405 | 0.0285 | 0.0011 | 0.0102 | 0.8154 |
| 3 9 | 1 | 0.9156 | 0.0122 | 0.0176 | 0.0008 | 0.0057 | 0.0385 |
| 4 16 | 5 | 0.0134 | 0.0227 | 0.0203 | 0.0018 | 0.8074 | 0.0196 |
| 5 17 | 6 | 0.0600 | 0.0463 | 0.0250 | 0.0013 | 0.0140 | 0.8394 |
| 6 18 | 1 | 0.4591 | 0.0735 | 0.3034 | 0.0048 | 0.0209 | 0.1046 |
| 7 23 | 5 | 0.0078 | 0.0128 | 0.0109 | 0.0012 | 0.8971 | 0.0114 |
| 8 24 | 1 | 0.9266 | 0.0103 | 0.0152 | 0.0006 | 0.0046 | 0.0351 |
| 9 25 | 2 | 0.0272 | 0.7567 | 0.1108 | 0.0026 | 0.0134 | 0.0771 |
| 10 28 | 3 | 0.0504 | 0.3433 | 0.4363 | 0.0111 | 0.0404 | 0.0793 |
| 11 30 | 4 | 0.0076 | 0.0113 | 0.0155 | 0.9430 | 0.0072 | 0.0078 |
| 12 33 | 6 | 0.0222 | 0.0495 | 0.0174 | 0.0006 | 0.0071 | 0.8965 |
| 13 44 | 1 | 0.5063 | 0.0690 | 0.2295 | 0.0092 | 0.0327 | 0.0914 |
| 14 45 | 2 | 0.0198 | 0.8199 | 0.0477 | 0.0024 | 0.0178 | 0.0798 |
| 15 48 | 5 | 0.0768 | 0.1600 | 0.0957 | 0.0218 | 0.3727 | 0.1365 |
| 16 50 | 7 | 0.0469 | 0.0249 | 0.0313 | 0.0033 | 0.0732 | 0.0353 |
| 17 51 | 1 | 0.8240 | 0.0263 | 0.0452 | 0.0028 | 0.0155 | 0.0573 |
| 18 53 | 7 | 0.0425 | 0.0609 | 0.0816 | 0.0057 | 0.2635 | 0.0484 |
| 19 57 | 7 | 0.0719 | 0.1110 | 0.1878 | 0.0216 | 0.2164 | 0.0742 |
| 20 59 | 3 | 0.0917 | 0.1411 | 0.5013 | 0.0629 | 0.0542 | 0.0810 |
| 21 62 | 1 | 0.8349 | 0.0217 | 0.0326 | 0.0010 | 0.0082 | 0.0886 |
| 22 66 | 4 | 0.0166 | 0.0214 | 0.0305 | 0.8885 | 0.0129 | 0.0159 |
| 23 69 | 5 | 0.0559 | 0.1356 | 0.1153 | 0.0223 | 0.4194 | 0.0821 |
| 24 70 | 7 | 0.0283 | 0.0155 | 0.0228 | 0.0020 | 0.0405 | 0.0197 |
| 25 76 | 7 | 0.0102 | 0.0073 | 0.0094 | 0.0009 | 0.0318 | 0.0089 |
| 26 78 | 2 | 0.0788 | 0.3336 | 0.1816 | 0.0514 | 0.1302 | 0.1404 |
| 27 79 | 6 | 0.0388 | 0.1234 | 0.0421 | 0.0011 | 0.0124 | 0.7704 |
| 28 81 | 6 | 0.0637 | 0.1978 | 0.0702 | 0.0022 | 0.0151 | 0.6363 |
| 29 88 | 3 | 0.0925 | 0.1480 | 0.3013 | 0.0786 | 0.1295 | 0.0900 |
| 30 94 | 5 | 0.0077 | 0.0124 | 0.0091 | 0.0010 | 0.9201 | 0.0127 |
| 31 96 | 6 | 0.3249 | 0.0543 | 0.0514 | 0.0020 | 0.0178 | 0.5266 |
| 32 100 | 1 | 0.7838 | 0.0315 | 0.0780 | 0.0034 | 0.0162 | 0.0557 |

**Fuzzy Clustering Report**

| | |
|---|---|
| Page/Date/Time | 18 4/14/2005 11:47:57 PM |
| Database | |
| Variables | StdFactor1MultSqrtEV1, StdFactor2MultSqrtEV2, StdFactor3MultSqrtEV3 |
| Distance Type | Euclidean |
| Scale Type | None |

**Membership Matrix Section**

| Row | Cluster | Prob in 1 | Prob in 2 | Prob in 3 | Prob in 4 | Prob in 5 | Prob in 6 |
|---|---|---|---|---|---|---|---|
| 33 106 | 2 | 0.0952 | 0.2910 | 0.1168 | 0.0207 | 0.1523 | 0.2389 |
| 34 108 | 5 | 0.0109 | 0.0228 | 0.0154 | 0.0018 | 0.8864 | 0.0191 |
| 35 109 | 7 | 0.0511 | 0.0865 | 0.1157 | 0.0105 | 0.3126 | 0.0595 |
| 36 111 | 3 | 0.0738 | 0.0976 | 0.7056 | 0.0115 | 0.0232 | 0.0579 |
| 37 112 | 6 | 0.0816 | 0.1177 | 0.0513 | 0.0037 | 0.0414 | 0.6710 |
| 38 116 | 1 | 0.4699 | 0.0735 | 0.1192 | 0.0023 | 0.0203 | 0.2850 |
| 39 119 | 5 | 0.0217 | 0.0317 | 0.0226 | 0.0026 | 0.7989 | 0.0367 |
| 40 123 | 3 | 0.0639 | 0.0983 | 0.7315 | 0.0023 | 0.0151 | 0.0687 |
| 41 137 | 3 | 0.1190 | 0.0799 | 0.6805 | 0.0026 | 0.0143 | 0.0834 |
| 42 145 | 2 | 0.0393 | 0.4607 | 0.0566 | 0.0026 | 0.0256 | 0.3963 |
| 43 157 | 4 | 0.0274 | 0.0355 | 0.0419 | 0.8099 | 0.0287 | 0.0277 |
| 44 160 | 5 | 0.0206 | 0.0258 | 0.0210 | 0.0022 | 0.7683 | 0.0306 |
| 45 162 | 3 | 0.0591 | 0.0679 | 0.7925 | 0.0019 | 0.0105 | 0.0539 |
| 46 166 | 5 | 0.0597 | 0.1218 | 0.1572 | 0.0149 | 0.2983 | 0.0732 |
| 47 167 | 7 | 0.0244 | 0.0281 | 0.0317 | 0.0027 | 0.2709 | 0.0279 |
| 48 169 | 2 | 0.0186 | 0.7988 | 0.0431 | 0.0013 | 0.0122 | 0.1164 |
| 49 170 | 7 | 0.0146 | 0.0090 | 0.0114 | 0.0011 | 0.0324 | 0.0119 |

## Fuzzy Clustering Report

| | |
|---|---|
| Page/Date/Time | 19 4/14/2005 11:47:57 PM |
| Database | |
| Variables | StdFactor1MultSqrtEV1, StdFactor2MultSqrtEV2, StdFactor3MultSqrtEV3 |
| Distance Type | Euclidean |
| Scale Type | None |

**Membership Matrix Section**

| Row | Cluster | Prob in 7 |
|---|---|---|
| 1 5 | 2 | 0.0110 |
| 2 8 | 6 | 0.0118 |
| 3 9 | 1 | 0.0094 |
| 4 16 | 5 | 0.1149 |
| 5 17 | 6 | 0.0140 |
| 6 18 | 1 | 0.0336 |
| 7 23 | 5 | 0.0588 |
| 8 24 | 1 | 0.0076 |
| 9 25 | 2 | 0.0123 |
| 10 28 | 3 | 0.0392 |
| 11 30 | 4 | 0.0075 |
| 12 33 | 6 | 0.0066 |
| 13 44 | 1 | 0.0619 |
| 14 45 | 2 | 0.0126 |
| 15 48 | 5 | 0.1365 |
| 16 50 | 7 | 0.7850 |
| 17 51 | 1 | 0.0290 |
| 18 53 | 7 | 0.4974 |
| 19 57 | 7 | 0.3170 |
| 20 59 | 3 | 0.0678 |
| 21 62 | 1 | 0.0129 |
| 22 66 | 4 | 0.0141 |
| 23 69 | 5 | 0.1693 |
| 24 70 | 7 | 0.8713 |
| 25 76 | 7 | 0.9316 |
| 26 78 | 2 | 0.0839 |
| 27 79 | 6 | 0.0118 |
| 28 81 | 6 | 0.0148 |
| 29 88 | 3 | 0.1600 |
| 30 94 | 5 | 0.0370 |
| 31 96 | 6 | 0.0229 |
| 32 100 | 1 | 0.0315 |
| 33 106 | 2 | 0.0852 |
| 34 108 | 5 | 0.0436 |
| 35 109 | 7 | 0.3640 |
| 36 111 | 3 | 0.0304 |
| 37 112 | 6 | 0.0335 |
| 38 116 | 1 | 0.0298 |
| 39 119 | 5 | 0.0858 |
| 40 123 | 3 | 0.0202 |
| 41 137 | 3 | 0.0203 |
| 42 145 | 2 | 0.0189 |
| 43 157 | 4 | 0.0290 |
| 44 160 | 5 | 0.1315 |

## Fuzzy Clustering Report

| | |
|---|---|
| Page/Date/Time | 20 4/14/2005 11:47:57 PM |
| Database | |
| Variables | StdFactor1MultSqrtEV1, StdFactor2MultSqrtEV2, StdFactor3MultSqrtEV3 |
| Distance Type | Euclidean |
| Scale Type | None |

**Membership Matrix Section**

| Row | Cluster | Prob in 7 |
|---|---|---|
| 45 162 | 3 | 0.0142 |
| 46 166 | 5 | 0.2750 |
| 47 167 | 7 | 0.6144 |
| 48 169 | 2 | 0.0095 |
| 49 170 | 7 | 0.9195 |

**Cluster Medoids Section**

| Variable | Cluster1 | Cluster2 | Cluster3 | Cluster4 | Cluster5 | Cluster6 | |
|---|---|---|---|---|---|---|---|
| StdFactor1MultSqrtEV1 | | -1.162144 | 0.2446604 | -1.266775 | 4.386005 | -0.8342786 | - |
| 1.532965E-02 | | | | | | | |
| StdFactor2MultSqrtEV2 | | -0.9014585 | -0.3140762 | 0.8357013 | -0.9627987 | 1.411811 | - |
| 0.7287101 | | | | | | | |
| StdFactor3MultSqrtEV3 | | 0.1471108 | -0.5397611 | 0.7857837 | 1.013824 | -0.393572 | |
| | 0.1378473 | | | | | | |
| Row | 8 24 | 1 5 | 49 170 | 11 30 | 30 94 | 45 162 | |

**Cluster Medoids Section**

| Variable | Cluster7 | Cluster8 | |
|---|---|---|---|
| StdFactor1MultSqrtEV1 | | -0.6451804 | 0.491393 |
| StdFactor2MultSqrtEV2 | | -0.4502835 | 1.097219 |
| StdFactor3MultSqrtEV3 | | -0.6754565 | 0.4916685 |
| Row | 12 33 | 46 166 | |

**Membership Summary Section for Clusters = 8**

<table>
<tr><th>Row</th><th>Cluster</th><th>Cluster Membership</th><th>Sum of Squared Memberships</th><th>Bar of Squared Memberships</th><th>Silhouette Amount</th><th>Silhouette Bar</th></tr>
<tr><td>8 24</td><td>1</td><td>0.9478</td><td>0.8990</td><td>|IIIIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.4837</td><td>|IIIIIIIIIIIIIII</td></tr>
<tr><td>3 9</td><td>1</td><td>0.9381</td><td>0.8809</td><td>|IIIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.5002</td><td>|IIIIIIIIIIIIIII</td></tr>
<tr><td>21 62</td><td>1</td><td>0.8517</td><td>0.7320</td><td>|IIIIIIIIIIIIIIIIIIIIII</td><td>0.3291</td><td>|IIIIIIIIII</td></tr>
<tr><td>17 51</td><td>1</td><td>0.8153</td><td>0.6719</td><td>|IIIIIIIIIIIIIIIIIIII</td><td>0.5564</td><td>|IIIIIIIIIIIIIIIII</td></tr>
<tr><td>32 100</td><td>1</td><td>0.7252</td><td>0.5450</td><td>|IIIIIIIIIIIIIIII</td><td>0.5162</td><td>|IIIIIIIIIIIIIII</td></tr>
<tr><td>38 116</td><td>1</td><td>0.4294</td><td>0.2885</td><td>|IIIIIIIII</td><td>0.0028</td><td>|</td></tr>
<tr><td>13 44</td><td>1</td><td>0.4149</td><td>0.2775</td><td>|IIIIIIII</td><td>0.2022</td><td>|IIIIII</td></tr>
<tr><td>1 5</td><td>2</td><td>0.8505</td><td>0.7293</td><td>|IIIIIIIIIIIIIIIIIIIIII</td><td>0.0089</td><td>|</td></tr>
<tr><td>14 45</td><td>2</td><td>0.8200</td><td>0.6813</td><td>|IIIIIIIIIIIIIIIIIIII</td><td>0.0624</td><td>|II</td></tr>
<tr><td>9 25</td><td>2</td><td>0.8051</td><td>0.6592</td><td>|IIIIIIIIIIIIIIIIIIII</td><td>0.0012</td><td>|</td></tr>
<tr><td>48 169</td><td>2</td><td>0.7761</td><td>0.6216</td><td>|IIIIIIIIIIIIIIIIIII</td><td>-0.2934</td><td>|</td></tr>
<tr><td>10 28</td><td>2</td><td>0.4591</td><td>0.2884</td><td>|IIIIIIIII</td><td>-0.1396</td><td>|</td></tr>
<tr><td>26 78</td><td>2</td><td>0.3167</td><td>0.1750</td><td>|IIIII</td><td>0.2812</td><td>|IIIIIIII</td></tr>
<tr><td>33 106</td><td>2</td><td>0.2615</td><td>0.1736</td><td>|IIIII</td><td>-0.0443</td><td>|</td></tr>
<tr><td>49 170</td><td>3</td><td>0.9812</td><td>0.9628</td><td>|IIIIIIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.7459</td><td>|IIIIIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>25 76</td><td>3</td><td>0.9519</td><td>0.9067</td><td>|IIIIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.7146</td><td>|IIIIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>24 70</td><td>3</td><td>0.9324</td><td>0.8703</td><td>|IIIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.7174</td><td>|IIIIIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>16 50</td><td>3</td><td>0.9160</td><td>0.8404</td><td>|IIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.6780</td><td>|IIIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>47 167</td><td>3</td><td>0.3430</td><td>0.2587</td><td>|IIIIIIII</td><td>0.2551</td><td>|IIIIIIII</td></tr>
<tr><td>11 30</td><td>4</td><td>0.9399</td><td>0.8840</td><td>|IIIIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.5039</td><td>|IIIIIIIIIIIIIII</td></tr>
</table>

**Fuzzy Clustering Report**

| | |
|---|---|
| Page/Date/Time | 21 4/14/2005 11:47:57 PM |
| Database | |
| Variables | StdFactor1MultSqrtEV1, StdFactor2MultSqrtEV2, StdFactor3MultSqrtEV3 |
| Distance Type | Euclidean |
| Scale Type | None |

**Membership Summary Section for Clusters = 8**

<table>
<tr><th>Row</th><th>Cluster</th><th>Cluster Membership</th><th>Sum of Squared Memberships</th><th>Bar of Squared Memberships</th><th>Silhouette Amount</th><th>Silhouette Bar</th></tr>
<tr><td>22 66</td><td>4</td><td>0.8840</td><td>0.7835</td><td>|IIIIIIIIIIIIIIIIIIIIIIII</td><td>0.4321</td><td>|IIIIIIIIIIIII</td></tr>
<tr><td>43 157</td><td>4</td><td>0.7815</td><td>0.6177</td><td>|IIIIIIIIIIIIIIIIIII</td><td>0.5362</td><td>|IIIIIIIIIIIIIIII</td></tr>
<tr><td>30 94</td><td>5</td><td>0.9532</td><td>0.9090</td><td>|IIIIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.5137</td><td>|IIIIIIIIIIIIIII</td></tr>
<tr><td>34 108</td><td>5</td><td>0.8786</td><td>0.7748</td><td>|IIIIIIIIIIIIIIIIIIIIIII</td><td>0.5297</td><td>|IIIIIIIIIIIIIIII</td></tr>
<tr><td>7 23</td><td>5</td><td>0.8728</td><td>0.7658</td><td>|IIIIIIIIIIIIIIIIIIIIIII</td><td>0.3656</td><td>|IIIIIIIIIII</td></tr>
<tr><td>39 119</td><td>5</td><td>0.8609</td><td>0.7448</td><td>|IIIIIIIIIIIIIIIIIIIIII</td><td>0.4437</td><td>|IIIIIIIIIIIII</td></tr>
<tr><td>44 160</td><td>5</td><td>0.8324</td><td>0.6997</td><td>|IIIIIIIIIIIIIIIIIIIII</td><td>0.2482</td><td>|IIIIIII</td></tr>
<tr><td>4 16</td><td>5</td><td>0.7352</td><td>0.5597</td><td>|IIIIIIIIIIIIIIIII</td><td>0.2111</td><td>|IIIIII</td></tr>
<tr><td>15 48</td><td>5</td><td>0.3463</td><td>0.1912</td><td>|IIIIII</td><td>0.3175</td><td>|IIIIIIIIII</td></tr>
<tr><td>45 162</td><td>6</td><td>0.9463</td><td>0.8961</td><td>|IIIIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.3683</td><td>|IIIIIIIIIII</td></tr>
<tr><td>41 137</td><td>6</td><td>0.9207</td><td>0.8492</td><td>|IIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.2617</td><td>|IIIIIIII</td></tr>
<tr><td>40 123</td><td>6</td><td>0.8843</td><td>0.7852</td><td>|IIIIIIIIIIIIIIIIIIIIIIII</td><td>0.3243</td><td>|IIIIIIIIII</td></tr>
<tr><td>36 111</td><td>6</td><td>0.5583</td><td>0.3510</td><td>|IIIIIIIIIII</td><td>0.4475</td><td>|IIIIIIIIIIIII</td></tr>
<tr><td>6 18</td><td>6</td><td>0.5279</td><td>0.3665</td><td>|IIIIIIIIIII</td><td>-0.1864</td><td>|</td></tr>
<tr><td>20 59</td><td>6</td><td>0.3054</td><td>0.1730</td><td>|IIIII</td><td>0.3211</td><td>|IIIIIIIIII</td></tr>
<tr><td>12 33</td><td>7</td><td>0.9115</td><td>0.8329</td><td>|IIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.6391</td><td>|IIIIIIIIIIIIIIIIIII</td></tr>
<tr><td>5 17</td><td>7</td><td>0.8306</td><td>0.6968</td><td>|IIIIIIIIIIIIIIIIIIIII</td><td>0.5599</td><td>|IIIIIIIIIIIIIIIII</td></tr>
<tr><td>27 79</td><td>7</td><td>0.7862</td><td>0.6320</td><td>|IIIIIIIIIIIIIIIIIII</td><td>0.5706</td><td>|IIIIIIIIIIIIIIIII</td></tr>
<tr><td>2 8</td><td>7</td><td>0.7749</td><td>0.6162</td><td>|IIIIIIIIIIIIIIIIII</td><td>0.4519</td><td>|IIIIIIIIIIIIII</td></tr>
<tr><td>37 112</td><td>7</td><td>0.6800</td><td>0.4837</td><td>|IIIIIIIIIIIIIII</td><td>0.5415</td><td>|IIIIIIIIIIIIIIII</td></tr>
<tr><td>28 81</td><td>7</td><td>0.6495</td><td>0.4617</td><td>|IIIIIIIIIIIIII</td><td>0.5301</td><td>|IIIIIIIIIIIIIIII</td></tr>
<tr><td>31 96</td><td>7</td><td>0.4595</td><td>0.3538</td><td>|IIIIIIIIIII</td><td>0.1445</td><td>|IIII</td></tr>
<tr><td>42 145</td><td>7</td><td>0.4519</td><td>0.3648</td><td>|IIIIIIIIIII</td><td>0.3585</td><td>|IIIIIIIIIII</td></tr>
<tr><td>46 166</td><td>8</td><td>0.9445</td><td>0.8927</td><td>|IIIIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.5028</td><td>|IIIIIIIIIIIIIII</td></tr>
<tr><td>35 109</td><td>8</td><td>0.9403</td><td>0.8848</td><td>|IIIIIIIIIIIIIIIIIIIIIIIIIII</td><td>0.3856</td><td>|IIIIIIIIIIII</td></tr>
<tr><td>19 57</td><td>8</td><td>0.8749</td><td>0.7681</td><td>|IIIIIIIIIIIIIIIIIIIIIII</td><td>0.4668</td><td>|IIIIIIIIIIIIII</td></tr>
<tr><td>18 53</td><td>8</td><td>0.6677</td><td>0.4718</td><td>|IIIIIIIIIIIIII</td><td>-0.0490</td><td>|</td></tr>
<tr><td>23 69</td><td>8</td><td>0.4064</td><td>0.2485</td><td>|IIIIIII</td><td>0.0724</td><td>|II</td></tr>
<tr><td>29 88</td><td>8</td><td>0.4004</td><td>0.2163</td><td>|IIIIII</td><td>0.2438</td><td>|IIIIIII</td></tr>
</table>

## Fuzzy Clustering Report

Page/Date/Time 22 4/14/2005 11:47:57 PM
Database
Variables StdFactor1MultSqrtEV1, StdFactor2MultSqrtEV2, StdFactor3MultSqrtEV3
Distance Type Euclidean
Scale Type None

**Membership Matrix Section**

| Row | Cluster | Prob in 1 | Prob in 2 | Prob in 3 | Prob in 4 | Prob in 5 | Prob in 6 |
|---|---|---|---|---|---|---|---|
| 1 5 | 2 | 0.0145 | 0.8505 | 0.0067 | 0.0014 | 0.0098 | 0.0561 |
| 2 8 | 7 | 0.1091 | 0.0402 | 0.0114 | 0.0012 | 0.0110 | 0.0442 |
| 3 9 | 1 | 0.9381 | 0.0076 | 0.0061 | 0.0006 | 0.0037 | 0.0171 |
| 4 16 | 5 | 0.0155 | 0.0248 | 0.0652 | 0.0022 | 0.7352 | 0.0197 |
| 5 17 | 7 | 0.0624 | 0.0406 | 0.0121 | 0.0013 | 0.0136 | 0.0308 |
| 6 18 | 6 | 0.2789 | 0.0558 | 0.0225 | 0.0038 | 0.0151 | 0.5279 |
| 7 23 | 5 | 0.0082 | 0.0127 | 0.0347 | 0.0013 | 0.8728 | 0.0098 |
| 8 24 | 1 | 0.9478 | 0.0063 | 0.0047 | 0.0004 | 0.0029 | 0.0146 |
| 9 25 | 2 | 0.0206 | 0.8051 | 0.0075 | 0.0021 | 0.0099 | 0.0795 |
| 10 28 | 2 | 0.0515 | 0.4591 | 0.0300 | 0.0123 | 0.0388 | 0.2420 |
| 11 30 | 4 | 0.0070 | 0.0110 | 0.0060 | 0.9399 | 0.0064 | 0.0113 |
| 12 33 | 7 | 0.0188 | 0.0364 | 0.0046 | 0.0005 | 0.0058 | 0.0183 |
| 13 44 | 1 | 0.4149 | 0.0663 | 0.0554 | 0.0092 | 0.0299 | 0.2964 |
| 14 45 | 2 | 0.0182 | 0.8200 | 0.0091 | 0.0024 | 0.0157 | 0.0398 |
| 15 48 | 5 | 0.0691 | 0.1369 | 0.1003 | 0.0199 | 0.3463 | 0.0771 |
| 16 50 | 3 | 0.0153 | 0.0077 | 0.9160 | 0.0011 | 0.0237 | 0.0103 |
| 17 51 | 1 | 0.8153 | 0.0231 | 0.0270 | 0.0026 | 0.0138 | 0.0553 |
| 18 53 | 8 | 0.0233 | 0.0322 | 0.1005 | 0.0034 | 0.1107 | 0.0355 |
| 19 57 | 8 | 0.0120 | 0.0184 | 0.0281 | 0.0038 | 0.0288 | 0.0214 |
| 20 59 | 6 | 0.1000 | 0.1732 | 0.0614 | 0.0745 | 0.0564 | 0.3054 |
| 21 62 | 1 | 0.8517 | 0.0169 | 0.0099 | 0.0009 | 0.0066 | 0.0420 |
| 22 66 | 4 | 0.0153 | 0.0207 | 0.0116 | 0.8840 | 0.0114 | 0.0235 |
| 23 69 | 8 | 0.0399 | 0.0944 | 0.0776 | 0.0166 | 0.2431 | 0.0624 |
| 24 70 | 3 | 0.0117 | 0.0062 | 0.9324 | 0.0009 | 0.0159 | 0.0092 |
| 25 76 | 3 | 0.0056 | 0.0039 | 0.9519 | 0.0005 | 0.0167 | 0.0049 |
| 26 78 | 2 | 0.0713 | 0.3167 | 0.0605 | 0.0481 | 0.1111 | 0.1279 |
| 27 79 | 7 | 0.0352 | 0.1000 | 0.0088 | 0.0011 | 0.0109 | 0.0491 |
| 28 81 | 7 | 0.0580 | 0.1705 | 0.0114 | 0.0020 | 0.0134 | 0.0832 |
| 29 88 | 8 | 0.0655 | 0.1090 | 0.0825 | 0.0593 | 0.0816 | 0.1361 |
| 30 94 | 5 | 0.0041 | 0.0061 | 0.0135 | 0.0006 | 0.9532 | 0.0043 |
| 31 96 | 7 | 0.3665 | 0.0499 | 0.0207 | 0.0021 | 0.0173 | 0.0708 |
| 32 100 | 1 | 0.7252 | 0.0323 | 0.0322 | 0.0036 | 0.0163 | 0.1151 |
| 33 106 | 2 | 0.0895 | 0.2615 | 0.0681 | 0.0196 | 0.1442 | 0.1027 |
| 34 108 | 5 | 0.0095 | 0.0187 | 0.0249 | 0.0016 | 0.8786 | 0.0117 |
| 35 109 | 8 | 0.0045 | 0.0074 | 0.0140 | 0.0010 | 0.0199 | 0.0076 |
| 36 111 | 6 | 0.0915 | 0.1404 | 0.0330 | 0.0159 | 0.0285 | 0.5583 |
| 37 112 | 7 | 0.0775 | 0.0993 | 0.0274 | 0.0034 | 0.0387 | 0.0527 |
| 38 116 | 1 | 0.4294 | 0.0658 | 0.0247 | 0.0023 | 0.0185 | 0.1963 |
| 39 119 | 5 | 0.0138 | 0.0186 | 0.0419 | 0.0017 | 0.8609 | 0.0133 |
| 40 123 | 6 | 0.0242 | 0.0410 | 0.0066 | 0.0010 | 0.0058 | 0.8843 |
| 41 137 | 6 | 0.0262 | 0.0200 | 0.0042 | 0.0007 | 0.0034 | 0.9207 |
| 42 145 | 7 | 0.0382 | 0.3934 | 0.0149 | 0.0026 | 0.0242 | 0.0572 |
| 43 157 | 4 | 0.0267 | 0.0355 | 0.0257 | 0.7815 | 0.0270 | 0.0362 |
| 44 160 | 5 | 0.0145 | 0.0169 | 0.0686 | 0.0016 | 0.8324 | 0.0137 |

**Fuzzy Clustering Report**

| | |
|---|---|
| Page/Date/Time | 23 4/14/2005 11:47:57 PM |
| Database | |
| Variables | StdFactor1MultSqrtEV1, StdFactor2MultSqrtEV2, StdFactor3MultSqrtEV3 |
| Distance Type | Euclidean |
| Scale Type | None |

**Membership Matrix Section**

| Row | Cluster | Prob in 1 | Prob in 2 | Prob in 3 | Prob in 4 | Prob in 5 | Prob in 6 |
|---|---|---|---|---|---|---|---|
| 45 162 | 6 | 0.0135 | 0.0174 | 0.0029 | 0.0005 | 0.0025 | 0.9463 |
| 46 166 | 8 | 0.0045 | 0.0089 | 0.0103 | 0.0012 | 0.0164 | 0.0085 |
| 47 167 | 3 | 0.0329 | 0.0360 | 0.3430 | 0.0038 | 0.3112 | 0.0380 |
| 48 169 | 2 | 0.0188 | 0.7761 | 0.0077 | 0.0014 | 0.0119 | 0.0443 |
| 49 170 | 3 | 0.0028 | 0.0016 | 0.9812 | 0.0002 | 0.0060 | 0.0021 |

**Membership Matrix Section**

| Row | Cluster | Prob in 7 | Prob in 8 |
|---|---|---|---|
| 1 5 | 2 | 0.0489 | 0.0122 |
| 2 8 | 7 | 0.7749 | 0.0082 |
| 3 9 | 1 | 0.0235 | 0.0033 |
| 4 16 | 5 | 0.0227 | 0.1148 |
| 5 17 | 7 | 0.8306 | 0.0086 |
| 6 18 | 6 | 0.0756 | 0.0204 |
| 7 23 | 5 | 0.0120 | 0.0484 |
| 8 24 | 1 | 0.0207 | 0.0026 |
| 9 25 | 2 | 0.0631 | 0.0122 |
| 10 28 | 2 | 0.0856 | 0.0807 |
| 11 30 | 4 | 0.0073 | 0.0111 |
| 12 33 | 7 | 0.9115 | 0.0041 |
| 13 44 | 1 | 0.0848 | 0.0430 |
| 14 45 | 2 | 0.0802 | 0.0147 |
| 15 48 | 5 | 0.1243 | 0.1261 |
| 16 50 | 3 | 0.0112 | 0.0147 |
| 17 51 | 1 | 0.0495 | 0.0134 |
| 18 53 | 8 | 0.0267 | 0.6677 |
| 19 57 | 8 | 0.0126 | 0.8749 |
| 20 59 | 6 | 0.0924 | 0.1367 |
| 21 62 | 1 | 0.0661 | 0.0059 |
| 22 66 | 4 | 0.0149 | 0.0187 |
| 23 69 | 8 | 0.0596 | 0.4064 |
| 24 70 | 3 | 0.0080 | 0.0156 |
| 25 76 | 3 | 0.0049 | 0.0116 |
| 26 78 | 2 | 0.1317 | 0.1328 |
| 27 79 | 7 | 0.7862 | 0.0088 |
| 28 81 | 7 | 0.6495 | 0.0119 |
| 29 88 | 8 | 0.0656 | 0.4004 |
| 30 94 | 5 | 0.0067 | 0.0115 |
| 31 96 | 7 | 0.4595 | 0.0132 |
| 32 100 | 1 | 0.0559 | 0.0193 |
| 33 106 | 2 | 0.2328 | 0.0815 |
| 34 108 | 5 | 0.0168 | 0.0382 |
| 35 109 | 8 | 0.0053 | 0.9403 |
| 36 111 | 6 | 0.0765 | 0.0559 |

**Fuzzy Clustering Report**

| | |
|---|---|
| Page/Date/Time | 24 4/14/2005 11:47:57 PM |
| Database | |
| Variables | StdFactor1MultSqrtEV1, StdFactor2MultSqrtEV2, StdFactor3MultSqrtEV3 |
| Distance Type | Euclidean |
| Scale Type | None |

**Membership Matrix Section**

| Row | Cluster | Prob in 7 | Prob in 8 |
|---|---|---|---|
| 37 112 | 7 | 0.6800 | 0.0210 |
| 38 116 | 1 | 0.2450 | 0.0180 |
| 39 119 | 5 | 0.0232 | 0.0266 |
| 40 123 | 6 | 0.0278 | 0.0092 |
| 41 137 | 6 | 0.0201 | 0.0048 |
| 42 145 | 7 | 0.4519 | 0.0176 |
| 43 157 | 4 | 0.0274 | 0.0400 |
| 44 160 | 5 | 0.0212 | 0.0312 |
| 45 162 | 6 | 0.0132 | 0.0037 |
| 46 166 | 8 | 0.0056 | 0.9445 |
| 47 167 | 3 | 0.0377 | 0.1974 |
| 48 169 | 2 | 0.1290 | 0.0109 |
| 49 170 | 3 | 0.0022 | 0.0038 |

**Summary Section**

| Number Clusters | Average Distance | Average Silhouette | F(U) | Fc(U) | D(U) | Dc(U) |
|---|---|---|---|---|---|---|
| 2 | 23.252100 | 0.324091 | 0.7139 | 0.4279 | 0.1061 | 0.2121 |
| 3 | 18.237564 | 0.403940 | 0.6863 | 0.5295 | 0.0953 | 0.1429 |
| 4 | 15.876248 | 0.254145 | 0.5287 | 0.3716 | 0.2118 | 0.2824 |
| 5 | 12.881879 | 0.288850 | 0.5692 | 0.4615 | 0.1899 | 0.2374 |
| 6 | 11.427568 | 0.277112 | 0.5481 | 0.4577 | 0.1864 | 0.2237 |
| 7 | 10.367288 | 0.274463 | 0.5499 | 0.4748 | 0.1896 | 0.2213 |
| 8 | 9.112325 | 0.339486 | 0.6069 | 0.5507 | 0.1601 | 0.1829 |

# Appendix A 5-3

**Principal Components Report**

Page/Date/Time 1 2/28/2004 12:43:11 PM
Database

**Robust and Missing-Value Estimation Iteration Section**

| No. | Count | Trace of Covar Matrix | Percent Change |
|---|---|---|---|
| 0 | 172 | 5.229149E+10 | 0.00 |
| 1 | 172 | 5.229149E+10 | 0.00 |
| 2 | 172 | 1.589979E+10 | -69.59 |
| 3 | 172 | 1.589979E+10 | 0.00 |
| 4 | 172 | 1.108209E+10 | -30.30 |
| 5 | 172 | 1.108209E+10 | 0.00 |
| 6 | 172 | 9.823919E+09 | -11.35 |

**Descriptive Statistics Section**

| Variables | Count | Mean | Standard Deviation | Communality |
|---|---|---|---|---|
| Political | 172 | 0.6742293 | 0.4700305 | 0.980320 |
| EXTREV | 172 | 80027.79 | 67749.71 | 0.847287 |
| SEREXP | 172 | 8607.168 | 8012.782 | 0.614665 |
| INVEST | 172 | 87874.55 | 71900.56 | 0.826074 |
| INDEX | 172 | 73.51629 | 17.11176 | 0.988270 |

**Correlation Section**

| Variables | Variables Political | EXTREV | SEREXP | INVEST | INDEX |
|---|---|---|---|---|---|
| Political | 1.000000 | 0.228758 | 0.054510 | 0.135318 | 0.043531 |
| EXTREV | 0.228758 | 1.000000 | 0.513748 | 0.795561 | 0.204738 |
| SEREXP | 0.054510 | 0.513748 | 1.000000 | 0.511992 | 0.257119 |
| INVEST | 0.135318 | 0.795561 | 0.511992 | 1.000000 | 0.249870 |
| INDEX | 0.043531 | 0.204738 | 0.257119 | 0.249870 | 1.000000 |

Phi=0.374828 Log(Det|R|)=-1.502372 Bartlett Test=253.15 DF=10 Prob=0.000000

**Bar Chart of Absolute Correlation Section**

<table>
<tr><th>Variables</th><th>Variables Political</th><th>EXTREV</th><th>SEREXP</th><th>INVEST</th><th>INDEX</th></tr>
<tr><td>Political</td><td></td><td>|||||</td><td>||</td><td>|||</td><td>|</td></tr>
<tr><td>EXTREV</td><td>|||||</td><td></td><td>|||||||||||</td><td>||||||||||||||||</td><td>|||||</td></tr>
<tr><td>SEREXP</td><td>||</td><td>|||||||||||</td><td></td><td>|||||||||||</td><td>||||||</td></tr>
<tr><td>INVEST</td><td>|||</td><td>||||||||||||||||</td><td>|||||||||||</td><td></td><td>|||||</td></tr>
<tr><td>INDEX</td><td>|</td><td>|||||</td><td>||||||</td><td>|||||</td><td></td></tr>
</table>

Phi=0.374828 Log(Det|R|)=-1.502372 Bartlett Test=253.15 DF=10 Prob=0.000000

**Principal Components Report**

Page/Date/Time 2 2/28/2004 12:43:11 PM
Database

**Eigenvalues**

| No. | Eigenvalue | Individual Percent | Cumulative Percent | Scree Plot |
|---|---|---|---|---|
| 1 | 2.393550 | 47.87 | 47.87 | \|\|\|\|\|\|\|\|\|\| |
| 2 | 0.995008 | 19.90 | 67.77 | \|\|\|\| |
| 3 | 0.868059 | 17.36 | 85.13 | \|\|\|\| |
| 4 | 0.546280 | 10.93 | 96.06 | \|\|\| |
| 5 | 0.197104 | 3.94 | 100.00 | \| |

**Eigenvectors**

| Variables | Factors Factor1 | Factor2 | Factor3 |
|---|---|---|---|
| Political | 0.177523 | -0.886384 | 0.376630 |
| EXTREV | 0.574634 | -0.114707 | -0.224719 |
| SEREXP | 0.481030 | 0.222390 | -0.115656 |
| INVEST | 0.572471 | 0.011789 | -0.218686 |
| INDEX | 0.281370 | 0.389318 | 0.863974 |

**Bar Chart of Absolute Eigenvectors**

| Variables | Factors Factor1 | Factor2 | Factor3 |
|---|---|---|---|
| Political | \|\|\|\| | \|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\| | \|\|\|\|\|\|\|\| |
| EXTREV | \|\|\|\|\|\|\|\|\|\|\|\| | \|\|\| | \|\|\|\|\| |
| SEREXP | \|\|\|\|\|\|\|\|\|\| | \|\|\|\|\| | \|\|\| |
| INVEST | \|\|\|\|\|\|\|\|\|\|\|\| | \| | \|\|\|\|\| |
| INDEX | \|\|\|\|\|\| | \|\|\|\|\|\|\|\| | \|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\|\| |

**Factor Loadings**

| Variables | Factors Factor1 | Factor2 | Factor3 |
|---|---|---|---|
| Political | 0.274647 | -0.884169 | 0.350905 |
| EXTREV | 0.889021 | -0.114420 | -0.209370 |
| SEREXP | 0.744206 | 0.221835 | -0.107756 |
| INVEST | 0.885676 | 0.011759 | -0.203749 |
| INDEX | 0.435310 | 0.388345 | 0.804962 |

**Principal Components Report**

Page/Date/Time 3 2/28/2004 12:43:11 PM
Database

**Bar Chart of Absolute Factor Loadings**

```
                    Factors
Variables           Factor1              Factor2              Factor3
Political           ||||||               ||||||||||||||||||   ||||||||
EXTREV              ||||||||||||||||||   |||                  |||||
SEREXP              |||||||||||||||      |||||                |||
INVEST              ||||||||||||||||||   |                    |||||
INDEX               |||||||||            ||||||||             |||||||||||||||||
```

**Communalities**

| | Factors | | | |
|---|---|---|---|---|
| **Variables** | **Factor1** | **Factor2** | **Factor3** | **Communality** |
| Political | 0.075431 | 0.781755 | 0.123134 | 0.980320 |
| EXTREV | 0.790359 | 0.013092 | 0.043836 | 0.847287 |
| SEREXP | 0.553843 | 0.049211 | 0.011611 | 0.614665 |
| INVEST | 0.784422 | 0.000138 | 0.041514 | 0.826074 |
| INDEX | 0.189495 | 0.150812 | 0.647964 | 0.988270 |

**Bar Chart of Communalities**

```
                    Factors
Variables           Factor1              Factor2              Factor3              Communality
Political           ||                   ||||||||||||||||     |||                  ||||||||||||||||||||
EXTREV              ||||||||||||||||     |                    |                    |||||||||||||||||
SEREXP              ||||||||||||         |                    |                    |||||||||||||
INVEST              ||||||||||||||||     |                    |                    |||||||||||||||||
INDEX               ||||                 ||||                 |||||||||||||        ||||||||||||||||||||
```

**Factor Structure Summary**

| | Factors | |
|---|---|---|
| **Factor1** | **Factor2** | **Factor3** |
| EXTREV | Political | INDEX |
| INVEST | | |
| SEREXP | | |
| INDEX | | |

**Residual Section**

| Row | T2 | T2 Prob | Weight | Q0 | Q1 | Q2 | Q3 |
|---|---|---|---|---|---|---|---|
| 1 | 6.17 | 0.3089 | 0.90 | 4.63 | 3.82 | 2.51 | 2.10 |
| 2 | 11.96* | 0.0441 | 0.59 | 6.08 | 4.17 | 3.38 | 3.11* |
| 3 | 2.71 | 0.7534 | 1.32 | 2.52 | 1.39 | 1.39 | 0.52 |
| 4 | 1.16 | 0.9509 | 1.68 | 1.34 | 0.75 | 0.24 | 0.12 |
| 5 | 3.89 | 0.5800 | 1.14 | 4.00 | 1.50 | 1.49 | 0.73 |
| 6 | 2.65 | 0.7630 | 1.29 | 3.40 | 1.54 | 0.55 | 0.21 |
| 7 | 2.29 | 0.8145 | 1.39 | 1.83 | 1.83 | 0.87 | 0.37 |
| 8 | 1.25 | 0.9423 | 1.66 | 1.51 | 0.90 | 0.43 | 0.01 |
| 9 | 2.65 | 0.7628 | 1.31 | 3.97 | 1.64 | 0.11 | 0.00 |
| 10 | 2.50 | 0.7847 | 1.34 | 2.26 | 1.28 | 0.54 | 0.53 |
| 11 | 10.21 | 0.0820 | 0.67 | 13.54 | 5.01 | 3.78 | 1.43 |
| 12 | .67 | 0.9851 | 1.86 | 0.56 | 0.56 | 0.28 | 0.06 |
| 13 | 4.60 | 0.4832 | 1.01 | 5.00 | 3.13 | 1.30 | 0.42 |
| 14 | 8.36 | 0.1540 | 0.75 | 3.84 | 3.64 | 2.56 | 1.60 |
| 15 | 2.08 | 0.8442 | 1.49 | 2.39 | 0.44 | 0.27 | 0.27 |
| 16 | 2.66 | 0.7606 | 1.30 | 2.55 | 2.55 | 0.11 | 0.11 |
| 17 | 2.15 | 0.8346 | 1.43 | 2.63 | 1.43 | 1.12 | 0.01 |
| 18 | 5.19 | 0.4110 | 0.99 | 3.80 | 3.66 | 2.03 | 1.55 |
| 19 | 3.90 | 0.5788 | 1.10 | 2.96 | 2.49 | 1.11 | 1.08 |
| 20 | 6.24 | 0.3025 | 0.89 | 4.36 | 2.95 | 2.71 | 1.94 |
| 21 | 3.33 | 0.6621 | 1.17 | 5.75 | 1.23 | 0.52 | 0.13 |
| 22 | 2.87 | 0.7304 | 1.31 | 2.86 | 0.91 | 0.80 | 0.33 |
| 23 | 8.77 | 0.1344 | 0.71 | 6.55 | 6.44 | 2.65 | 2.62* |
| 24 | 2.38 | 0.8016 | 1.36 | 3.30 | 1.43 | 0.23 | 0.15 |
| 25 | 9.72 | 0.0970 | 0.67 | 7.40 | 3.69 | 3.56 | 2.64* |
| 26 | 4.19 | 0.5384 | 1.07 | 3.42 | 2.49 | 1.51 | 1.16 |
| 27 | 507.18* | 0.0000 | 0.02 | 1022.17 | 107.31* | 106.68* | 0.40 |
| 28 | 5.74 | 0.3516 | 0.94 | 9.96 | 0.91 | 0.88 | 0.71 |
| 29 | 10.62 | 0.0710 | 0.66 | 8.04 | 2.35 | 1.99 | 1.59 |
| 30 | 90.25* | 0.0000 | 0.10 | 133.11 | 21.78* | 21.78* | 19.74* |
| 31 | 3.01 | 0.7091 | 1.23 | 3.12 | 1.85 | 0.83 | 0.59 |
| 32 | 3.61 | 0.6204 | 1.15 | 2.70 | 2.70 | 1.13 | 1.02 |
| 33 | 2.05 | 0.8486 | 1.45 | 1.58 | 1.51 | 1.42 | 0.37 |
| 34 | .75 | 0.9807 | 1.83 | 0.68 | 0.68 | 0.43 | 0.00 |
| 35 | 6.19 | 0.3071 | 0.84 | 9.01 | 3.33 | 3.18 | 0.00 |
| 36 | 24.09* | 0.0005 | 0.33 | 27.83 | 7.99* | 7.98* | 6.24* |
| 37 | 3.53 | 0.6317 | 1.20 | 3.54 | 1.71 | 1.34 | 1.23 |
| 38 | 4.30 | 0.5231 | 1.10 | 2.20 | 1.51 | 1.45 | 0.67 |
| 39 | 4.83 | 0.4539 | 1.04 | 6.34 | 0.89 | 0.88 | 0.80 |
| 40 | 2.33 | 0.8088 | 1.38 | 3.98 | 1.13 | 0.03 | 0.00 |
| 41 | 4.86 | 0.4504 | 1.03 | 3.21 | 2.18 | 1.74 | 1.42 |
| 42 | 1.28 | 0.9396 | 1.64 | 1.68 | 0.82 | 0.07 | 0.05 |
| 43 | 8.83 | 0.1316 | 0.71 | 9.05 | 6.61 | 1.40 | 1.29 |
| 44 | 5.00 | 0.4333 | 0.98 | 4.60 | 4.60 | 2.52 | 0.02 |
| 45 | 6.77 | 0.2568 | 0.83 | 6.21 | 3.42 | 3.40 | 0.52 |
| 46 | 2.96 | 0.7169 | 1.26 | 2.37 | 2.30 | 2.12 | 0.45 |
| 47 | 5.62 | 0.3631 | 0.94 | 3.54 | 3.30 | 1.37 | 0.83 |
| 48 | 20.59* | 0.0018 | 0.36 | 18.65 | 18.50* | 10.69* | 0.26 |
| 49 | 1.48 | 0.9180 | 1.65 | 2.28 | 0.49 | 0.10 | 0.06 |
| 50 | 4.74 | 0.4658 | 0.98 | 7.82 | 2.01 | 1.72 | 0.04 |
| 51 | 5.01 | 0.4324 | 0.96 | 6.70 | 3.23 | 1.10 | 0.21 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 52 | 4.19 | 0.5378 | 1.12 | 2.76 | 1.35 | 1.18 | 0.94 |
| 53 | 5.72 | 0.3527 | 0.92 | 4.14 | 3.79 | 2.48 | 1.87 |

## Principal Components Report

Page/Date/Time 5 2/28/2004 12:43:11 PM
Database

**Residual Section**

| Row | T2 | T2 Prob | Weight | Q0 | Q1 | Q2 | Q3 |
|---|---|---|---|---|---|---|---|
| 54 | 2.67 | 0.7598 | 1.32 | 2.50 | 1.98 | 1.68 | 0.31 |
| 55 | 1.98 | 0.8572 | 1.46 | 1.74 | 1.19 | 0.91 | 0.60 |
| 56 | 7.08 | 0.2332 | 0.78 | 8.29 | 5.02 | 2.38 | 0.32 |
| 57 | 7.57 | 0.1994 | 0.80 | 8.77 | 4.67 | 2.25 | 0.33 |
| 58 | 2.43 | 0.7945 | 1.37 | 2.22 | 1.86 | 1.59 | 0.26 |
| 59 | 13.86* | 0.0222 | 0.55 | 22.30 | 2.57 | 2.35 | 0.73 |
| 60 | 4.77 | 0.4614 | 1.04 | 3.97 | 1.42 | 1.40 | 0.53 |
| 61 | 102.63* | 0.0000 | 0.09 | 80.05 | 27.75* | 25.82* | 17.87* |
| 62 | 2.34 | 0.8074 | 1.37 | 2.39 | 1.39 | 0.61 | 0.60 |
| 63 | 38.74* | 0.0000 | 0.23 | 64.75 | 4.85 | 4.84* | 2.58* |
| 64 | 2.67 | 0.7596 | 1.30 | 2.54 | 1.96 | 0.46 | 0.13 |
| 65 | 7.03 | 0.2372 | 0.84 | 4.39 | 1.42 | 1.41 | 1.30 |
| 66 | 331.83* | 0.0000 | 0.03 | 187.05 | 76.68* | 74.98* | 70.01* |
| 67 | 4.00 | 0.5646 | 1.07 | 6.91 | 1.59 | 1.13 | 0.02 |
| 68 | 1.37 | 0.9301 | 1.66 | 1.55 | 0.96 | 0.23 | 0.09 |
| 69 | 23.90* | 0.0005 | 0.34 | 16.94 | 11.74* | 4.16 | 3.75* |
| 70 | 4.93 | 0.4425 | 0.96 | 5.52 | 3.20 | 2.96 | 0.43 |
| 71 | 4.85 | 0.4517 | 1.00 | 3.36 | 3.15 | 2.50 | 0.36 |
| 72 | 5.47 | 0.3802 | 0.92 | 5.83 | 4.57 | 2.04 | 0.01 |
| 73 | 2.01 | 0.8537 | 1.46 | 2.25 | 1.33 | 1.02 | 0.04 |
| 74 | 46.80* | 0.0000 | 0.17 | 42.41 | 41.13* | 26.69* | 0.82 |
| 75 | 3.27 | 0.6699 | 1.24 | 2.87 | 1.76 | 1.25 | 1.20 |
| 76 | 3.49 | 0.6380 | 1.15 | 4.24 | 2.17 | 1.36 | 0.08 |
| 77 | 11.29 | 0.0560 | 0.62 | 17.61 | 5.03 | 2.12 | 0.34 |
| 78 | 22.14* | 0.0010 | 0.34 | 34.08 | 10.79* | 8.67* | 0.07 |
| 79 | 2.30 | 0.8128 | 1.39 | 1.56 | 1.55 | 1.50 | 0.76 |
| 80 | 22.56* | 0.0009 | 0.36 | 9.13 | 4.73 | 4.61* | 4.61* |
| 81 | 22.84* | 0.0008 | 0.36 | 6.18 | 5.98 | 5.60* | 4.57* |
| 82 | 2.93 | 0.7215 | 1.25 | 3.80 | 1.77 | 0.07 | 0.07 |
| 83 | .79 | 0.9786 | 1.82 | 0.79 | 0.60 | 0.45 | 0.02 |
| 84 | 9.04 | 0.1226 | 0.70 | 13.63 | 2.76 | 2.52 | 1.96 |
| 85 | 4.50 | 0.4970 | 1.04 | 3.39 | 3.27 | 1.74 | 0.71 |
| 86 | 9.46 | 0.1062 | 0.67 | 6.14 | 4.93 | 4.87* | 4.23* |
| 87 | 3.98 | 0.5679 | 1.09 | 5.21 | 2.34 | 0.50 | 0.09 |
| 88 | 55.18* | 0.0000 | 0.17 | 34.35 | 13.70* | 12.04* | 8.31* |
| 89 | 19.17* | 0.0031 | 0.40 | 10.16 | 9.97* | 5.63* | 3.94* |
| 90 | 2.52 | 0.7818 | 1.31 | 3.65 | 1.44 | 0.43 | 0.09 |
| 91 | 13.51* | 0.0252 | 0.55 | 18.51 | 5.85 | 4.76* | 2.39 |
| 92 | 40.43* | 0.0000 | 0.22 | 55.00 | 11.56* | 7.34* | 2.94* |
| 93 | 2.75 | 0.7483 | 1.28 | 3.50 | 1.90 | 0.44 | 0.10 |
| 94 | 3.75 | 0.5995 | 1.12 | 4.10 | 3.28 | 0.48 | 0.05 |
| 95 | 2.58 | 0.7734 | 1.35 | 2.00 | 1.38 | 0.89 | 0.39 |
| 96 | 1.59 | 0.9056 | 1.56 | 2.21 | 1.01 | 0.24 | 0.06 |
| 97 | 14.52* | 0.0174 | 0.49 | 8.30 | 7.44* | 7.36* | 6.89* |
| 98 | 3.57 | 0.6258 | 1.19 | 1.59 | 1.58 | 1.41 | 0.52 |
| 99 | 4.04 | 0.5583 | 1.12 | 2.71 | 2.50 | 1.54 | 1.51 |
| 100 | 4.73 | 0.4667 | 0.99 | 4.66 | 3.76 | 1.91 | 0.43 |
| 101 | 9.04 | 0.1225 | 0.69 | 6.38 | 6.33 | 4.65* | 2.35 |
| 102 | 5.86 | 0.3387 | 0.89 | 5.32 | 5.20 | 1.68 | 0.49 |
| 103 | 2.76 | 0.7463 | 1.33 | 1.01 | 0.87 | 0.71 | 0.46 |
| 104 | 3.13 | 0.6917 | 1.21 | 5.38 | 1.24 | 0.35 | 0.14 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 105 | 15.97* | 0.0102 | 0.46 | 17.54 | 8.89* | 1.99 | 1.42 |
| 106 | 20.70* | 0.0017 | 0.36 | 17.47 | 17.37* | 16.80* | 1.06 |

## Principal Components Report



**Residual Section**

| Row | T2 | T2 Prob | Weight | Q0 | Q1 | Q2 | Q3 |
|---|---|---|---|---|---|---|---|
| 107 | 3.28 | 0.6694 | 1.21 | 1.92 | 1.85 | 1.27 | 1.10 |
| 108 | 4.89 | 0.4465 | 0.98 | 4.52 | 4.50 | 0.84 | 0.08 |
| 109 | 5.81 | 0.3444 | 0.93 | 5.01 | 3.44 | 1.17 | 0.51 |
| 110 | 3.43 | 0.6475 | 1.18 | 2.80 | 2.71 | 1.35 | 0.69 |
| 111 | 14.07* | 0.0205 | 0.52 | 13.85 | 6.39 | 5.31* | 4.73* |
| 112 | 4.15 | 0.5432 | 1.09 | 4.43 | 2.98 | 2.84 | 0.06 |
| 113 | 2.62 | 0.7668 | 1.35 | 0.90 | 0.88 | 0.51 | 0.47 |
| 114 | 3.97 | 0.5682 | 1.11 | 3.59 | 3.01 | 2.93 | 0.11 |
| 115 | 5.86 | 0.3390 | 0.90 | 3.53 | 3.53 | 3.05 | 2.73* |
| 116 | 2.82 | 0.7380 | 1.29 | 1.76 | 1.58 | 1.19 | 1.19 |
| 117 | 1.56 | 0.9096 | 1.58 | 0.80 | 0.76 | 0.23 | 0.23 |
| 118 | 2.75 | 0.7485 | 1.29 | 2.48 | 2.13 | 0.20 | 0.12 |
| 119 | 4.92 | 0.4433 | 0.98 | 5.47 | 3.43 | 1.16 | 0.53 |
| 120 | 5.55 | 0.3707 | 0.95 | 6.70 | 4.07 | 0.41 | 0.28 |
| 121 | 2.85 | 0.7336 | 1.27 | 2.56 | 2.23 | 0.84 | 0.09 |
| 122 | 3.75 | 0.6005 | 1.11 | 6.06 | 1.57 | 1.04 | 0.15 |
| 123 | 5.14 | 0.4167 | 0.98 | 3.58 | 2.52 | 2.43 | 2.40* |
| 124 | 11.02 | 0.0617 | 0.59 | 9.47 | 9.45* | 9.28* | 0.08 |
| 125 | 4.14 | 0.5451 | 1.05 | 6.66 | 1.81 | 1.43 | 0.09 |
| 126 | 1.77 | 0.8840 | 1.51 | 1.74 | 1.39 | 1.19 | 0.01 |
| 127 | 3.40 | 0.6512 | 1.17 | 4.37 | 2.15 | 0.37 | 0.30 |
| 128 | 25.08* | 0.0003 | 0.32 | 28.19 | 12.60* | 4.90* | 4.81* |
| 129 | 12.64* | 0.0346 | 0.55 | 6.57 | 6.04 | 6.03* | 2.91* |
| 130 | 43.30* | 0.0000 | 0.20 | 33.47 | 13.78* | 12.79* | 8.51* |
| 131 | 55.22* | 0.0000 | 0.16 | 19.04 | 17.86* | 17.25* | 13.24* |
| 132 | 1.95 | 0.8612 | 1.46 | 2.99 | 1.04 | 0.09 | 0.09 |
| 133 | 2.81 | 0.7397 | 1.27 | 3.69 | 1.84 | 0.29 | 0.12 |
| 134 | 183.37* | 0.0000 | 0.05 | 165.04 | 30.58* | 29.88* | 26.51* |
| 135 | .86 | 0.9737 | 1.79 | 0.63 | 0.59 | 0.33 | 0.15 |
| 136 | 13.27* | 0.0275 | 0.52 | 9.86 | 8.61* | 7.41* | 4.43* |
| 137 | 1.18 | 0.9490 | 1.71 | 1.33 | 0.67 | 0.20 | 0.13 |
| 138 | 5.01 | 0.4327 | 0.97 | 3.79 | 3.14 | 2.64 | 1.33 |
| 139 | 2.02 | 0.8519 | 1.45 | 2.90 | 1.01 | 0.37 | 0.21 |
| 140 | 1.15 | 0.9519 | 1.70 | 0.76 | 0.73 | 0.47 | 0.08 |
| 141 | 15.58* | 0.0118 | 0.49 | 15.43 | 6.49 | 5.13* | 3.37* |
| 142 | 27.74* | 0.0001 | 0.30 | 45.46 | 7.46* | 7.45* | 4.09* |
| 143 | 7.34 | 0.2145 | 0.80 | 6.02 | 5.64 | 3.41 | 1.49 |
| 144 | 16.83* | 0.0074 | 0.42 | 15.37 | 13.89* | 6.63* | 0.75 |
| 145 | 3.46 | 0.6426 | 1.17 | 2.98 | 2.75 | 2.73 | 0.27 |
| 146 | 10.56 | 0.0725 | 0.66 | 14.48 | 2.63 | 2.31 | 0.90 |
| 147 | 5.27 | 0.4016 | 0.96 | 3.04 | 2.94 | 2.86 | 2.60* |
| 148 | 2.51 | 0.7830 | 1.33 | 2.64 | 2.15 | 0.44 | 0.11 |
| 149 | 1.94 | 0.8625 | 1.49 | 1.02 | 1.01 | 0.76 | 0.31 |
| 150 | 2.55 | 0.7771 | 1.35 | 3.24 | 1.38 | 0.90 | 0.10 |
| 151 | 1.35 | 0.9320 | 1.62 | 1.48 | 0.88 | 0.49 | 0.21 |
| 152 | 3.16 | 0.6866 | 1.20 | 4.99 | 1.44 | 0.73 | 0.18 |
| 153 | 2.97 | 0.7156 | 1.23 | 4.33 | 1.61 | 0.66 | 0.03 |
| 154 | 5.00 | 0.4337 | 0.99 | 3.48 | 3.48 | 1.26 | 0.70 |
| 155 | 4.84 | 0.4527 | 0.99 | 4.21 | 2.88 | 2.31 | 0.50 |
| 156 | 5.50 | 0.3764 | 0.93 | 3.82 | 3.82 | 0.88 | 0.56 |
| 157 | 134.97* | 0.0000 | 0.07 | 265.73 | 22.30* | 18.94* | 11.38* |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 158 | 2.31 | 0.8113 | 1.43 | 2.60 | 1.68 | 0.72 | 0.16 |
| 159 | 2.57 | 0.7740 | 1.32 | 3.72 | 1.66 | 0.03 | 0.01 |

**Principal Components Report**

Page/Date/Time 7 2/28/2004 12:43:11 PM
Database

**Residual Section**

| Row | T2 | T2 Prob | Weight | Q0 | Q1 | Q2 | Q3 |
|---|---|---|---|---|---|---|---|
| 160 | 3.05 | 0.7027 | 1.23 | 4.17 | 2.12 | 0.15 | 0.07 |
| 161 | 10.96 | 0.0631 | 0.62 | 11.76 | 8.22* | 5.93* | 0.40 |
| 162 | 3.74 | 0.6018 | 1.19 | 2.15 | 1.04 | 0.64 | 0.60 |
| 163 | 5.68 | 0.3571 | 0.95 | 5.90 | 1.15 | 1.15 | 0.62 |
| 164 | 2.19 | 0.8287 | 1.44 | 1.56 | 1.44 | 0.69 | 0.69 |
| 165 | 30.31* | 0.0000 | 0.27 | 24.39 | 14.86* | 8.85* | 8.57* |
| 166 | 5.95 | 0.3296 | 0.92 | 7.15 | 3.39 | 0.93 | 0.49 |
| 167 | 5.71 | 0.3542 | 0.93 | 3.45 | 3.24 | 1.42 | 1.03 |
| 168 | 5.16 | 0.4150 | 0.98 | 5.16 | 2.12 | 2.10 | 0.74 |
| 169 | 2.80 | 0.7412 | 1.30 | 2.52 | 1.58 | 1.58 | 0.15 |
| 170 | 3.76 | 0.5993 | 1.11 | 5.36 | 1.96 | 1.43 | 0.04 |
| 171 | 3.02 | 0.7083 | 1.26 | 2.02 | 1.73 | 1.71 | 0.70 |
| 172 | 3.07 | 0.7008 | 1.27 | 3.38 | 1.33 | 1.10 | 0.94 |

**Factor Score**

| | Factors | | |
|---|---|---|---|
| **Row** | **Factor1** | **Factor2** | **Factor3** |
| 1 | 0.5812 | -1.1463 | -0.6866 |
| 2 | 0.8918 | -0.8900 | -0.5665 |
| 3 | 0.6878 | -0.0077 | 0.9998 |
| 4 | -0.4988 | -0.7141 | 0.3664 |
| 5 | 1.0230 | 0.0994 | 0.9334 |
| 6 | -0.8820 | 0.9945 | -0.6271 |
| 7 | -0.0199 | -0.9820 | -0.7548 |
| 8 | -0.5068 | -0.6832 | 0.6975 |
| 9 | -0.9853 | -1.2416 | -0.3466 |
| 10 | -0.6399 | -0.8641 | -0.1203 |
| 11 | 1.8883 | -1.1105 | -1.6443 |
| 12 | 0.0488 | -0.5330 | 0.4977 |
| 13 | -0.8839 | -1.3572 | -1.0036 |
| 14 | 0.2903 | -1.0444 | -1.0494 |
| 15 | 0.9023 | -0.4147 | -0.0321 |
| 16 | -0.0155 | 1.5641 | 0.0240 |
| 17 | -0.7080 | -0.5655 | 1.1284 |
| 18 | 0.2441 | -1.2773 | -0.7492 |
| 19 | -0.4404 | 1.1792 | -0.1787 |
| 20 | 0.7672 | -0.4881 | 0.9463 |
| 21 | -1.3729 | 0.8489 | -0.6714 |
| 22 | 0.9029 | -0.3193 | 0.7388 |
| 23 | -0.2167 | 1.9516 | 0.2014 |
| 24 | -0.8821 | -1.1021 | -0.2870 |
| 25 | 1.2457 | -0.3587 | 1.0302 |
| 26 | -0.6243 | 0.9926 | -0.6367 |
| 27 | 19.5504 | 0.7953 | -11.0649 |
| 28 | 1.9449 | 0.1864 | 0.4367 |
| 29 | 1.5409 | -0.6027 | -0.6841 |
| 30 | 6.8201 | -0.0255 | -1.5344 |
| 31 | -0.7283 | 1.0147 | -0.5304 |
| 32 | -0.0144 | 1.2563 | -0.3638 |
| 33 | -0.1699 | -0.2872 | 1.1000 |
| 34 | 0.0502 | -0.5027 | 0.6975 |

| | | | |
|---|---|---|---|
| 35 | -1.5403 | 0.3866 | -1.9148 |
| 36 | 2.8794 | 0.1175 | -1.4155 |
| 37 | 0.8759 | -0.6040 | 0.3621 |
| 38 | 0.5370 | -0.2362 | 0.9452 |
| 39 | 1.5092 | -0.1081 | 0.2947 |
| 40 | -1.0916 | -1.0506 | 0.1821 |
| 41 | 0.6565 | -0.6628 | -0.6138 |
| 42 | -0.6017 | -0.8688 | 0.1247 |
| 43 | 1.0082 | 2.2898 | 0.3485 |
| 44 | -0.0440 | -1.4463 | -1.6972 |

**Factor Score**

| Row | Factors Factor1 | Factor2 | Factor3 |
|---|---|---|---|
| 45 | 1.0795 | 0.1397 | 1.8200 |
| 46 | -0.1681 | -0.4262 | 1.3866 |
| 47 | -0.3190 | -1.3907 | -0.7882 |
| 48 | -0.2527 | 2.8017 | 3.4657 |
| 49 | 0.8661 | -0.6281 | -0.2079 |
| 50 | -1.5586 | 0.5400 | -1.3891 |
| 51 | -1.2051 | -1.4608 | -1.0138 |
| 52 | 0.7651 | -0.4204 | 0.5192 |
| 53 | 0.3822 | 1.1491 | -0.8400 |
| 54 | -0.4651 | -0.5490 | 1.2555 |
| 55 | -0.4793 | -0.5309 | 0.5975 |
| 56 | -1.1688 | -1.6304 | -1.5405 |
| 57 | 1.3101 | 1.5592 | -1.4868 |
| 58 | -0.3915 | -0.5192 | 1.2344 |
| 59 | 2.8704 | -0.4720 | -1.3694 |
| 60 | 1.0327 | -0.1400 | 1.0032 |
| 61 | 4.6747 | -1.3929 | -3.0266 |
| 62 | -0.6450 | -0.8860 | -0.1247 |
| 63 | 5.0024 | 0.1069 | -1.6136 |
| 64 | -0.4908 | 1.2297 | -0.6199 |
| 65 | 1.1156 | -0.0845 | 0.3588 |
| 66 | 6.7907 | -1.3044 | -2.3926 |
| 67 | -1.4911 | 0.6826 | -1.1306 |
| 68 | 0.4986 | -0.8558 | -0.3941 |
| 69 | 1.4731 | 2.7616 | 0.6869 |
| 70 | -0.9833 | 0.4993 | -1.7042 |
| 71 | -0.2941 | 0.8048 | -1.5730 |
| 72 | -0.7258 | -1.5946 | -1.5258 |
| 73 | -0.6203 | -0.5606 | 1.0600 |
| 74 | 0.7320 | 3.8093 | 5.4591 |
| 75 | 0.6797 | -0.7166 | 0.2328 |
| 76 | -0.9290 | 0.9011 | -1.2180 |
| 77 | 2.2920 | 1.7090 | -1.4347 |
| 78 | 3.1197 | 1.4594 | 3.1465 |
| 79 | 0.0460 | -0.2256 | 0.9264 |
| 80 | 1.3558 | -0.3508 | 0.0258 |
| 81 | 0.2876 | -0.6218 | 1.0881 |
| 82 | -0.9201 | 1.3065 | 0.0003 |
| 83 | 0.2850 | -0.3860 | 0.7012 |
| 84 | 2.1311 | 0.4933 | 0.8016 |
| 85 | -0.2207 | 1.2409 | -1.0916 |
| 86 | 0.7126 | 0.2331 | 0.8634 |
| 87 | -1.0956 | -1.3579 | -0.6883 |
| 88 | 2.9376 | 1.2908 | -2.0744 |

**Factor Score**

| Row | Factors Factor1 | Factor2 | Factor3 |
|---|---|---|---|
| 89 | 0.2821 | 2.0880 | 1.3986 |
| 90 | -0.9614 | 1.0080 | -0.6259 |
| 91 | 2.2997 | -1.0495 | -1.6501 |
| 92 | 4.2601 | 2.0588 | -2.2526 |
| 93 | -0.8180 | -1.2119 | -0.6207 |
| 94 | -0.5879 | 1.6774 | 0.6984 |
| 95 | -0.5116 | -0.6978 | 0.7612 |
| 96 | -0.7081 | -0.8776 | 0.4543 |
| 97 | 0.5989 | 0.2793 | 0.7414 |
| 98 | -0.0714 | -0.4115 | 1.0116 |
| 99 | 0.2942 | -0.9867 | -0.1762 |
| 100 | -0.6146 | -1.3633 | -1.3072 |
| 101 | 0.1536 | 1.2997 | -1.6249 |
| 102 | -0.2192 | 1.8812 | 1.1720 |
| 103 | 0.2391 | -0.3981 | 0.5403 |
| 104 | -1.3163 | 0.9422 | -0.4927 |
| 105 | 1.9002 | 2.6333 | 0.8148 |
| 106 | 0.2071 | 0.7528 | 4.2587 |
| 107 | -0.1648 | -0.7679 | -0.4339 |
| 108 | -0.0685 | 1.9193 | 0.9364 |
| 109 | 0.8123 | 1.5092 | -0.8698 |
| 110 | 0.2021 | 1.1690 | -0.8727 |
| 111 | 1.7651 | -1.0426 | -0.8215 |
| 112 | -0.7795 | -0.3659 | 1.7919 |
| 113 | -0.0796 | -0.6136 | 0.2012 |
| 114 | -0.4909 | -0.2898 | 1.8033 |
| 115 | -0.0294 | -0.6949 | -0.6047 |
| 116 | -0.2791 | -0.6245 | 0.0085 |
| 117 | -0.1246 | -0.7326 | 0.0098 |
| 118 | -0.3836 | 1.3901 | -0.3014 |
| 119 | -0.9218 | 1.5113 | 0.8517 |
| 120 | 1.0494 | 1.9167 | -0.3848 |
| 121 | -0.3750 | 1.1817 | -0.9272 |
| 122 | -1.3710 | 0.7289 | -1.0087 |
| 123 | 0.6655 | -0.3013 | -0.1605 |
| 124 | -0.0722 | 0.4242 | 3.2553 |
| 125 | -1.4230 | 0.6206 | -1.2416 |
| 126 | -0.3821 | -0.4548 | 1.1638 |
| 127 | -0.9630 | 1.3374 | 0.2801 |
| 128 | 2.5518 | 2.7809 | -0.3373 |
| 129 | 0.4736 | -0.0596 | 1.8972 |
| 130 | 2.8681 | -0.9995 | -2.2188 |
| 131 | 0.7011 | 0.7829 | -2.1494 |
| 132 | -0.9019 | -0.9751 | 0.0959 |

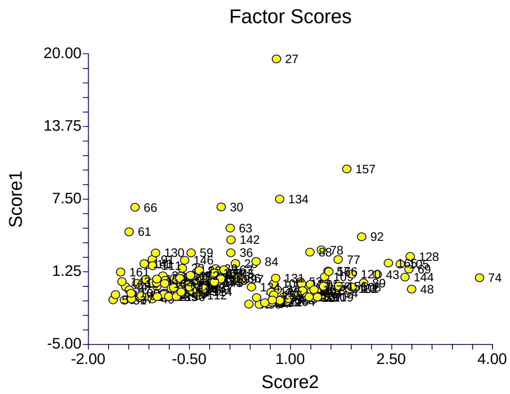
**Principal Components Report**

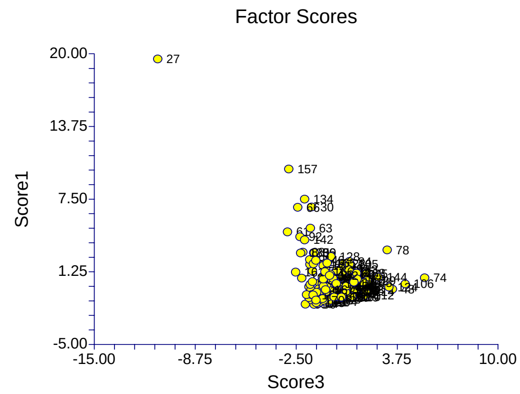
Page/Date/Time 10 2/28/2004 12:43:11 PM
Database

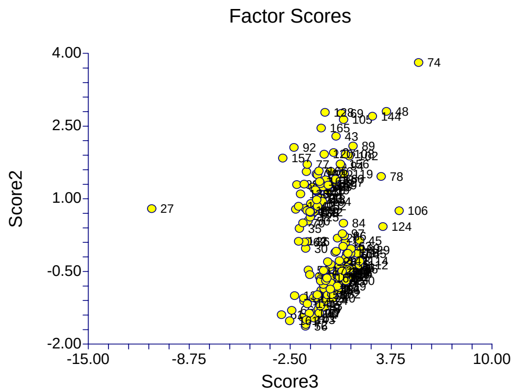
**Factor Score**

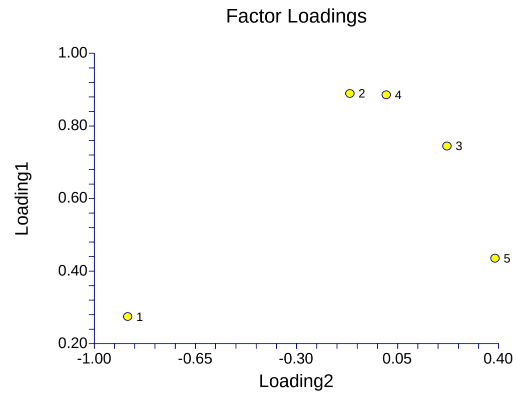
| | Factors | | |
|---|---|---|---|
| **Row** | **Factor1** | **Factor2** | **Factor3** |
| 133 | -0.8789 | 1.2489 | -0.4495 |
| 134 | 7.4949 | 0.8428 | -1.9689 |
| 135 | 0.1124 | -0.5152 | 0.4501 |
| 136 | -0.7231 | 1.0985 | -1.8534 |
| 137 | 0.5256 | -0.6873 | -0.2856 |
| 138 | -0.5203 | 0.7150 | -1.2249 |
| 139 | -0.8871 | -0.8050 | 0.4273 |
| 140 | 0.1039 | -0.5102 | 0.6698 |
| 141 | 1.9327 | -1.1687 | -1.4245 |
| 142 | 3.9842 | 0.1206 | -1.9678 |
| 143 | 0.3936 | -1.5001 | -1.4856 |
| 144 | 0.7840 | 2.7026 | 2.6020 |
| 145 | 0.3134 | -0.1307 | 1.6845 |
| 146 | 2.2251 | -0.5671 | -1.2730 |
| 147 | -0.2015 | -0.2793 | 0.5533 |
| 148 | -0.4492 | 1.3123 | -0.6126 |
| 149 | -0.0853 | -0.4938 | 0.7214 |
| 150 | -0.8815 | -0.6921 | 0.9624 |
| 151 | -0.5036 | -0.6212 | 0.5660 |
| 152 | -1.2170 | 0.8435 | -0.7970 |
| 153 | -1.0643 | 0.9779 | -0.8536 |
| 154 | 0.0054 | 1.4932 | -0.8020 |
| 155 | -0.7465 | 0.7552 | -1.4449 |
| 156 | 0.0077 | 1.7164 | 0.6134 |
| 157 | 10.0848 | 1.8379 | -2.9501 |
| 158 | 0.6211 | -0.9814 | -0.8059 |
| 159 | -0.9277 | 1.2803 | -0.1360 |
| 160 | -0.9261 | 1.4041 | 0.3123 |
| 161 | 1.2158 | -1.5182 | -2.5238 |
| 162 | 0.6786 | -0.6386 | -0.2163 |
| 163 | 1.4088 | 0.0159 | 0.7830 |
| 164 | 0.2252 | -0.8654 | -0.0126 |
| 165 | 1.9960 | 2.4564 | -0.5719 |
| 166 | 1.2544 | 1.5709 | -0.7134 |
| 167 | -0.2966 | 1.3532 | -0.6721 |
| 168 | 1.1281 | -0.1277 | 1.2530 |
| 169 | 0.6248 | -0.0306 | 1.2831 |
| 170 | -1.1904 | 0.7320 | -1.2667 |
| 171 | 0.3529 | -0.1273 | 1.0792 |
| 172 | 0.9255 | -0.4814 | -0.4253 |

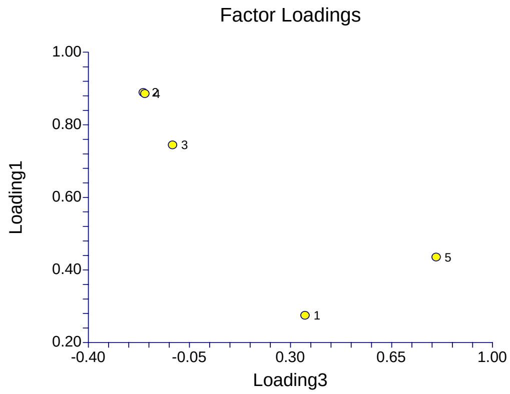
## Plots Section

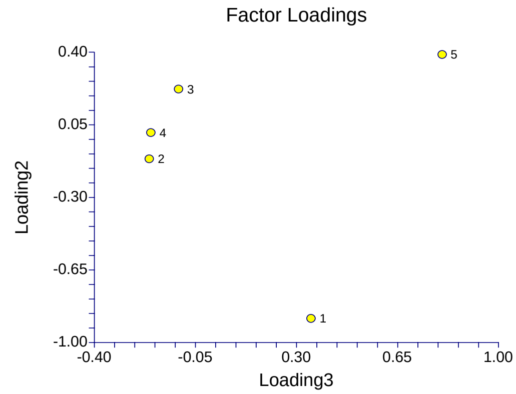


# Appendix A 5-4

**Fuzzy Clustering Report**

| | |
|---|---|
| Page/Date/Time | 1 4/14/2005 11:54:24 PM |
| Database | |
| Variables | StdFactor1MultSqrtEv1, StdFactor2MultSqrtEv2, StdFactor3MultSqrtEv3 |
| Distance Type | Euclidean |
| Scale Type | None |

**Cluster Medoids Section**

| Variable | Cluster1 | Cluster2 | Cluster3 | Cluster4 | Cluster5 |
|---|---|---|---|---|---|
| StdFactor1MultSqrtEv1 | -0.3812687 | 0.7727175 | -0.2978425 | 0.128696 | -0.2617805 |
| StdFactor2MultSqrtEv2 | -0.401873 | -0.4378219 | -1.00365 | 0.5584149 | 1.005297 |
| StdFactor3MultSqrtEv3 | -1.003986 | -0.5013725 | 0.7373211 | -0.4478955 | 2.025263 |
| Row | 6 7 | 67 98 | 5 6 | 53 80 | 120 165 |

**Membership Summary Section for Clusters = 5**

<table>
<tr><th>Row</th><th>Cluster</th><th>Cluster Membership</th><th>Sum of Squared Memberships</th><th>Bar of Squared Memberships</th><th>Silhouette Amount</th><th>Silhouette Bar</th></tr>
<tr><td>6 7</td><td>1</td><td>0.8310</td><td>0.7003</td><td>||||||||||||||||||||||</td><td>0.5227</td><td>|||||||||||||||||</td></tr>
<tr><td>33 47</td><td>1</td><td>0.8180</td><td>0.6800</td><td>|||||||||||||||||||||</td><td>0.5468</td><td>|||||||||||||||||</td></tr>
<tr><td>129 18</td><td>1</td><td>0.7848</td><td>0.6321</td><td>||||||||||||||||||||</td><td>0.5203</td><td>|||||||||||||||||</td></tr>
<tr><td>64 93</td><td>1</td><td>0.7759</td><td>0.6190</td><td>||||||||||||||||||||</td><td>0.4905</td><td>||||||||||||||||</td></tr>
<tr><td>11 14</td><td>1</td><td>0.7577</td><td>0.5943</td><td>|||||||||||||||||||</td><td>0.4891</td><td>||||||||||||||||</td></tr>
<tr><td>155 100</td><td>1</td><td>0.7558</td><td>0.5887</td><td>|||||||||||||||||||</td><td>0.5470</td><td>|||||||||||||||||</td></tr>
<tr><td>10 13</td><td>1</td><td>0.7509</td><td>0.5827</td><td>||||||||||||||||||</td><td>0.5220</td><td>|||||||||||||||||</td></tr>
<tr><td>74 107</td><td>1</td><td>0.7452</td><td>0.5798</td><td>||||||||||||||||||</td><td>0.3870</td><td>|||||||||||||</td></tr>
<tr><td>78 115</td><td>1</td><td>0.7271</td><td>0.5547</td><td>||||||||||||||||||</td><td>0.4087</td><td>|||||||||||||</td></tr>
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## Fuzzy Clustering Report

Page/Date/Time 2 4/14/2005 11:54:24 PM
Database
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Distance Type Euclidean
Scale Type None

**Membership Summary Section for Clusters = 5**

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## Fuzzy Clustering Report

Page/Date/Time 3 4/14/2005 11:54:24 PM
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Distance Type Euclidean
Scale Type None

**Membership Summary Section for Clusters = 5**

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<tr><td>44 65</td><td>4</td><td>0.7352</td><td>0.5636</td><td>||||||||||||||||||</td><td>0.2378</td><td>||||||||</td></tr>
<tr><td>27 39</td><td>4</td><td>0.7340</td><td>0.5589</td><td>||||||||||||||||||</td><td>0.3493</td><td>|||||||||||</td></tr>
<tr><td>118 163</td><td>4</td><td>0.6739</td><td>0.4872</td><td>||||||||||||||||</td><td>0.2352</td><td>||||||||</td></tr>
<tr><td>12 15</td><td>4</td><td>0.6669</td><td>0.4843</td><td>||||||||||||||||</td><td>0.2165</td><td>|||||||</td></tr>
<tr><td>132 25</td><td>4</td><td>0.6149</td><td>0.4369</td><td>||||||||||||||</td><td>0.0971</td><td>||||</td></tr>
</table>

**Fuzzy Clustering Report**

Page/Date/Time 4 4/14/2005 11:54:24 PM
Database
Variables StdFactor1MultSqrtEv1, StdFactor2MultSqrtEv2, StdFactor3MultSqrtEv3
Distance Type Euclidean
Scale Type None

**Membership Summary Section for Clusters = 5**

<table>
<tr><th>Row</th><th>Cluster</th><th>Cluster Membership</th><th>Sum of Squared Memberships</th><th>Bar of Squared Memberships</th><th>Silhouette Amount</th><th>Silhouette Bar</th></tr>
<tr><td>16 22</td><td>4</td><td>0.6046</td><td>0.4415</td><td>|IIIIIIIIIIIII</td><td>-0.0057</td><td>|</td></tr>
<tr><td>40 60</td><td>4</td><td>0.5944</td><td>0.4251</td><td>|IIIIIIIIIIIII</td><td>0.0134</td><td>|</td></tr>
<tr><td>25 37</td><td>4</td><td>0.5935</td><td>0.4206</td><td>|IIIIIIIIIIIII</td><td>0.0755</td><td>|II</td></tr>
<tr><td>124 5</td><td>4</td><td>0.5901</td><td>0.4111</td><td>|IIIIIIIIIIII</td><td>0.0407</td><td>|I</td></tr>
<tr><td>133 28</td><td>4</td><td>0.5833</td><td>0.3898</td><td>|IIIIIIIIIIII</td><td>0.3398</td><td>|IIIIIIIIII</td></tr>
<tr><td>19 29</td><td>4</td><td>0.5662</td><td>0.3821</td><td>|IIIIIIIIIII</td><td>0.2441</td><td>|IIIIIII</td></tr>
<tr><td>123 172</td><td>4</td><td>0.5651</td><td>0.3917</td><td>|IIIIIIIIIIII</td><td>0.1036</td><td>|III</td></tr>
<tr><td>35 52</td><td>4</td><td>0.5639</td><td>0.4119</td><td>|IIIIIIIIIIII</td><td>-0.0501</td><td>|</td></tr>
<tr><td>163 123</td><td>4</td><td>0.5533</td><td>0.3770</td><td>|IIIIIIIIIII</td><td>0.1094</td><td>|III</td></tr>
<tr><td>34 49</td><td>4</td><td>0.5504</td><td>0.3852</td><td>|IIIIIIIIIIII</td><td>0.0655</td><td>|II</td></tr>
<tr><td>121 168</td><td>4</td><td>0.5445</td><td>0.3812</td><td>|IIIIIIIIIII</td><td>-0.0169</td><td>|</td></tr>
<tr><td>58 86</td><td>4</td><td>0.4717</td><td>0.3330</td><td>|IIIIIIIIII</td><td>-0.1193</td><td>|</td></tr>
<tr><td>159 111</td><td>4</td><td>0.4568</td><td>0.3126</td><td>|IIIIIIIII</td><td>0.1642</td><td>|IIIII</td></tr>
<tr><td>51 75</td><td>4</td><td>0.4568</td><td>0.3319</td><td>|IIIIIIIIII</td><td>-0.0392</td><td>|</td></tr>
<tr><td>168 162</td><td>4</td><td>0.4488</td><td>0.3354</td><td>|IIIIIIIIII</td><td>-0.0808</td><td>|</td></tr>
<tr><td>104 146</td><td>4</td><td>0.4453</td><td>0.2851</td><td>|IIIIIIIII</td><td>0.2738</td><td>|IIIIIIII</td></tr>
<tr><td>56 84</td><td>4</td><td>0.4414</td><td>0.2965</td><td>|IIIIIIIII</td><td>0.2652</td><td>|IIIIIIII</td></tr>
<tr><td>3 3</td><td>4</td><td>0.4411</td><td>0.3587</td><td>|IIIIIIIIIII</td><td>-0.2098</td><td>|</td></tr>
<tr><td>66 97</td><td>4</td><td>0.4375</td><td>0.3126</td><td>|IIIIIIIII</td><td>-0.1490</td><td>|</td></tr>
<tr><td>14 20</td><td>4</td><td>0.4297</td><td>0.3712</td><td>|IIIIIIIIIII</td><td>-0.2044</td><td>|</td></tr>
<tr><td>137 45</td><td>4</td><td>0.3997</td><td>0.2864</td><td>|IIIIIIIII</td><td>-0.1539</td><td>|</td></tr>
<tr><td>143 59</td><td>4</td><td>0.3888</td><td>0.2585</td><td>|IIIIIIII</td><td>0.2962</td><td>|IIIIIIIII</td></tr>
<tr><td>100 141</td><td>4</td><td>0.3832</td><td>0.2748</td><td>|IIIIIIII</td><td>0.1074</td><td>|III</td></tr>
<tr><td>62 91</td><td>4</td><td>0.3812</td><td>0.2592</td><td>|IIIIIIII</td><td>0.1722</td><td>|IIIII</td></tr>
<tr><td>8 11</td><td>4</td><td>0.3687</td><td>0.2682</td><td>|IIIIIIII</td><td>0.0828</td><td>|II</td></tr>
<tr><td>90 130</td><td>4</td><td>0.3321</td><td>0.2344</td><td>|IIIIIII</td><td>0.1699</td><td>|IIIII</td></tr>
<tr><td>41 61</td><td>4</td><td>0.2749</td><td>0.2195</td><td>|IIIIIII</td><td>0.1392</td><td>|IIII</td></tr>
<tr><td>120 165</td><td>5</td><td>0.7539</td><td>0.5854</td><td>|IIIIIIIIIIIIIIIIII</td><td>-0.1738</td><td>|</td></tr>
<tr><td>88 128</td><td>5</td><td>0.7060</td><td>0.5220</td><td>|IIIIIIIIIIIIIIII</td><td>-0.0383</td><td>|</td></tr>
<tr><td>52 77</td><td>5</td><td>0.6883</td><td>0.5008</td><td>|IIIIIIIIIIIIIII</td><td>-0.1807</td><td>|</td></tr>
<tr><td>73 105</td><td>5</td><td>0.6796</td><td>0.4899</td><td>|IIIIIIIIIIIIIII</td><td>-0.1400</td><td>|</td></tr>
<tr><td>81 120</td><td>5</td><td>0.6793</td><td>0.4958</td><td>|IIIIIIIIIIIIIII</td><td>-0.4626</td><td>|</td></tr>
<tr><td>31 43</td><td>5</td><td>0.6656</td><td>0.4775</td><td>|IIIIIIIIIIIIII</td><td>-0.3855</td><td>|</td></tr>
<tr><td>146 69</td><td>5</td><td>0.6641</td><td>0.4728</td><td>|IIIIIIIIIIIIII</td><td>-0.2150</td><td>|</td></tr>
<tr><td>169 166</td><td>5</td><td>0.6607</td><td>0.4723</td><td>|IIIIIIIIIIIIII</td><td>-0.4572</td><td>|</td></tr>
<tr><td>142 57</td><td>5</td><td>0.5902</td><td>0.3998</td><td>|IIIIIIIIIIII</td><td>-0.4392</td><td>|</td></tr>
<tr><td>152 88</td><td>5</td><td>0.5633</td><td>0.3702</td><td>|IIIIIIIIIII</td><td>-0.1638</td><td>|</td></tr>
<tr><td>63 92</td><td>5</td><td>0.5305</td><td>0.3403</td><td>|IIIIIIIIII</td><td>0.0535</td><td>|II</td></tr>
<tr><td>158 109</td><td>5</td><td>0.5024</td><td>0.3472</td><td>|IIIIIIIIII</td><td>-0.5798</td><td>|</td></tr>
<tr><td>60 89</td><td>5</td><td>0.4268</td><td>0.2790</td><td>|IIIIIIII</td><td>-0.4592</td><td>|</td></tr>
<tr><td>103 144</td><td>5</td><td>0.4201</td><td>0.2656</td><td>|IIIIIIII</td><td>-0.2344</td><td>|</td></tr>
<tr><td>101 142</td><td>5</td><td>0.3809</td><td>0.2591</td><td>|IIIIIIII</td><td>-0.2760</td><td>|</td></tr>
</table>

## Fuzzy Clustering Report

| | |
|---|---|
| Page/Date/Time | 5 4/14/2005 11:54:24 PM |
| Database | |
| Variables | StdFactor1MultSqrtEv1, StdFactor2MultSqrtEv2, StdFactor3MultSqrtEv3 |
| Distance Type | Euclidean |
| Scale Type | None |

**Membership Summary Section for Clusters = 5**

| Row | Cluster | Cluster Membership | Sum of Squared Memberships | Bar of Squared Memberships | Silhouette Amount | Silhouette Bar |
|---|---|---|---|---|---|---|
| 42 63 | 5 | 0.3786 | 0.2548 | \|\|\|\|\|\|\|\|\| | -0.1739 | \| |
| 149 78 | 5 | 0.3716 | 0.2470 | \|\|\|\|\|\|\|\| | -0.1864 | \| |
| 94 134 | 5 | 0.3661 | 0.2405 | \|\|\|\|\|\|\|\| | 0.0592 | \|\|\| |
| 157 108 | 5 | 0.3487 | 0.2728 | \|\|\|\|\|\|\|\|\| | -0.5811 | \| |
| 134 30 | 5 | 0.3483 | 0.2367 | \|\|\|\|\|\|\|\| | -0.0407 | \| |
| 24 36 | 5 | 0.3381 | 0.2629 | \|\|\|\|\|\|\|\|\| | -0.4581 | \| |
| 166 157 | 5 | 0.3279 | 0.2234 | \|\|\|\|\|\|\|\| | 0.1138 | \|\|\|\| |
| 138 48 | 5 | 0.3173 | 0.2227 | \|\|\|\|\|\|\|\| | -0.2781 | \| |
| 50 74 | 5 | 0.3081 | 0.2171 | \|\|\|\|\|\|\|\| | -0.1103 | \| |
| 145 66 | 5 | 0.2899 | 0.2198 | \|\|\|\|\|\|\|\| | -0.1284 | \| |
| 18 27 | 5 | 0.2459 | 0.2034 | \|\|\|\|\|\|\| | 0.0591 | \|\|\| |

**Membership Matrix Section**

| Row | Cluster | Prob in 1 | Prob in 2 | Prob in 3 | Prob in 4 | Prob in 5 |
|---|---|---|---|---|---|---|
| 1 1 | 1 | 0.6705 | 0.0995 | 0.0282 | 0.1761 | 0.0256 |
| 2 2 | 1 | 0.4403 | 0.1231 | 0.0347 | 0.3651 | 0.0368 |
| 3 3 | 4 | 0.0735 | 0.3929 | 0.0431 | 0.4411 | 0.0494 |
| 4 4 | 2 | 0.2589 | 0.6091 | 0.0311 | 0.0842 | 0.0167 |
| 5 6 | 3 | 0.0160 | 0.0178 | 0.9311 | 0.0164 | 0.0187 |
| 6 7 | 1 | 0.8310 | 0.0669 | 0.0203 | 0.0686 | 0.0131 |
| 7 10 | 1 | 0.6408 | 0.2264 | 0.0365 | 0.0782 | 0.0181 |
| 8 11 | 4 | 0.3107 | 0.1230 | 0.0759 | 0.3687 | 0.1216 |
| 9 12 | 2 | 0.0968 | 0.7763 | 0.0165 | 0.0990 | 0.0113 |
| 10 13 | 1 | 0.7509 | 0.1016 | 0.0462 | 0.0759 | 0.0255 |
| 11 14 | 1 | 0.7577 | 0.0754 | 0.0299 | 0.1142 | 0.0228 |
| 12 15 | 4 | 0.1350 | 0.1401 | 0.0274 | 0.6669 | 0.0306 |
| 13 19 | 3 | 0.0267 | 0.0380 | 0.8414 | 0.0385 | 0.0554 |
| 14 20 | 4 | 0.0917 | 0.4201 | 0.0273 | 0.4297 | 0.0312 |
| 15 21 | 3 | 0.0487 | 0.0503 | 0.8219 | 0.0400 | 0.0391 |
| 16 22 | 4 | 0.0755 | 0.2619 | 0.0259 | 0.6046 | 0.0320 |
| 17 26 | 3 | 0.0158 | 0.0177 | 0.9275 | 0.0178 | 0.0211 |
| 18 27 | 5 | 0.1893 | 0.1758 | 0.1782 | 0.2109 | 0.2459 |
| 19 29 | 4 | 0.2061 | 0.1069 | 0.0466 | 0.5662 | 0.0742 |
| 20 31 | 3 | 0.0153 | 0.0180 | 0.9296 | 0.0171 | 0.0201 |
| 21 32 | 3 | 0.0381 | 0.0500 | 0.7229 | 0.0647 | 0.1243 |
| 22 34 | 2 | 0.0540 | 0.8557 | 0.0119 | 0.0699 | 0.0085 |
| 23 35 | 3 | 0.1872 | 0.1134 | 0.4994 | 0.1077 | 0.0923 |
| 24 36 | 5 | 0.1362 | 0.0997 | 0.0919 | 0.3341 | 0.3381 |
| 25 37 | 4 | 0.1327 | 0.2225 | 0.0240 | 0.5935 | 0.0273 |
| 26 38 | 2 | 0.0710 | 0.5501 | 0.0290 | 0.3208 | 0.0291 |
| 27 39 | 4 | 0.0698 | 0.1021 | 0.0323 | 0.7340 | 0.0618 |
| 28 40 | 1 | 0.4936 | 0.3167 | 0.0596 | 0.1002 | 0.0300 |

**Fuzzy Clustering Report**

Page/Date/Time 6 4/14/2005 11:54:24 PM
Database
Variables StdFactor1MultSqrtEv1, StdFactor2MultSqrtEv2, StdFactor3MultSqrtEv3
Distance Type Euclidean
Scale Type None

**Membership Matrix Section**

| Row | Cluster | Prob in 1 | Prob in 2 | Prob in 3 | Prob in 4 | Prob in 5 |
|---|---|---|---|---|---|---|
| 29 41 | 1 | 0.4647 | 0.1271 | 0.0384 | 0.3354 | 0.0343 |
| 30 42 | 1 | 0.5014 | 0.3548 | 0.0365 | 0.0882 | 0.0192 |
| 31 43 | 5 | 0.0417 | 0.0578 | 0.1475 | 0.0874 | 0.6656 |
| 32 46 | 2 | 0.0587 | 0.8133 | 0.0243 | 0.0853 | 0.0184 |
| 33 47 | 1 | 0.8180 | 0.0763 | 0.0247 | 0.0646 | 0.0163 |
| 34 49 | 4 | 0.2440 | 0.1444 | 0.0296 | 0.5504 | 0.0315 |
| 35 52 | 4 | 0.0967 | 0.2887 | 0.0243 | 0.5639 | 0.0264 |
| 36 54 | 2 | 0.0695 | 0.8224 | 0.0246 | 0.0673 | 0.0162 |
| 37 55 | 2 | 0.1056 | 0.7977 | 0.0234 | 0.0609 | 0.0124 |
| 38 56 | 1 | 0.6138 | 0.1360 | 0.0846 | 0.1164 | 0.0491 |
| 39 58 | 2 | 0.0597 | 0.8428 | 0.0212 | 0.0621 | 0.0142 |
| 40 60 | 4 | 0.0704 | 0.2513 | 0.0345 | 0.5944 | 0.0493 |
| 41 61 | 4 | 0.2055 | 0.1406 | 0.1186 | 0.2749 | 0.2605 |
| 42 63 | 5 | 0.1404 | 0.1166 | 0.1055 | 0.2590 | 0.3786 |
| 43 64 | 3 | 0.0145 | 0.0169 | 0.9204 | 0.0186 | 0.0295 |
| 44 65 | 4 | 0.0653 | 0.1272 | 0.0296 | 0.7352 | 0.0427 |
| 45 67 | 3 | 0.0854 | 0.0705 | 0.7303 | 0.0593 | 0.0544 |
| 46 68 | 1 | 0.5848 | 0.1346 | 0.0271 | 0.2305 | 0.0230 |
| 47 71 | 3 | 0.0862 | 0.0624 | 0.6694 | 0.0840 | 0.0980 |
| 48 72 | 1 | 0.6805 | 0.1114 | 0.0631 | 0.1054 | 0.0396 |
| 49 73 | 2 | 0.0851 | 0.8065 | 0.0276 | 0.0647 | 0.0162 |
| 50 74 | 5 | 0.1302 | 0.1816 | 0.1910 | 0.1892 | 0.3081 |
| 51 75 | 4 | 0.2181 | 0.2727 | 0.0263 | 0.4568 | 0.0261 |
| 52 77 | 5 | 0.0534 | 0.0506 | 0.0964 | 0.1113 | 0.6883 |
| 53 80 | 4 | 0.0901 | 0.0967 | 0.0269 | 0.7441 | 0.0423 |
| 54 82 | 3 | 0.0341 | 0.0494 | 0.8137 | 0.0426 | 0.0601 |
| 55 83 | 2 | 0.0677 | 0.7374 | 0.0186 | 0.1614 | 0.0150 |
| 56 84 | 4 | 0.0842 | 0.1316 | 0.0751 | 0.4414 | 0.2677 |
| 57 85 | 3 | 0.0328 | 0.0321 | 0.8155 | 0.0423 | 0.0773 |
| 58 86 | 4 | 0.0787 | 0.3066 | 0.0657 | 0.4717 | 0.0773 |
| 59 87 | 1 | 0.7041 | 0.1332 | 0.0527 | 0.0821 | 0.0279 |
| 60 89 | 5 | 0.0712 | 0.1227 | 0.2387 | 0.1406 | 0.4268 |
| 61 90 | 3 | 0.0174 | 0.0193 | 0.9259 | 0.0174 | 0.0199 |
| 62 91 | 4 | 0.2629 | 0.1239 | 0.0804 | 0.3812 | 0.1516 |
| 63 92 | 5 | 0.0965 | 0.0874 | 0.1184 | 0.1672 | 0.5305 |
| 64 93 | 1 | 0.7759 | 0.1062 | 0.0353 | 0.0639 | 0.0187 |
| 65 95 | 2 | 0.1122 | 0.7904 | 0.0222 | 0.0621 | 0.0130 |
| 66 97 | 4 | 0.0846 | 0.3182 | 0.0787 | 0.4375 | 0.0810 |
| 67 98 | 2 | 0.0376 | 0.8858 | 0.0126 | 0.0550 | 0.0089 |
| 68 99 | 1 | 0.6300 | 0.1656 | 0.0234 | 0.1624 | 0.0185 |
| 69 101 | 3 | 0.0740 | 0.0627 | 0.5495 | 0.0977 | 0.2161 |
| 70 102 | 3 | 0.0748 | 0.1332 | 0.3369 | 0.1348 | 0.3203 |
| 71 103 | 2 | 0.0864 | 0.7089 | 0.0205 | 0.1687 | 0.0155 |
| 72 104 | 3 | 0.0410 | 0.0466 | 0.8380 | 0.0367 | 0.0377 |

## Fuzzy Clustering Report

| | |
|---|---|
| Page/Date/Time | 7 4/14/2005 11:54:24 PM |
| Database | |
| Variables | StdFactor1MultSqrtEv1, StdFactor2MultSqrtEv2, StdFactor3MultSqrtEv3 |
| Distance Type | Euclidean |
| Scale Type | None |

**Membership Matrix Section**

| Row | Cluster | Prob in 1 | Prob in 2 | Prob in 3 | Prob in 4 | Prob in 5 |
|---|---|---|---|---|---|---|
| 73 105 | 5 | 0.0479 | 0.0644 | 0.1068 | 0.1013 | 0.6796 |
| 74 107 | 1 | 0.7452 | 0.1273 | 0.0268 | 0.0857 | 0.0150 |
| 75 110 | 3 | 0.0527 | 0.0552 | 0.6366 | 0.0855 | 0.1701 |
| 76 113 | 2 | 0.2713 | 0.5549 | 0.0277 | 0.1292 | 0.0169 |
| 77 114 | 2 | 0.1016 | 0.6571 | 0.0614 | 0.1352 | 0.0446 |
| 78 115 | 1 | 0.7271 | 0.1147 | 0.0323 | 0.1074 | 0.0186 |
| 79 117 | 1 | 0.4884 | 0.3431 | 0.0290 | 0.1221 | 0.0174 |
| 80 118 | 3 | 0.0247 | 0.0329 | 0.8370 | 0.0365 | 0.0690 |
| 81 120 | 5 | 0.0379 | 0.0465 | 0.1552 | 0.0811 | 0.6793 |
| 82 121 | 3 | 0.0212 | 0.0218 | 0.8882 | 0.0264 | 0.0423 |
| 83 122 | 3 | 0.0650 | 0.0568 | 0.7860 | 0.0478 | 0.0444 |
| 84 124 | 2 | 0.1321 | 0.3394 | 0.1387 | 0.2298 | 0.1599 |
| 85 125 | 3 | 0.0953 | 0.0739 | 0.7100 | 0.0639 | 0.0569 |
| 86 126 | 2 | 0.0525 | 0.8591 | 0.0195 | 0.0563 | 0.0126 |
| 87 127 | 3 | 0.0506 | 0.0801 | 0.7132 | 0.0655 | 0.0906 |
| 88 128 | 5 | 0.0482 | 0.0549 | 0.0960 | 0.0949 | 0.7060 |
| 89 129 | 2 | 0.0957 | 0.4893 | 0.0649 | 0.2755 | 0.0747 |
| 90 130 | 4 | 0.2335 | 0.1265 | 0.0984 | 0.3321 | 0.2094 |
| 91 131 | 3 | 0.1464 | 0.0945 | 0.3003 | 0.1843 | 0.2745 |
| 92 132 | 1 | 0.5329 | 0.3037 | 0.0486 | 0.0905 | 0.0243 |
| 93 133 | 3 | 0.0170 | 0.0209 | 0.9147 | 0.0197 | 0.0277 |
| 94 134 | 5 | 0.1467 | 0.1325 | 0.1296 | 0.2251 | 0.3661 |
| 95 135 | 2 | 0.1114 | 0.7286 | 0.0190 | 0.1277 | 0.0133 |
| 96 136 | 3 | 0.0765 | 0.0583 | 0.6958 | 0.0706 | 0.0988 |
| 97 138 | 3 | 0.0624 | 0.0490 | 0.7770 | 0.0565 | 0.0551 |
| 98 139 | 2 | 0.3210 | 0.5082 | 0.0507 | 0.0950 | 0.0251 |
| 99 140 | 2 | 0.0613 | 0.8307 | 0.0130 | 0.0854 | 0.0095 |
| 100 141 | 4 | 0.3071 | 0.1247 | 0.0702 | 0.3832 | 0.1148 |
| 101 142 | 5 | 0.1411 | 0.1067 | 0.1027 | 0.2686 | 0.3809 |
| 102 143 | 1 | 0.6554 | 0.1007 | 0.0495 | 0.1513 | 0.0430 |
| 103 144 | 5 | 0.0895 | 0.1421 | 0.1848 | 0.1635 | 0.4201 |
| 104 146 | 4 | 0.2049 | 0.1117 | 0.0742 | 0.4453 | 0.1639 |
| 105 147 | 2 | 0.0783 | 0.7967 | 0.0264 | 0.0843 | 0.0144 |
| 106 148 | 3 | 0.0165 | 0.0194 | 0.9039 | 0.0220 | 0.0382 |
| 107 149 | 2 | 0.0477 | 0.8814 | 0.0112 | 0.0523 | 0.0074 |
| 108 150 | 2 | 0.1581 | 0.6816 | 0.0461 | 0.0891 | 0.0251 |
| 109 151 | 2 | 0.1331 | 0.7640 | 0.0244 | 0.0653 | 0.0132 |
| 110 152 | 3 | 0.0377 | 0.0372 | 0.8625 | 0.0315 | 0.0311 |
| 111 153 | 3 | 0.0232 | 0.0232 | 0.9084 | 0.0213 | 0.0239 |
| 112 154 | 3 | 0.0386 | 0.0431 | 0.6994 | 0.0598 | 0.1590 |
| 113 155 | 3 | 0.0670 | 0.0498 | 0.7709 | 0.0553 | 0.0570 |
| 114 156 | 3 | 0.0610 | 0.1029 | 0.3974 | 0.1178 | 0.3208 |
| 115 158 | 1 | 0.6414 | 0.0975 | 0.0318 | 0.2005 | 0.0288 |
| 116 159 | 3 | 0.0278 | 0.0383 | 0.8535 | 0.0337 | 0.0466 |

**Fuzzy Clustering Report**

Page/Date/Time 8 4/14/2005 11:54:24 PM
Database
Variables StdFactor1MultSqrtEv1, StdFactor2MultSqrtEv2, StdFactor3MultSqrtEv3
Distance Type Euclidean
Scale Type None

**Membership Matrix Section**

| Row | Cluster | Prob in 1 | Prob in 2 | Prob in 3 | Prob in 4 | Prob in 5 |
|---|---|---|---|---|---|---|
| 117 161 | 1 | 0.4059 | 0.1321 | 0.0976 | 0.2503 | 0.1141 |
| 118 163 | 4 | 0.0669 | 0.1469 | 0.0388 | 0.6739 | 0.0734 |
| 119 164 | 1 | 0.5158 | 0.2558 | 0.0256 | 0.1835 | 0.0193 |
| 120 165 | 5 | 0.0376 | 0.0425 | 0.0898 | 0.0762 | 0.7539 |
| 121 168 | 4 | 0.0788 | 0.2693 | 0.0423 | 0.5445 | 0.0651 |
| 122 171 | 2 | 0.0652 | 0.6404 | 0.0337 | 0.2302 | 0.0305 |
| 123 172 | 4 | 0.2318 | 0.1243 | 0.0377 | 0.5651 | 0.0410 |
| 124 5 | 4 | 0.0693 | 0.2266 | 0.0458 | 0.5901 | 0.0682 |
| 125 8 | 2 | 0.1166 | 0.7866 | 0.0222 | 0.0619 | 0.0127 |
| 126 9 | 1 | 0.6959 | 0.1578 | 0.0448 | 0.0780 | 0.0235 |
| 127 16 | 3 | 0.0470 | 0.0693 | 0.5731 | 0.0855 | 0.2251 |
| 128 17 | 2 | 0.0985 | 0.7720 | 0.0347 | 0.0748 | 0.0201 |
| 129 18 | 1 | 0.7848 | 0.0780 | 0.0227 | 0.0964 | 0.0181 |
| 130 23 | 3 | 0.0540 | 0.0785 | 0.4939 | 0.0905 | 0.2830 |
| 131 24 | 1 | 0.7019 | 0.1638 | 0.0404 | 0.0733 | 0.0206 |
| 132 25 | 4 | 0.0817 | 0.2204 | 0.0327 | 0.6149 | 0.0503 |
| 133 28 | 4 | 0.0823 | 0.1171 | 0.0562 | 0.5833 | 0.1611 |
| 134 30 | 5 | 0.1533 | 0.1345 | 0.1202 | 0.2438 | 0.3483 |
| 135 33 | 2 | 0.0439 | 0.8571 | 0.0193 | 0.0667 | 0.0130 |
| 136 44 | 1 | 0.6794 | 0.0982 | 0.0566 | 0.1240 | 0.0418 |
| 137 45 | 4 | 0.0955 | 0.3132 | 0.0729 | 0.3997 | 0.1187 |
| 138 48 | 5 | 0.1127 | 0.1789 | 0.2154 | 0.1756 | 0.3173 |
| 139 50 | 3 | 0.1280 | 0.0929 | 0.6297 | 0.0800 | 0.0693 |
| 140 51 | 1 | 0.6677 | 0.1344 | 0.0670 | 0.0949 | 0.0360 |
| 141 53 | 3 | 0.0629 | 0.0663 | 0.5258 | 0.1119 | 0.2331 |
| 142 57 | 5 | 0.0614 | 0.0566 | 0.1765 | 0.1153 | 0.5902 |
| 143 59 | 4 | 0.1772 | 0.1135 | 0.0839 | 0.3888 | 0.2366 |
| 144 62 | 1 | 0.6447 | 0.2236 | 0.0360 | 0.0776 | 0.0180 |
| 145 66 | 5 | 0.1826 | 0.1476 | 0.1247 | 0.2552 | 0.2899 |
| 146 69 | 5 | 0.0484 | 0.0649 | 0.1259 | 0.0966 | 0.6641 |
| 147 70 | 3 | 0.1386 | 0.0861 | 0.6062 | 0.0902 | 0.0789 |
| 148 76 | 3 | 0.0371 | 0.0317 | 0.8632 | 0.0323 | 0.0358 |
| 149 78 | 5 | 0.1079 | 0.1611 | 0.1217 | 0.2378 | 0.3716 |
| 150 79 | 2 | 0.0474 | 0.8207 | 0.0205 | 0.0969 | 0.0146 |
| 151 81 | 2 | 0.0770 | 0.7346 | 0.0202 | 0.1501 | 0.0181 |
| 152 88 | 5 | 0.0877 | 0.0725 | 0.1085 | 0.1680 | 0.5633 |
| 153 94 | 3 | 0.0662 | 0.1129 | 0.5107 | 0.1057 | 0.2045 |
| 154 96 | 2 | 0.3122 | 0.5361 | 0.0392 | 0.0913 | 0.0213 |
| 155 100 | 1 | 0.7558 | 0.0895 | 0.0460 | 0.0813 | 0.0273 |
| 156 106 | 2 | 0.1380 | 0.2743 | 0.1527 | 0.2293 | 0.2057 |
| 157 108 | 5 | 0.0675 | 0.1150 | 0.3428 | 0.1260 | 0.3487 |
| 158 109 | 5 | 0.0541 | 0.0583 | 0.2771 | 0.1080 | 0.5024 |
| 159 111 | 4 | 0.2799 | 0.1235 | 0.0535 | 0.4568 | 0.0863 |
| 160 112 | 2 | 0.1210 | 0.6256 | 0.0724 | 0.1332 | 0.0478 |

**Fuzzy Clustering Report**

| | |
|---|---|
| Page/Date/Time | 9 4/14/2005 11:54:24 PM |
| Database | |
| Variables | StdFactor1MultSqrtEv1, StdFactor2MultSqrtEv2, StdFactor3MultSqrtEv3 |
| Distance Type | Euclidean |
| Scale Type | None |

**Membership Matrix Section**

| Row | Cluster | Prob in 1 | Prob in 2 | Prob in 3 | Prob in 4 | Prob in 5 |
|---|---|---|---|---|---|---|
| 161 116 | 1 | 0.4295 | 0.3999 | 0.0365 | 0.1149 | 0.0192 |
| 162 119 | 3 | 0.0773 | 0.1381 | 0.5078 | 0.1116 | 0.1651 |
| 163 123 | 4 | 0.1863 | 0.1819 | 0.0414 | 0.5533 | 0.0372 |
| 164 137 | 1 | 0.4438 | 0.1721 | 0.0312 | 0.3265 | 0.0264 |
| 165 145 | 2 | 0.0843 | 0.5791 | 0.0519 | 0.2322 | 0.0525 |
| 166 157 | 5 | 0.1589 | 0.1473 | 0.1511 | 0.2149 | 0.3279 |
| 167 160 | 3 | 0.0513 | 0.0815 | 0.6987 | 0.0687 | 0.0997 |
| 168 162 | 4 | 0.3216 | 0.1697 | 0.0310 | 0.4488 | 0.0290 |
| 169 166 | 5 | 0.0439 | 0.0488 | 0.1464 | 0.1003 | 0.6607 |
| 170 167 | 3 | 0.0217 | 0.0251 | 0.8638 | 0.0305 | 0.0589 |
| 171 169 | 2 | 0.0765 | 0.4563 | 0.0469 | 0.3668 | 0.0534 |
| 172 170 | 3 | 0.0657 | 0.0522 | 0.7867 | 0.0487 | 0.0468 |

**Summary Section**

| Number Clusters | Average Distance | Average Silhouette | F(U) | Fc(U) | D(U) | Dc(U) |
|---|---|---|---|---|---|---|
| 5 | 46.728469 | 0.280083 | 0.4812 | 0.3515 | 0.2298 | 0.2872 |

# Appendix A 5-5

Cluster 1 Environmental variable

| Obs | Political_ | SEREXP | EXTREV | INVEST | indexx |
|---|---|---|---|---|---|
| 1 | 1 | 1057 | 151678 | 185402 | 64.1 |
| 2 | 1 | 4138 | 120210 | 246339 | 68.8 |
| 4 | 1 | 6298 | 38038 | 46557 | 69.2 |
| 7 | 1 | 11359 | 91960 | 73122 | 55.1 |
| 9 | 1 | 521 | 38633 | 27790 | 53.3 |
| 10 | 1 | 7766 | 20207 | 47093 | 59.5 |
| 11 | 1 | 11303 | 258319 | 255764 | 60.6 |
| 13 | 1 | 5791 | 50907 | 16350 | 42.8 |
| 14 | 1 | 14534 | 151628 | 50033 | 53.1 |
| 18 | 1 | 128 | 149877 | 137913 | 59.7 |
| 24 | 1 | 4185 | 35900 | 20017 | 54.8 |
| 29 | 1 | 20057 | 235080 | 124697 | 71.4 |
| 40 | 1 | 156 | 20828 | 13146 | 60.9 |
| 41 | 1 | 18828 | 138630 | 81388 | 63.4 |
| 42 | 1 | 4714 | 38805 | 47601 | 64.4 |
| 44 | 1 | 8074 | 110483 | 104873 | 39.9 |
| 47 | 1 | 584 | 128103 | 61875 | 53.1 |
| 49 | 1 | 12565 | 152372 | 134463 | 73.2 |
| 51 | 1 | 2770 | 20701 | 15300 | 39.7 |
| 56 | 1 | 3709 | 24415 | 28670 | 31.3 |
| 61 | 1 | 18835 | 631984 | 330572 | 66.3 |
| 62 | 1 | 8426 | 38746 | 21797 | 59.3 |
| 68 | 1 | 8524 | 134725 | 125331 | 66.9 |
| 72 | 1 | 3081 | 63925 | 67063 | 36.3 |
| 75 | 1 | 3823 | 151551 | 151402 | 79.8 |
| 87 | 1 | 632 | 18857 | 40617 | 46.5 |
| 91 | 1 | 11467 | 285486 | 296843 | 64.8 |
| 93 | 1 | 4137 | 37370 | 41184 | 50 |
| 96 | 1 | 774 | 44579 | 40364 | 69.3 |
| 99 | 1 | 704 | 121345 | 153455 | 69.5 |
| 100 | 1 | 8027 | 60511 | 46770 | 40.3 |
| 107 | 1 | 13307 | 43567 | 74809 | 58.5 |
| 111 | 1 | 3539 | 270536 | 249671 | 74 |
| 113 | 1 | 8675 | 40874 | 104380 | 70.5 |
| 115 | 1 | 18839 | 59060 | 47458 | 56.3 |
| 116 | 1 | 13039 | 34458 | 51732 | 64.6 |
| 117 | 1 | 8062 | 52961 | 94618 | 67 |
| 130 | 1 | 12254 | 236456 | 461035 | 61.2 |
| 132 | 1 | 3307 | 29710 | 16587 | 61 |
| 137 | 1 | 12840 | 123303 | 107309 | 68.3 |
| 139 | 1 | 4530 | 21279 | 8078 | 66.4 |
| 141 | 1 | 8142 | 300494 | 233788 | 65.2 |
| 143 | 1 | 1365 | 160591 | 168319 | 49 |
| 146 | 1 | 25373 | 263631 | 193963 | 68.1 |
| 158 | 1 | 8679 | 140123 | 153570 | 61.4 |

| | | | | | |
|---|---|---|---|---|---|
| 161 | 1 | 11265 | 206037 | 225461 | 39.1 |
| 162 | 1 | 10148 | 98842 | 176986 | 71.4 |
| 164 | 1 | 3037 | 107685 | 133707 | 71.1 |
| 172 | 1 | 20075 | 132465 | 119056 | 69.1 |

Cluster 2 Environmental variables

| Obs | Political_ | SEREXP | EXTREV | INVEST | indexx |
|---|---|---|---|---|---|
| 3 | 1 | 16344 | 79260 | 113479 | 90.5 |
| 4 | 1 | 6298 | 38038 | 46557 | 69.2 |
| 5 | 1 | 19112 | 91056 | 141045 | 92.5 |
| 8 | 1 | 3406 | 49960 | 42133 | 75 |
| 10 | 1 | 7766 | 20207 | 47093 | 59.5 |
| 12 | 1 | 9043 | 79608 | 72486 | 76.7 |
| 17 | 1 | 2407 | 30687 | 20557 | 80.1 |
| 20 | 1 | 2785 | 169876 | 130269 | 92.6 |
| 22 | 1 | 10737 | 156518 | 117529 | 89.4 |
| 25 | 1 | 4893 | 212063 | 149822 | 98.7 |
| 33 | 1 | 10157 | 49239 | 38655 | 84.1 |
| 34 | 1 | 6978 | 77330 | 83329 | 80.3 |
| 37 | 1 | 4989 | 159279 | 164235 | 83.8 |
| 38 | 1 | 8478 | 71422 | 154526 | 89.2 |
| 40 | 1 | 156 | 20828 | 13146 | 60.9 |
| 42 | 1 | 4714 | 38805 | 47601 | 64.4 |
| 45 | 1 | 11286 | 156174 | 107797 | 108.9 |
| 46 | 1 | 1132 | 68557 | 73878 | 90.2 |
| 52 | 1 | 7335 | 104651 | 181149 | 84.8 |
| 54 | 1 | 20 | 52092 | 52624 | 85.1 |
| 55 | 1 | 9517 | 28231 | 29288 | 72.7 |
| 58 | 1 | 832 | 52567 | 59687 | 85.4 |
| 60 | 1 | 13412 | 164581 | 103037 | 94.7 |
| 62 | 1 | 8426 | 38746 | 21797 | 59.3 |
| 73 | 1 | 2297 | 25568 | 44297 | 79.9 |
| 75 | 1 | 3823 | 151551 | 151402 | 79.8 |
| 79 | 1 | 13533 | 54765 | 51538 | 83 |
| 81 | 1 | 2612 | 199408 | 12285 | 90 |
| 83 | 1 | 9740 | 83456 | 97255 | 82.4 |
| 86 | 1 | 26218 | 49233 | 83055 | 87 |
| 95 | 1 | 558 | 34005 | 76775 | 76.4 |
| 96 | 1 | 774 | 44579 | 40364 | 69.3 |
| 97 | 1 | 29429 | 23852 | 71437 | 83.3 |
| 98 | 1 | 8365 | 90675 | 27380 | 84 |
| 103 | 1 | 10020 | 54687 | 123482 | 79.2 |
| 106 | 1 | 575 | 50617 | 64561 | 141.3 |
| 112 | 1 | 620 | 22294 | 7596 | 90.5 |
| 113 | 1 | 8675 | 40874 | 104380 | 70.5 |
| 114 | 1 | 2105 | 43639 | 23563 | 93.5 |
| 116 | 1 | 13039 | 34458 | 51732 | 64.6 |
| 117 | 1 | 8062 | 52961 | 94618 | 67 |
| 124 | 1 | 4652 | 39190 | 33032 | 121.3 |
| 126 | 1 | 4401 | 49837 | 40808 | 83.8 |

| | | | | | |
|---|---|---|---|---|---|
| 129 | 1 | 792 | 60123 | 178938 | 105.3 |
| 132 | 1 | 3307 | 29710 | 16587 | 61 |
| 135 | 1 | 10307 | 85568 | 69581 | 76.4 |
| 139 | 1 | 4530 | 21279 | 8078 | 66.4 |
| 140 | 1 | 7826 | 94314 | 69268 | 80.3 |
| 145 | 1 | 5348 | 90433 | 93153 | 99.5 |
| 147 | 1 | 17244 | 20328 | 31369 | 73.7 |
| 149 | 1 | 8896 | 81920 | 40319 | 79 |
| 150 | 1 | 18 | 10990 | 34519 | 75.9 |
| 151 | 1 | 7126 | 37324 | 33737 | 72.3 |
| 164 | 1 | 3037 | 107685 | 133707 | 71.1 |
| 168 | 1 | 9421 | 171326 | 132714 | 100.4 |
| 169 | 1 | 11631 | 79865 | 126424 | 95.2 |
| 171 | 1 | 14537 | 88939 | 55634 | 88.6 |

Cluster 3 Environmental variables

| Obs | Political_ | SEREXP | EXTREV | INVEST | indexx |
|---|---|---|---|---|---|
| 6 | 0 | 2768 | 45520 | 44573 | 66.1 |
| 16 | 0 | 9051 | 70917 | 99699 | 84.9 |
| 19 | 0 | 1474 | 82421 | 75630 | 78.3 |
| 21 | 0 | 220 | 12710 | 14721 | 60.6 |
| 23 | 0 | 21415 | 22862 | 20842 | 83.8 |
| 26 | 0 | 310 | 50836 | 101538 | 69 |
| 31 | 0 | 1473 | 59771 | 62012 | 69.5 |
| 32 | 0 | 4291 | 100496 | 115856 | 79.3 |
| 35 | 0 | 1885 | 11586 | 17085 | 38.2 |
| 48 | 0 | 5970 | 14924 | 24143 | 139.3 |
| 50 | 0 | 100 | 8439 | 12379 | 46.9 |
| 53 | 0 | 4599 | 124518 | 172645 | 75.6 |
| 64 | 0 | 9526 | 60897 | 46656 | 69.3 |
| 67 | 0 | 1029 | 4211 | 13073 | 51.7 |
| 70 | 0 | 671 | 57689 | 65742 | 47.7 |
| 71 | 0 | 7999 | 109900 | 71639 | 56 |
| 76 | 0 | 6635 | 19887 | 55892 | 55.3 |
| 82 | 0 | 5283 | 27955 | 17303 | 75.6 |
| 85 | 0 | 15467 | 74292 | 52049 | 63.5 |
| 89 | 0 | 3031 | 28675 | 193175 | 111.4 |
| 90 | 0 | 3283 | 33444 | 39997 | 65.2 |
| 94 | 0 | 6010 | 23441 | 50609 | 90.4 |
| 101 | 0 | 23233 | 87546 | 64501 | 57.5 |
| 102 | 0 | 4959 | 47577 | 80102 | 102.2 |
| 104 | 0 | 317 | 7253 | 23567 | 64.1 |
| 108 | 0 | 9789 | 62346 | 63439 | 99.2 |
| 109 | 0 | 14393 | 108568 | 194193 | 78.1 |
| 110 | 0 | 7073 | 112321 | 137766 | 72.8 |
| 118 | 0 | 8264 | 37180 | 88840 | 75.8 |
| 119 | 0 | 264 | 23669 | 29019 | 90.3 |
| 121 | 0 | 9804 | 45694 | 91308 | 65.4 |
| 122 | 0 | 78 | 8845 | 31621 | 55.1 |
| 125 | 0 | 396 | 17476 | 19009 | 50.7 |

| | | | | | |
|---|---|---|---|---|---|
| 127 | 0 | 1439 | 12551 | 44650 | 80.3 |
| 131 | 0 | 880 | 60332 | 367584 | 57.9 |
| 133 | 0 | 8111 | 10732 | 37623 | 68.2 |
| 136 | 0 | 22012 | 9103 | 13353 | 44.7 |
| 138 | 0 | 267 | 98217 | 89136 | 60.5 |
| 148 | 0 | 11056 | 42826 | 61834 | 69.6 |
| 152 | 0 | 689 | 18921 | 35889 | 60.1 |
| 153 | 0 | 5031 | 11396 | 40833 | 60.1 |
| 154 | 0 | 16550 | 41568 | 108425 | 70.4 |
| 155 | 0 | 3296 | 37942 | 99978 | 54 |
| 156 | 0 | 8040 | 96785 | 63405 | 95 |
| 159 | 0 | 5775 | 19968 | 25582 | 73.2 |
| 160 | 0 | 3540 | 14554 | 32614 | 80.9 |
| 167 | 0 | 14794 | 77860 | 25769 | 69.7 |
| 170 | 0 | 3920 | 30008 | 21200 | 52.2 |

Cluster 4 Environmental variables

| Obs | Political_ | SEREXP | EXTREV | INVEST | indexx |
|---|---|---|---|---|---|
| 2 | 1 | 4138 | 120210 | 246339 | 68.8 |
| 3 | 1 | 16344 | 79260 | 113479 | 90.5 |
| 5 | 1 | 19112 | 91056 | 141045 | 92.5 |
| 11 | 1 | 11303 | 258319 | 255764 | 60.6 |
| 15 | 1 | 15282 | 111207 | 159073 | 76 |
| 20 | 1 | 2785 | 169876 | 130269 | 92.6 |
| 22 | 1 | 10737 | 156518 | 117529 | 89.4 |
| 25 | 1 | 4893 | 212063 | 149822 | 98.7 |
| 27 | 1 | 134642 | 1441722 | 1471497 | 73 |
| 28 | 1 | 25349 | 156053 | 202670 | 93.1 |
| 29 | 1 | 20057 | 235080 | 124697 | 71.4 |
| 30 | 1 | 22171 | 540107 | 724765 | 112.5 |
| 36 | 1 | 43172 | 182243 | 270096 | 69.8 |
| 37 | 1 | 4989 | 159279 | 164235 | 83.8 |
| 38 | 1 | 8478 | 71422 | 154526 | 89.2 |
| 39 | 1 | 21782 | 179678 | 132755 | 86.8 |
| 41 | 1 | 18828 | 138630 | 81388 | 63.4 |
| 45 | 1 | 11286 | 156174 | 107797 | 108.9 |
| 49 | 1 | 12565 | 152372 | 134463 | 73.2 |
| 52 | 1 | 7335 | 104651 | 181149 | 84.8 |
| 59 | 1 | 27387 | 311219 | 243364 | 73 |
| 60 | 1 | 13412 | 164581 | 103037 | 94.7 |
| 61 | 1 | 18835 | 631984 | 330572 | 66.3 |
| 63 | 1 | 35014 | 351919 | 521460 | 90.1 |
| 65 | 1 | 18609 | 82938 | 188832 | 84.1 |
| 66 | 1 | 14721 | 964398 | 349469 | 99.8 |
| 68 | 1 | 8524 | 134725 | 125331 | 66.9 |
| 75 | 1 | 3823 | 151551 | 151402 | 79.8 |
| 78 | 1 | 27089 | 198964 | 255439 | 149.6 |
| 80 | 1 | 10210 | 89567 | 295270 | 82.4 |
| 84 | 1 | 30915 | 159600 | 178449 | 100.2 |
| 86 | 1 | 26218 | 49233 | 83055 | 87 |

| | | | | | |
|---|---|---|---|---|---|
| 91 | 1 | 11467 | 285486 | 296843 | 64.8 |
| 97 | 1 | 29429 | 23852 | 71437 | 83.3 |
| 106 | 1 | 575 | 50617 | 64561 | 141.3 |
| 111 | 1 | 3539 | 270536 | 249671 | 74 |
| 123 | 1 | 22534 | 81164 | 102157 | 70.3 |
| 124 | 1 | 4652 | 39190 | 33032 | 121.3 |
| 129 | 1 | 792 | 60123 | 178938 | 105.3 |
| 130 | 1 | 12254 | 236456 | 461035 | 61.2 |
| 134 | 1 | 44565 | 361435 | 885017 | 108.8 |
| 137 | 1 | 12840 | 123303 | 107309 | 68.3 |
| 141 | 1 | 8142 | 300494 | 233788 | 65.2 |
| 142 | 1 | 47697 | 286484 | 335683 | 71.7 |
| 145 | 1 | 5348 | 90433 | 93153 | 99.5 |
| 146 | 1 | 25373 | 263631 | 193963 | 68.1 |
| 157 | 1 | 97088 | 660668 | 666449 | 112.2 |
| 158 | 1 | 8679 | 140123 | 153570 | 61.4 |
| 161 | 1 | 11265 | 206037 | 225461 | 39.1 |
| 162 | 1 | 10148 | 98842 | 176986 | 71.4 |
| 163 | 1 | 15677 | 118669 | 208152 | 94.6 |
| 168 | 1 | 9421 | 171326 | 132714 | 100.4 |
| 169 | 1 | 11631 | 79865 | 126424 | 95.2 |
| 171 | 1 | 14537 | 88939 | 55634 | 88.6 |
| 172 | 1 | 20075 | 132465 | 119056 | 69.1 |

Cluster 5 Environmental variables

| Obs | Political_ | SEREXP | EXTREV | INVEST | indexx |
|---|---|---|---|---|---|
| 16 | 0 | 9051 | 70917 | 99699 | 84.9 |
| 23 | 0 | 21415 | 22862 | 20842 | 83.8 |
| 27 | 1 | 134642 | 1441722 | 1471497 | 73 |
| 30 | 1 | 22171 | 540107 | 724765 | 112.5 |
| 36 | 1 | 43172 | 182243 | 270096 | 69.8 |
| 43 | 0 | 25925 | 102365 | 110012 | 98.4 |
| 48 | 0 | 5970 | 14924 | 24143 | 139.3 |
| 53 | 0 | 4599 | 124518 | 172645 | 75.6 |
| 57 | 0 | 23066 | 139115 | 205796 | 71.9 |
| 59 | 1 | 27387 | 311219 | 243364 | 73 |
| 61 | 1 | 18835 | 631984 | 330572 | 66.3 |
| 63 | 1 | 35014 | 351919 | 521460 | 90.1 |
| 66 | 1 | 14721 | 964398 | 349469 | 99.8 |
| 69 | 0 | 30659 | 40706 | 210495 | 108 |
| 74 | 0 | 9413 | 52484 | 61737 | 181.8 |
| 77 | 0 | 23604 | 216677 | 286992 | 83 |
| 78 | 1 | 27089 | 198964 | 255439 | 149.6 |
| 84 | 1 | 30915 | 159600 | 178449 | 100.2 |
| 88 | 0 | 24989 | 426332 | 186291 | 79.3 |
| 89 | 0 | 3031 | 28675 | 193175 | 111.4 |
| 92 | 0 | 44504 | 410579 | 296602 | 87.2 |
| 94 | 0 | 6010 | 23441 | 50609 | 90.4 |
| 101 | 0 | 23233 | 87546 | 64501 | 57.5 |
| 102 | 0 | 4959 | 47577 | 80102 | 102.2 |

| | | | | | |
|---|---|---|---|---|---|
| 105 | 0 | 29580 | 184002 | 134731 | 114.9 |
| 106 | 1 | 575 | 50617 | 64561 | 141.3 |
| 108 | 0 | 9789 | 62346 | 63439 | 99.2 |
| 109 | 0 | 14393 | 108568 | 194193 | 78.1 |
| 120 | 0 | 21985 | 114358 | 157663 | 87.4 |
| 128 | 0 | 43020 | 136717 | 239704 | 100.7 |
| 130 | 1 | 12254 | 236456 | 461035 | 61.2 |
| 131 | 0 | 880 | 60332 | 367584 | 57.9 |
| 134 | 1 | 44565 | 361435 | 885017 | 108.8 |
| 142 | 1 | 47697 | 286484 | 335683 | 71.7 |
| 144 | 0 | 10930 | 107957 | 97338 | 135.3 |
| 156 | 0 | 8040 | 96785 | 63405 | 95 |
| 157 | 1 | 97088 | 660668 | 666449 | 112.2 |
| 165 | 0 | 43255 | 188687 | 94393 | 91.1 |
| 166 | 0 | 15547 | 184747 | 175590 | 85.2 |

# Appendix A 5-6a

**Analysis of Variance Report**

Page/Date/Time 1 4/15/2005 12:28:41 AM
Database
Response SEREXP

**Tests of Assumptions Section**

| Assumption | Test Value | Prob Level | Decision (0.001) |
|---|---|---|---|
| Skewness Normality of Residuals | 12.9878 | 0.000000 | Reject |
| Kurtosis Normality of Residuals | 9.3694 | 0.000000 | Reject |
| Omnibus Normality of Residuals | 256.4679 | 0.000000 | Reject |
| Modified-Levene Equal-Variance Test | 7.2806 | 0.000015 | Reject |

**Analysis of Variance Table**

| Source Term | DF | Sum of Squares | Mean Square | F-Ratio | Prob Level | Power (Alpha=0.001) |
|---|---|---|---|---|---|---|
| A: Group | 4 | 1.419266E+10 | 3.548164E+09 | 15.27 | 0.000000* | 0.999857 |
| S(A) | 243 | 5.646976E+10 | 2.323858E+08 | | | |
| Total (Adjusted) | 247 | 7.066241E+10 | | | | |
| Total | 248 | | | | | |

* Term significant at alpha = 0.001

**Kruskal-Wallis One-Way ANOVA on Ranks**
**Hypotheses**
Ho: All medians are equal.
Ha: At least two medians are different.

**Test Results**

| Method | DF | Chi-Square (H) | Prob Level | Decision(0.001) |
|---|---|---|---|---|
| Not Corrected for Ties | 4 | 65.26035 | 0.000000 | Reject Ho |
| Corrected for Ties | 4 | 65.26251 | 0.000000 | Reject Ho |

| | |
|---|---|
| Number Sets of Ties | 72 |
| Multiplicity Factor | 504 |

**Group Detail**

| Group | Count | Sum of Ranks | Mean Rank | Z-Value | Median |
|---|---|---|---|---|---|
| 1 | 49 | 5159.50 | 105.30 | -2.0920 | 8027 |
| 2 | 57 | 5668.00 | 99.44 | -3.0055 | 7126 |
| 3 | 48 | 4038.00 | 84.13 | -4.3422 | 4779 |
| 4 | 55 | 8988.00 | 163.42 | 4.5609 | 13412 |
| 5 | 39 | 7022.50 | 180.06 | 5.2692 | 22171 |

## Analysis of Variance Report

Page/Date/Time 2 4/15/2005 12:28:41 AM
Database
Response SEREXP

### Kruskal-Wallis Multiple-Comparison Z-Value Test

| SEREXP | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| 1 | 0.0000 | 0.4191 | 1.4533 | 4.1246 | 4.8571 |
| 2 | 0.4191 | 0.0000 | 1.0897 | 4.7187 | 5.4085 |
| 3 | 1.4533 | 1.0897 | 0.0000 | 5.5962 | 6.2038 |
| 4 | 4.1246 | 4.7187 | 5.5962 | 0.0000 | 1.1085 |
| 5 | 4.8571 | 5.4085 | 6.2038 | 1.1085 | 0.0000 |

Regular Test: Medians significantly different if z-value > 1.6449
Bonferroni Test: Medians significantly different if z-value > 2.5758

## Analysis of Variance Report

| | | |
|---|---|---|
| Page/Date/Time | 1 | 4/15/2005 12:28:41 AM |
| Database | | |
| Response | EXTREV | |

**Tests of Assumptions Section**

| Assumption | Test Value | Prob Level | Decision (0.001) |
|---|---|---|---|
| Skewness Normality of Residuals | 12.7784 | 0.000000 | Reject |
| Kurtosis Normality of Residuals | 9.1556 | 0.000000 | Reject |
| Omnibus Normality of Residuals | 247.1122 | 0.000000 | Reject |
| Modified-Levene Equal-Variance Test | 7.4268 | 0.000012 | Reject |

**Analysis of Variance Table**

| Source Term | DF | Sum of Squares | Mean Square | F-Ratio | Prob Level | Power (Alpha=0.001) |
|---|---|---|---|---|---|---|
| A: Group | 4 | 1.472215E+12 | 3.680537E+11 | 12.96 | 0.000000* | 0.998811 |
| S(A) | 243 | 6.898661E+12 | 2.838955E+10 | | | |
| Total (Adjusted) | 247 | 8.370876E+12 | | | | |
| Total | 248 | | | | | |

* Term significant at alpha = 0.001

**Kruskal-Wallis One-Way ANOVA on Ranks**

**Hypotheses**

Ho: All medians are equal.

Ha: At least two medians are different.

**Test Results**

| Method | DF | Chi-Square (H) | Prob Level | Decision(0.001) |
|---|---|---|---|---|
| Not Corrected for Ties | 4 | 80.2896 | 0.000000 | Reject Ho |
| Corrected for Ties | 4 | 80.29224 | 0.000000 | Reject Ho |

| | |
|---|---|
| Number Sets of Ties | 72 |
| Multiplicity Factor | 504 |

**Group Detail**

| Group | Count | Sum of Ranks | Mean Rank | Z-Value | Median |
|---|---|---|---|---|---|
| 1 | 49 | 6225.50 | 127.05 | 0.2779 | 107685 |
| 2 | 57 | 5601.00 | 98.26 | -3.1465 | 52961 |
| 3 | 48 | 3072.00 | 64.00 | -6.5066 | 37561 |
| 4 | 55 | 9633.00 | 175.15 | 5.9352 | 156174 |
| 5 | 39 | 6344.50 | 162.68 | 3.6206 | 139115 |

**Analysis of Variance Report**

Page/Date/Time 2 4/15/2005 12:28:41 AM
Database
Response EXTREV

**Kruskal-Wallis Multiple-Comparison Z-Value Test**

| EXTREV | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| 1 | 0.0000 | 2.0600 | 4.3281 | 3.4129 | 2.3145 |
| 2 | 2.0600 | 0.0000 | 2.4382 | 5.6703 | 4.3212 |
| 3 | 4.3281 | 2.4382 | 0.0000 | 7.8442 | 6.3811 |
| 4 | 3.4129 | 5.6703 | 7.8442 | 0.0000 | 0.8301 |
| 5 | 2.3145 | 4.3212 | 6.3811 | 0.8301 | 0.0000 |

Regular Test: Medians significantly different if z-value > 1.6449
Bonferroni Test: Medians significantly different if z-value > 2.5758

## Analysis of Variance Report

Page/Date/Time 1 4/15/2005 12:28:41 AM
Database
Response INVEST

**Tests of Assumptions Section**

| Assumption | Test Value | Prob Level | Decision (0.001) |
|---|---|---|---|
| Skewness Normality of Residuals | 12.7744 | 0.000000 | Reject |
| Kurtosis Normality of Residuals | 9.2251 | 0.000000 | Reject |
| Omnibus Normality of Residuals | 248.2874 | 0.000000 | Reject |
| Modified-Levene Equal-Variance Test | 6.8042 | 0.000033 | Reject |

**Analysis of Variance Table**

| Source Term | DF | Sum of Squares | Mean Square | F-Ratio | Prob Level | Power (Alpha=0.001) |
|---|---|---|---|---|---|---|
| A: Group | 4 | 1.661305E+12 | 4.153261E+11 | 15.08 | 0.000000* | 0.999830 |
| S(A) | 243 | 6.691598E+12 | 2.753744E+10 | | | |
| Total (Adjusted) | 247 | 8.352903E+12 | | | | |
| Total | 248 | | | | | |

* Term significant at alpha = 0.001

**Kruskal-Wallis One-Way ANOVA on Ranks**
**Hypotheses**
Ho: All medians are equal.
Ha: At least two medians are different.

**Test Results**

| Method | DF | Chi-Square (H) | Prob Level | Decision(0.001) |
|---|---|---|---|---|
| Not Corrected for Ties | 4 | 81.17963 | 0.000000 | Reject Ho |
| Corrected for Ties | 4 | 81.18231 | 0.000000 | Reject Ho |

| | |
|---|---|
| Number Sets of Ties | 72 |
| Multiplicity Factor | 504 |

**Group Detail**

| Group | Count | Sum of Ranks | Mean Rank | Z-Value | Median |
|---|---|---|---|---|---|
| 1 | 49 | 5683.50 | 115.99 | -0.9270 | 94618 |
| 2 | 57 | 5094.00 | 89.37 | -4.2132 | 64561 |
| 3 | 48 | 3695.00 | 76.98 | -5.1107 | 51329 |
| 4 | 55 | 9694.00 | 176.25 | 6.0652 | 164235 |
| 5 | 39 | 6709.50 | 172.04 | 4.5081 | 193175 |

## Analysis of Variance Report

Page/Date/Time 2 4/15/2005 12:28:41 AM
Database
Response INVEST

### Kruskal-Wallis Multiple-Comparison Z-Value Test

| INVEST | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| 1 | 0.0000 | 1.9050 | 2.6779 | 4.2766 | 3.6410 |
| 2 | 1.9050 | 0.0000 | 0.8816 | 6.4081 | 5.5457 |
| 3 | 2.6779 | 0.8816 | 0.0000 | 7.0064 | 6.1470 |
| 4 | 4.2766 | 6.4081 | 7.0064 | 0.0000 | 0.2808 |
| 5 | 3.6410 | 5.5457 | 6.1470 | 0.2808 | 0.0000 |

Regular Test: Medians significantly different if z-value > 1.6449
Bonferroni Test: Medians significantly different if z-value > 2.5758

## Analysis of Variance Report

| | | |
|---|---|---|
| Page/Date/Time | 1 | 4/15/2005 12:28:41 AM |
| Database | | |
| Response | indexx | |

**Tests of Assumptions Section**

| Assumption | Test Value | Prob Level | Decision (0.001) |
|---|---|---|---|
| Skewness Normality of Residuals | 6.0522 | 0.000000 | Reject |
| Kurtosis Normality of Residuals | 4.7692 | 0.000002 | Reject |
| Omnibus Normality of Residuals | 59.3742 | 0.000000 | Reject |
| Modified-Levene Equal-Variance Test | 5.2023 | 0.000489 | Reject |

**Analysis of Variance Table**

| Source Term | DF | Sum of Squares | Mean Square | F-Ratio | Prob Level | Power (Alpha=0.001) |
|---|---|---|---|---|---|---|
| A: Group | 4 | 35363.47 | 8840.867 | 25.71 | 0.000000* | 1.000000 |
| S(A) | 243 | 83556.1 | 343.8523 | | | |
| Total (Adjusted) | 247 | 118919.6 | | | | |
| Total | 248 | | | | | |

* Term significant at alpha = 0.001

**Kruskal-Wallis One-Way ANOVA on Ranks**

**Hypotheses**

Ho: All medians are equal.

Ha: At least two medians are different.

**Test Results**

| Method | DF | Chi-Square (H) | Prob Level | Decision(0.001) |
|---|---|---|---|---|
| Not Corrected for Ties | 4 | 88.97605 | 0.000000 | Reject Ho |
| Corrected for Ties | 4 | 88.9813 | 0.000000 | Reject Ho |

| | |
|---|---|
| Number Sets of Ties | 80 |
| Multiplicity Factor | 900 |

**Group Detail**

| Group | Count | Sum of Ranks | Mean Rank | Z-Value | Median |
|---|---|---|---|---|---|
| 1 | 49 | 2675.00 | 54.59 | -7.6154 | 61.4 |
| 2 | 57 | 8519.00 | 149.46 | 2.9929 | 83 |
| 3 | 48 | 4532.00 | 94.42 | -3.2354 | 69.15 |
| 4 | 55 | 8318.50 | 151.25 | 3.1343 | 84.1 |
| 5 | 39 | 6831.50 | 175.17 | 4.8048 | 90.4 |

**Analysis of Variance Report**

Page/Date/Time 2 4/15/2005 12:28:41 AM
Database
Response indexx

**Kruskal-Wallis Multiple-Comparison Z-Value Test**

| indexx | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| 1 | 0.0000 | 6.7883 | 2.7338 | 6.8590 | 7.8329 |
| 2 | 6.7883 | 0.0000 | 3.9167 | 0.1320 | 1.7247 |
| 3 | 2.7338 | 3.9167 | 0.0000 | 4.0108 | 5.2217 |
| 4 | 6.8590 | 0.1320 | 4.0108 | 0.0000 | 1.5930 |
| 5 | 7.8329 | 1.7247 | 5.2217 | 1.5930 | 0.0000 |

Regular Test: Medians significantly different if z-value > 1.6449
Bonferroni Test: Medians significantly different if z-value > 2.5758

# Appendix A 5-6b

**Analysis of Variance Report**

Page/Date/Time 1 4/15/2005 12:26:00 AM
Database
Response SEREXP

**Tests of Assumptions Section**

| Assumption | Test Value | Prob Level | Decision (0.001) |
|---|---|---|---|
| Skewness Normality of Residuals | 12.9878 | 0.000000 | Reject |
| Kurtosis Normality of Residuals | 9.3694 | 0.000000 | Reject |
| Omnibus Normality of Residuals | 256.4679 | 0.000000 | Reject |
| Modified-Levene Equal-Variance Test | 7.2806 | 0.000015 | Reject |

**Analysis of Variance Table**

| Source Term | DF | Sum of Squares | Mean Square | F-Ratio | Prob Level | Power (Alpha=0.001) |
|---|---|---|---|---|---|---|
| A: Group | 4 | 1.419266E+10 | 3.548164E+09 | 15.27 | 0.000000* | 0.999857 |
| S(A) | 243 | 5.646976E+10 | 2.323858E+08 | | | |
| Total (Adjusted) | 247 | 7.066241E+10 | | | | |
| Total | 248 | | | | | |

* Term significant at alpha = 0.001

**Kruskal-Wallis One-Way ANOVA on Ranks**
**Hypotheses**
Ho: All medians are equal.
Ha: At least two medians are different.

**Test Results**

| Method | DF | Chi-Square (H) | Prob Level | Decision(0.001) |
|---|---|---|---|---|
| Not Corrected for Ties | 4 | 65.26035 | 0.000000 | Reject Ho |
| Corrected for Ties | 4 | 65.26251 | 0.000000 | Reject Ho |

| | |
|---|---|
| Number Sets of Ties | 72 |
| Multiplicity Factor | 504 |

**Group Detail**

| Group | Count | Sum of Ranks | Mean Rank | Z-Value | Median |
|---|---|---|---|---|---|
| 1 | 49 | 5159.50 | 105.30 | -2.0920 | 8027 |
| 2 | 57 | 5668.00 | 99.44 | -3.0055 | 7126 |
| 3 | 48 | 4038.00 | 84.13 | -4.3422 | 4779 |
| 4 | 55 | 8988.00 | 163.42 | 4.5609 | 13412 |
| 5 | 39 | 7022.50 | 180.06 | 5.2692 | 22171 |

**Analysis of Variance Report**

Page/Date/Time 2 4/15/2005 12:26:00 AM
Database
Response SEREXP

**Kruskal-Wallis Multiple-Comparison Z-Value Test**

| SEREXP | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| 1 | 0.0000 | 0.4191 | 1.4533 | 4.1246 | 4.8571 |
| 2 | 0.4191 | 0.0000 | 1.0897 | 4.7187 | 5.4085 |
| 3 | 1.4533 | 1.0897 | 0.0000 | 5.5962 | 6.2038 |
| 4 | 4.1246 | 4.7187 | 5.5962 | 0.0000 | 1.1085 |
| 5 | 4.8571 | 5.4085 | 6.2038 | 1.1085 | 0.0000 |

Regular Test: Medians significantly different if z-value > 1.4395
Bonferroni Test: Medians significantly different if z-value > 2.4324

## Analysis of Variance Report

| | | |
|---|---|---|
| Page/Date/Time | 1 | 4/15/2005 12:26:00 AM |
| Database | | |
| Response | EXTREV | |

**Tests of Assumptions Section**

| Assumption | Test Value | Prob Level | Decision (0.001) |
|---|---|---|---|
| Skewness Normality of Residuals | 12.7784 | 0.000000 | Reject |
| Kurtosis Normality of Residuals | 9.1556 | 0.000000 | Reject |
| Omnibus Normality of Residuals | 247.1122 | 0.000000 | Reject |
| Modified-Levene Equal-Variance Test | 7.4268 | 0.000012 | Reject |

**Analysis of Variance Table**

| Source Term | DF | Sum of Squares | Mean Square | F-Ratio | Prob Level | Power (Alpha=0.001) |
|---|---|---|---|---|---|---|
| A: Group | 4 | 1.472215E+12 | 3.680537E+11 | 12.96 | 0.000000* | 0.998811 |
| S(A) | 243 | 6.898661E+12 | 2.838955E+10 | | | |
| Total (Adjusted) | 247 | 8.370876E+12 | | | | |
| Total | 248 | | | | | |

* Term significant at alpha = 0.001

**Kruskal-Wallis One-Way ANOVA on Ranks**
**Hypotheses**
Ho: All medians are equal.
Ha: At least two medians are different.

**Test Results**

| Method | DF | Chi-Square (H) | Prob Level | Decision(0.001) |
|---|---|---|---|---|
| Not Corrected for Ties | 4 | 80.2896 | 0.000000 | Reject Ho |
| Corrected for Ties | 4 | 80.29224 | 0.000000 | Reject Ho |

| | |
|---|---|
| Number Sets of Ties | 72 |
| Multiplicity Factor | 504 |

**Group Detail**

| Group | Count | Sum of Ranks | Mean Rank | Z-Value | Median |
|---|---|---|---|---|---|
| 1 | 49 | 6225.50 | 127.05 | 0.2779 | 107685 |
| 2 | 57 | 5601.00 | 98.26 | -3.1465 | 52961 |
| 3 | 48 | 3072.00 | 64.00 | -6.5066 | 37561 |
| 4 | 55 | 9633.00 | 175.15 | 5.9352 | 156174 |
| 5 | 39 | 6344.50 | 162.68 | 3.6206 | 139115 |

## Analysis of Variance Report

Page/Date/Time 2 4/15/2005 12:26:00 AM
Database
Response EXTREV

### Kruskal-Wallis Multiple-Comparison Z-Value Test

| EXTREV | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| 1 | 0.0000 | 2.0600 | 4.3281 | 3.4129 | 2.3145 |
| 2 | 2.0600 | 0.0000 | 2.4382 | 5.6703 | 4.3212 |
| 3 | 4.3281 | 2.4382 | 0.0000 | 7.8442 | 6.3811 |
| 4 | 3.4129 | 5.6703 | 7.8442 | 0.0000 | 0.8301 |
| 5 | 2.3145 | 4.3212 | 6.3811 | 0.8301 | 0.0000 |

Regular Test: Medians significantly different if z-value > 1.4395
Bonferroni Test: Medians significantly different if z-value > 2.4324

**Analysis of Variance Report**

| | |
|---|---|
| Page/Date/Time | 1 4/15/2005 12:26:00 AM |
| Database | |
| Response | INVEST |

**Tests of Assumptions Section**

| Assumption | Test Value | Prob Level | Decision (0.001) |
|---|---|---|---|
| Skewness Normality of Residuals | 12.7744 | 0.000000 | Reject |
| Kurtosis Normality of Residuals | 9.2251 | 0.000000 | Reject |
| Omnibus Normality of Residuals | 248.2874 | 0.000000 | Reject |
| Modified-Levene Equal-Variance Test | 6.8042 | 0.000033 | Reject |

**Analysis of Variance Table**

| Source Term | DF | Sum of Squares | Mean Square | F-Ratio | Prob Level | Power (Alpha=0.001) |
|---|---|---|---|---|---|---|
| A: Group | 4 | 1.661305E+12 | 4.153261E+11 | 15.08 | 0.000000* | 0.999830 |
| S(A) | 243 | 6.691598E+12 | 2.753744E+10 | | | |
| Total (Adjusted) | 247 | 8.352903E+12 | | | | |
| Total | 248 | | | | | |

* Term significant at alpha = 0.001

**Kruskal-Wallis One-Way ANOVA on Ranks**
**Hypotheses**
Ho: All medians are equal.
Ha: At least two medians are different.

**Test Results**

| Method | DF | Chi-Square (H) | Prob Level | Decision(0.001) |
|---|---|---|---|---|
| Not Corrected for Ties | 4 | 81.17963 | 0.000000 | Reject Ho |
| Corrected for Ties | 4 | 81.18231 | 0.000000 | Reject Ho |

| | |
|---|---|
| Number Sets of Ties | 72 |
| Multiplicity Factor | 504 |

**Group Detail**

| Group | Count | Sum of Ranks | Mean Rank | Z-Value | Median |
|---|---|---|---|---|---|
| 1 | 49 | 5683.50 | 115.99 | -0.9270 | 94618 |
| 2 | 57 | 5094.00 | 89.37 | -4.2132 | 64561 |
| 3 | 48 | 3695.00 | 76.98 | -5.1107 | 51329 |
| 4 | 55 | 9694.00 | 176.25 | 6.0652 | 164235 |
| 5 | 39 | 6709.50 | 172.04 | 4.5081 | 193175 |

## Analysis of Variance Report

Page/Date/Time 2 4/15/2005 12:26:00 AM
Database
Response INVEST

### Kruskal-Wallis Multiple-Comparison Z-Value Test

| INVEST | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| 1 | 0.0000 | 1.9050 | 2.6779 | 4.2766 | 3.6410 |
| 2 | 1.9050 | 0.0000 | 0.8816 | 6.4081 | 5.5457 |
| 3 | 2.6779 | 0.8816 | 0.0000 | 7.0064 | 6.1470 |
| 4 | 4.2766 | 6.4081 | 7.0064 | 0.0000 | 0.2808 |
| 5 | 3.6410 | 5.5457 | 6.1470 | 0.2808 | 0.0000 |

Regular Test: Medians significantly different if z-value > 1.4395
Bonferroni Test: Medians significantly different if z-value > 2.4324

## Analysis of Variance Report

| | | |
|---|---|---|
| Page/Date/Time | 1 | 4/15/2005 12:26:00 AM |
| Database | | |
| Response | indexx | |

**Tests of Assumptions Section**

| Assumption | Test Value | Prob Level | Decision (0.001) |
|---|---|---|---|
| Skewness Normality of Residuals | 6.0522 | 0.000000 | Reject |
| Kurtosis Normality of Residuals | 4.7692 | 0.000002 | Reject |
| Omnibus Normality of Residuals | 59.3742 | 0.000000 | Reject |
| Modified-Levene Equal-Variance Test | 5.2023 | 0.000489 | Reject |

**Analysis of Variance Table**

| Source Term | DF | Sum of Squares | Mean Square | F-Ratio | Prob Level | Power (Alpha=0.001) |
|---|---|---|---|---|---|---|
| A: Group | 4 | 35363.47 | 8840.867 | 25.71 | 0.000000* | 1.000000 |
| S(A) | 243 | 83556.1 | 343.8523 | | | |
| Total (Adjusted) | 247 | 118919.6 | | | | |
| Total | 248 | | | | | |

* Term significant at alpha = 0.001

**Kruskal-Wallis One-Way ANOVA on Ranks**
**Hypotheses**
Ho: All medians are equal.
Ha: At least two medians are different.

**Test Results**

| Method | DF | Chi-Square (H) | Prob Level | Decision(0.001) |
|---|---|---|---|---|
| Not Corrected for Ties | 4 | 88.97605 | 0.000000 | Reject Ho |
| Corrected for Ties | 4 | 88.9813 | 0.000000 | Reject Ho |

| | |
|---|---|
| Number Sets of Ties | 80 |
| Multiplicity Factor | 900 |

**Group Detail**

| Group | Count | Sum of Ranks | Mean Rank | Z-Value | Median |
|---|---|---|---|---|---|
| 1 | 49 | 2675.00 | 54.59 | -7.6154 | 61.4 |
| 2 | 57 | 8519.00 | 149.46 | 2.9929 | 83 |
| 3 | 48 | 4532.00 | 94.42 | -3.2354 | 69.15 |
| 4 | 55 | 8318.50 | 151.25 | 3.1343 | 84.1 |
| 5 | 39 | 6831.50 | 175.17 | 4.8048 | 90.4 |

**Analysis of Variance Report**

Page/Date/Time 2 4/15/2005 12:26:00 AM
Database
Response indexx

**Kruskal-Wallis Multiple-Comparison Z-Value Test**

| indexx | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| 1 | 0.0000 | 6.7883 | 2.7338 | 6.8590 | 7.8329 |
| 2 | 6.7883 | 0.0000 | 3.9167 | 0.1320 | 1.7247 |
| 3 | 2.7338 | 3.9167 | 0.0000 | 4.0108 | 5.2217 |
| 4 | 6.8590 | 0.1320 | 4.0108 | 0.0000 | 1.5930 |
| 5 | 7.8329 | 1.7247 | 5.2217 | 1.5930 | 0.0000 |

Regular Test: Medians significantly different if z-value > 1.4395
Bonferroni Test: Medians significantly different if z-value > 2.4324