

## **APPENDIX B**

## NeuralWorks PREDICT program Tutorial

Neural networks are useful when an unknown relationship exists between a set of input and output data. PREDICT program can detect trends in data, generalize the data, and predict the outcome with 3 steps: (1) data collection and preprocessing, (2) building and training the network, and (3) testing and validating the network. Following is the steps to run the program.

### 1. Loading the data

- Start Excel → File | Open → Select the data file (\*.xls) → Click **Open**

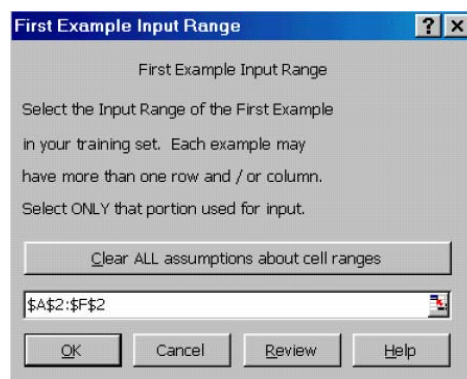
### 2. Creating a new model

- Predict → Select **Wizard** mode → Click New → ‘Select a Name Directory for New Net’ dialog appears → Confirm that the Save as type as (\*.npr) → Click **Save**

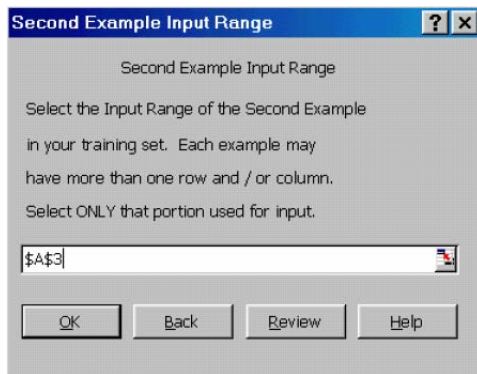
### 3. Characterizing the model

#### i. Data Characteristics

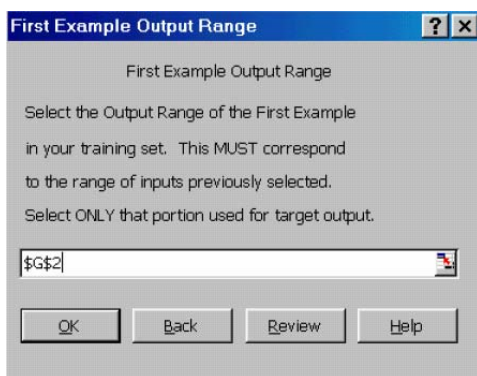
- Specifying the first example input range → Select the first rows of cells containing the input data (in this example the second row cells A2: F2) → Click **OK**



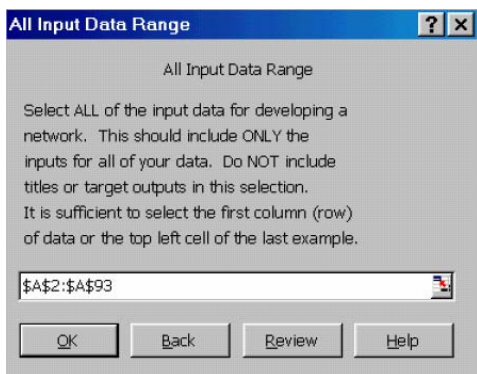
- Specifying the second example input range → Select the first cell (A3) of the second set of input (A3:F3) → Click **OK**



- Specifying the first example output range → Select the cell(s) containing the first output rows (G2) → Click **OK**



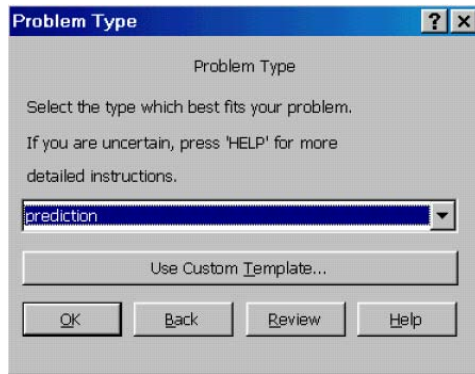
- Specifying the all input data range → Select the first column range for the input (A2: A93) → Click **OK**



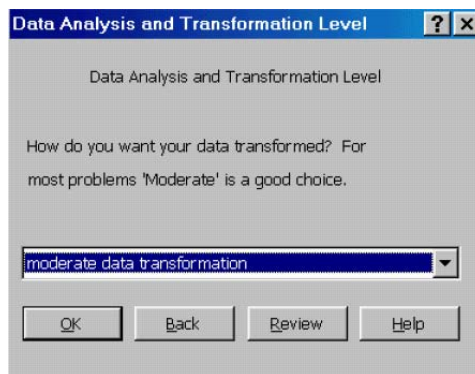
- Specifying the field names range → Select the first cell of the field name A1 from (A1:G1) → Click **OK**

## ii. Problem Characteristics

- Specifying the Problem Type → Select **prediction** → Click **OK**

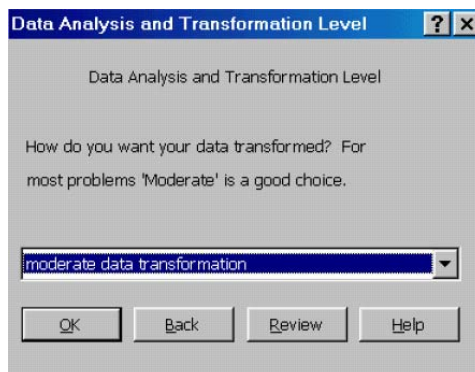


- Specifying the Noise Level → Select **moderately noisy data** → Click **OK**

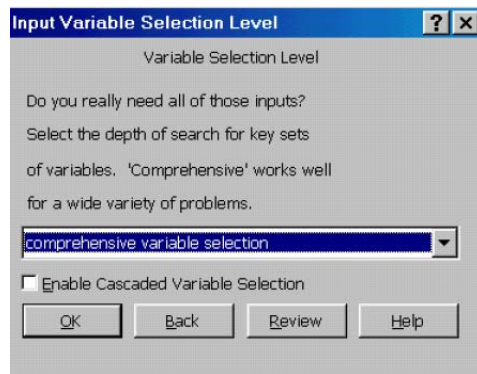


### iii. Neural Network Model Characteristics

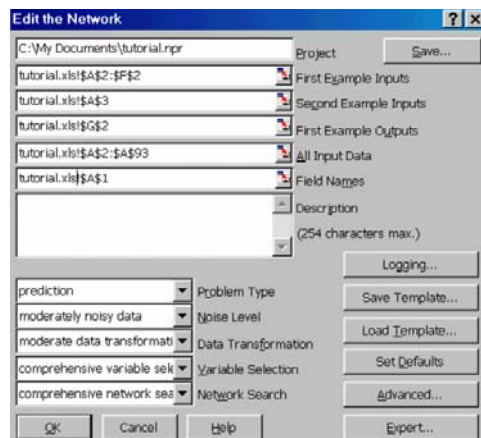
- Specifying a Data Analysis and Transformation Level → Select **moderate data transformation** → Click **OK**



- Specifying the Input Variable Selection Level → Select **comprehensive variable selection** → Make sure **Enable Cascaded Variable Selection** is **not selected** → Click **OK**

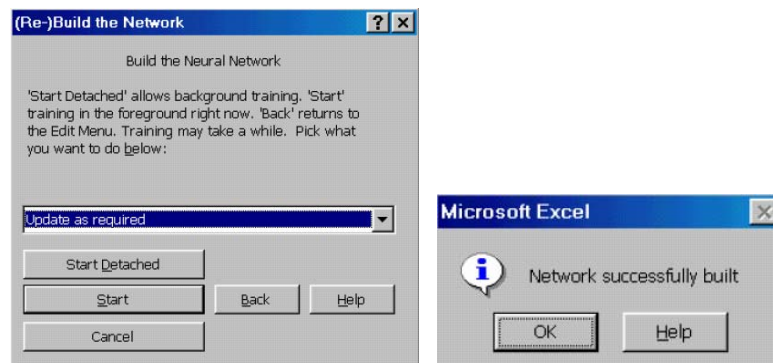


- Specifying the Neural Network Search Level → Select **comprehensive network search** → Click on **Review** → **Edit the Network** dialog box appears
- **Reviewing the Network Parameters** → This box allows you to review and edit the parameters entered. → If everything is ok → Click **OK**



#### 4. Building and training the network

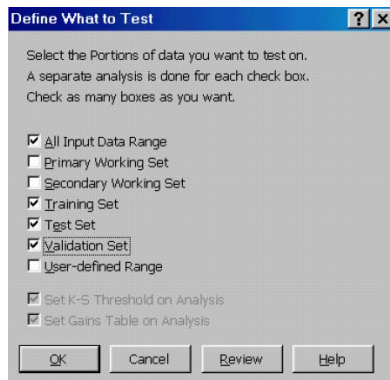
- In the **(Re-) Build the Network** dialog box, select **Update as required**. → Click **Start** → when **Network successfully built** dialog box appear → Click **OK**



- Click the **Predict** menu → Click **Save**

## 5. Testing the model

- Choose **Predict | Test** → **Define what to Test** dialog box appears → Select data sets as needed → Click **OK** → **Test Results Range** dialog box appears → Select the cells where the results table will be written → Click **OK**



- Then the statistical Table is shown.

## 6. Analyzing the results

### I. Interpreting the Statistical Summary

- Linear correlation value, absolute error, root mean square, and confidence interval are given for interpretation.

### II. Comparing the Actual and Predicted Output values

- To compute the predicted outputs → Choose **Predict | Run** → **Run formula Inputs** dialog box appears → Select the range of input variable data to be used for prediction → Click **OK** → **Run Formula Outputs** dialog box appears → Select the cells where the output will be placed → Click **Go**.

## 7. Closing the Model and Microsoft Excel

- Select **Predict | Close** → Click **Yes** to save the model.