ETDs (Electronic Theses and Dissertations) Recommendation System

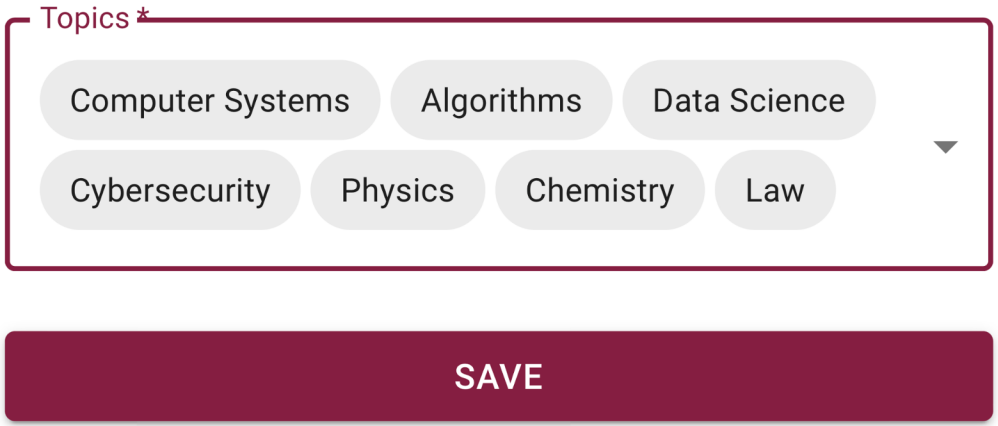
Talia Blakemore and Long Phan

Outline

1. Overview of Project
2. Timeline
3. General Approach
4. Deliverables
5. Testing & Evaluation
6. Acknowledgements
7. References

Overview

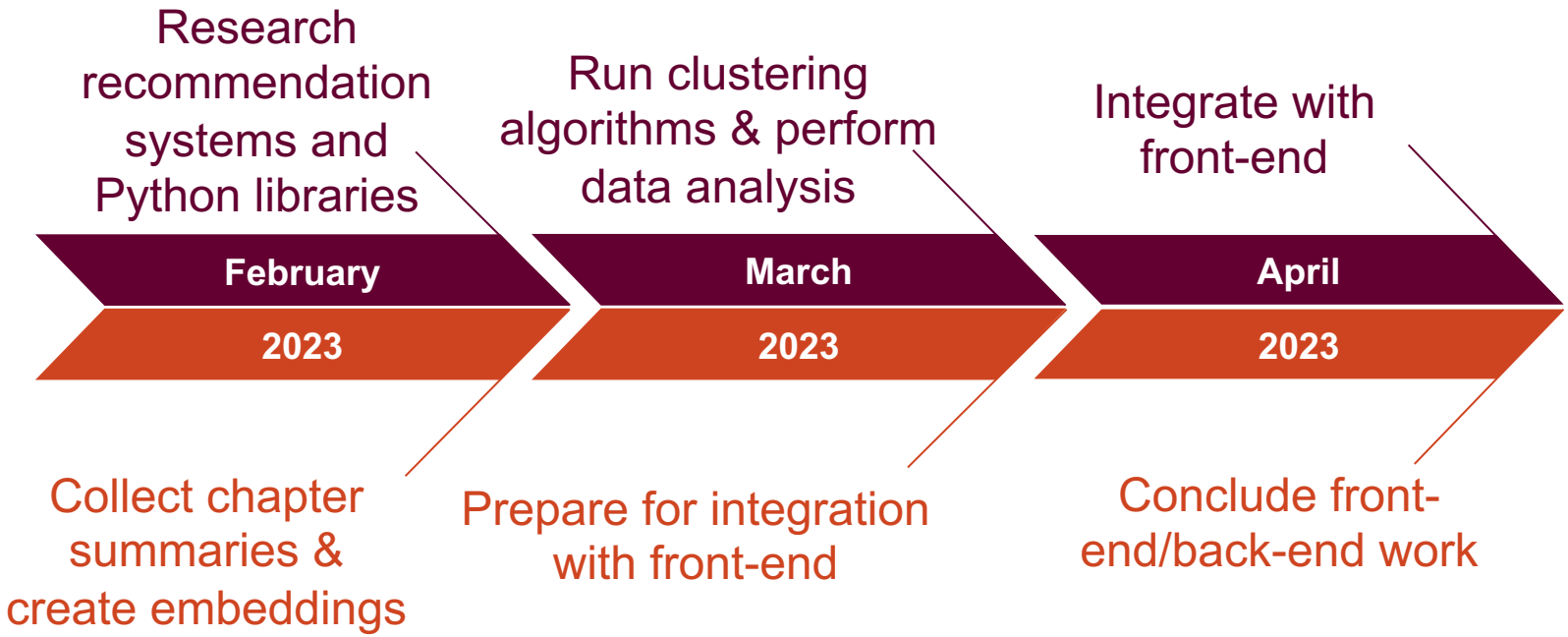
- Client: Satvik Chekuri
- Current System:
  - Recommendation system is built upon interests supplied by the user
  - Uses document titles and abstracts to evaluate similarity between documents



Overview

- We want to use **chapter summaries** to evaluate similarity
  - More efficient and accurate
  - Summaries are based on narrower topics
- Previous capstone group has created chapter summaries for over 5000 ETDS, resulting in over ~20,000 chapter summaries
  - We are using 5000 summaries

Timeline


Research recommendation systems and Python libraries
February
2023
Collect chapter summaries & create embeddings
Run clustering algorithms & perform data analysis
March
2023
Prepare for integration with front-end
Integrate with front-end
April
2023
Conclude front-end/back-end work

General Approach

Retrieve chapter summaries from summarization API

General Approach

Create embeddings using Sentence-Transformers Package

General Approach

Perform dimensionality reduction

General Approach

User performs a search, specifying

- Clustering algorithm
- Number of documents to cluster, *n*
- Number of clusters/Minimum Cluster size
- Whether to use PCA

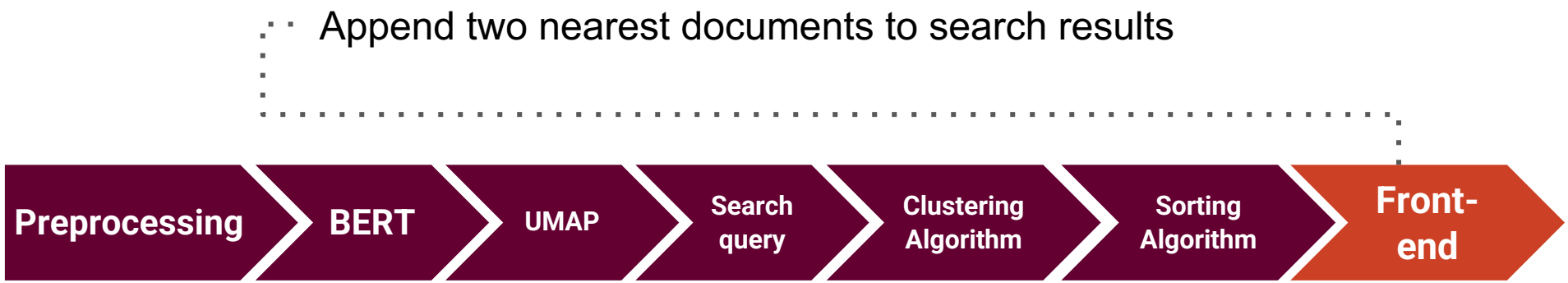
General Approach

KMeans, DBScan or HDBScan using user specifications

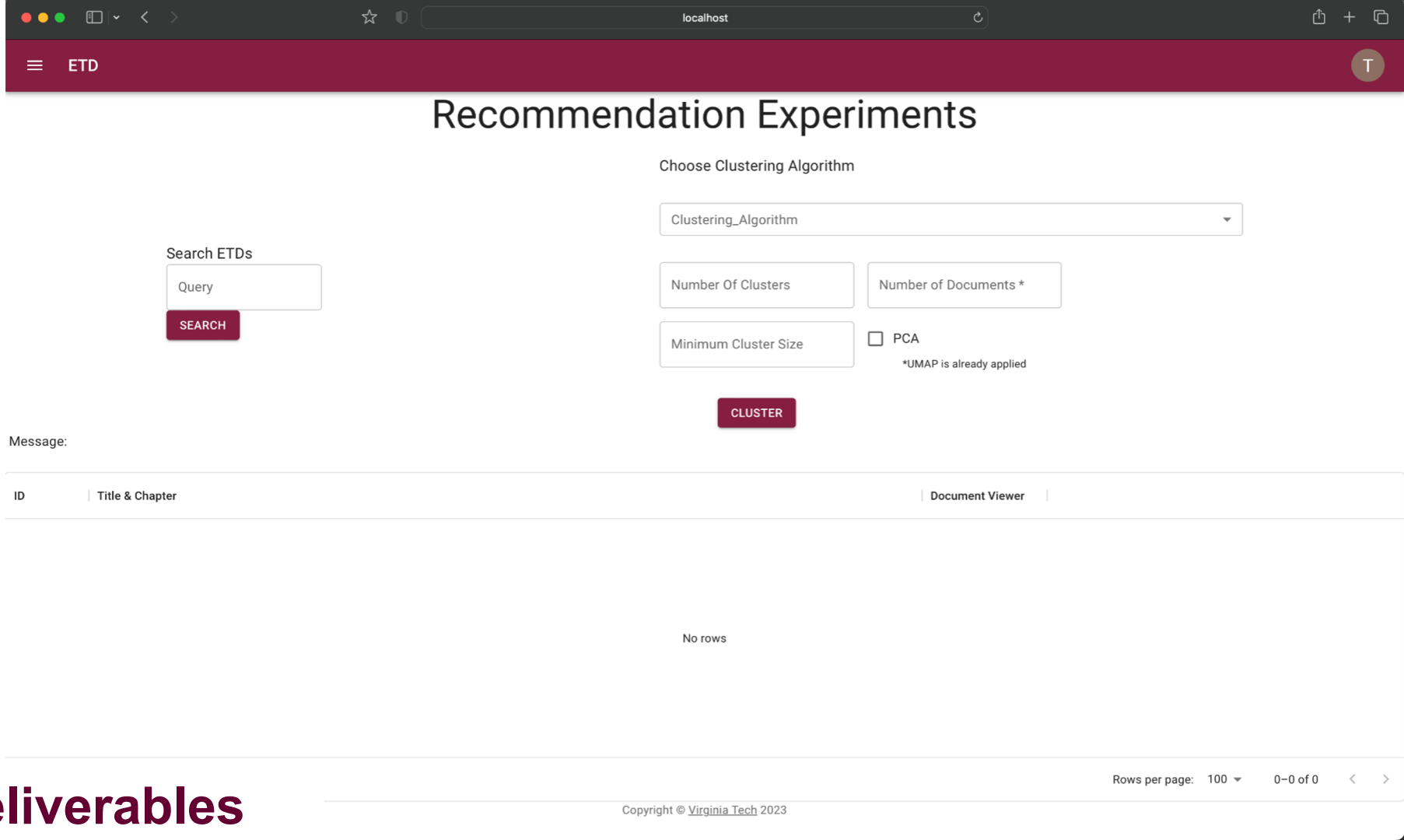
General Approach

Sort output of each cluster to retrieve two nearest results to first *n* chapters

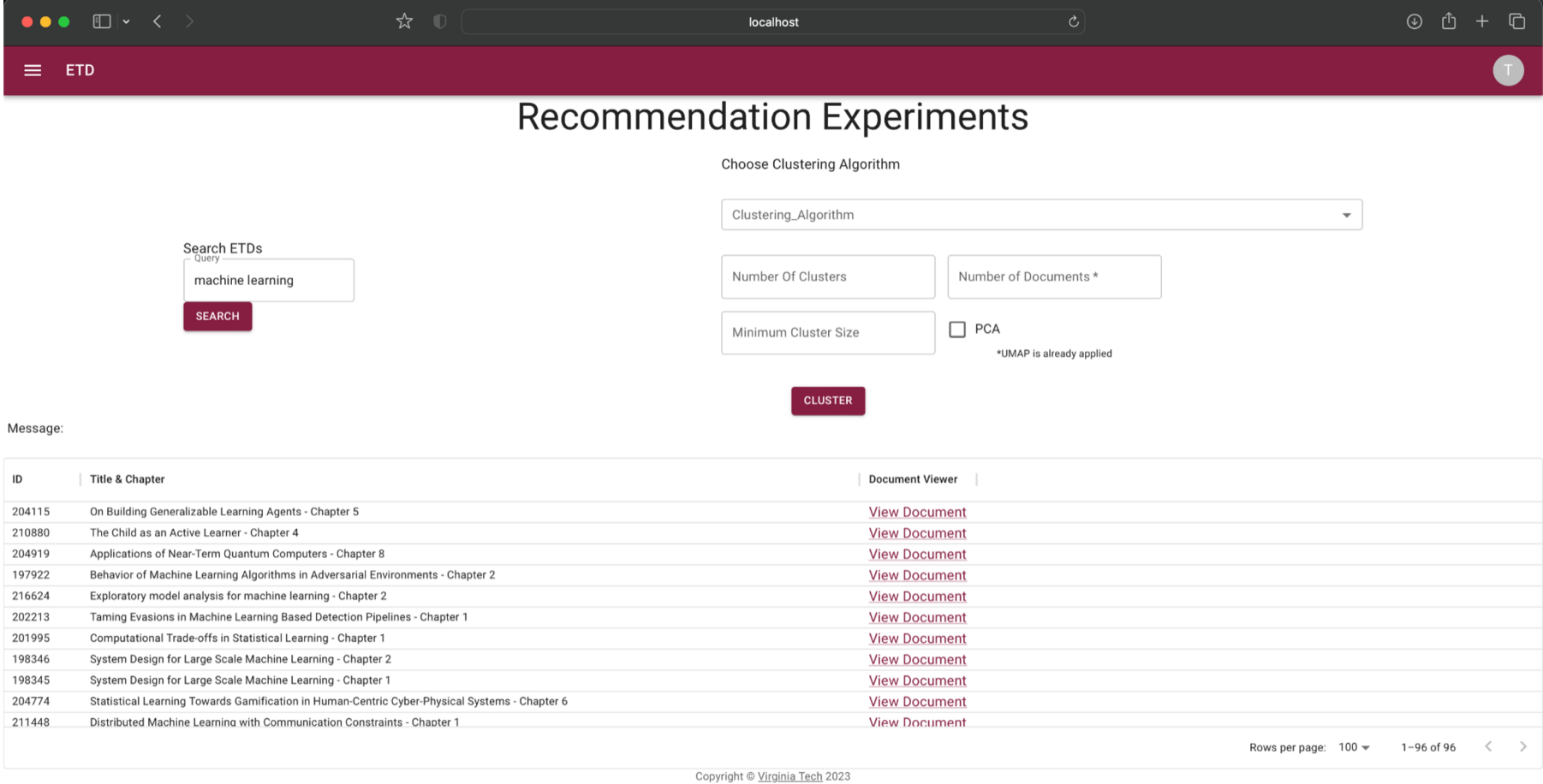
General Approach



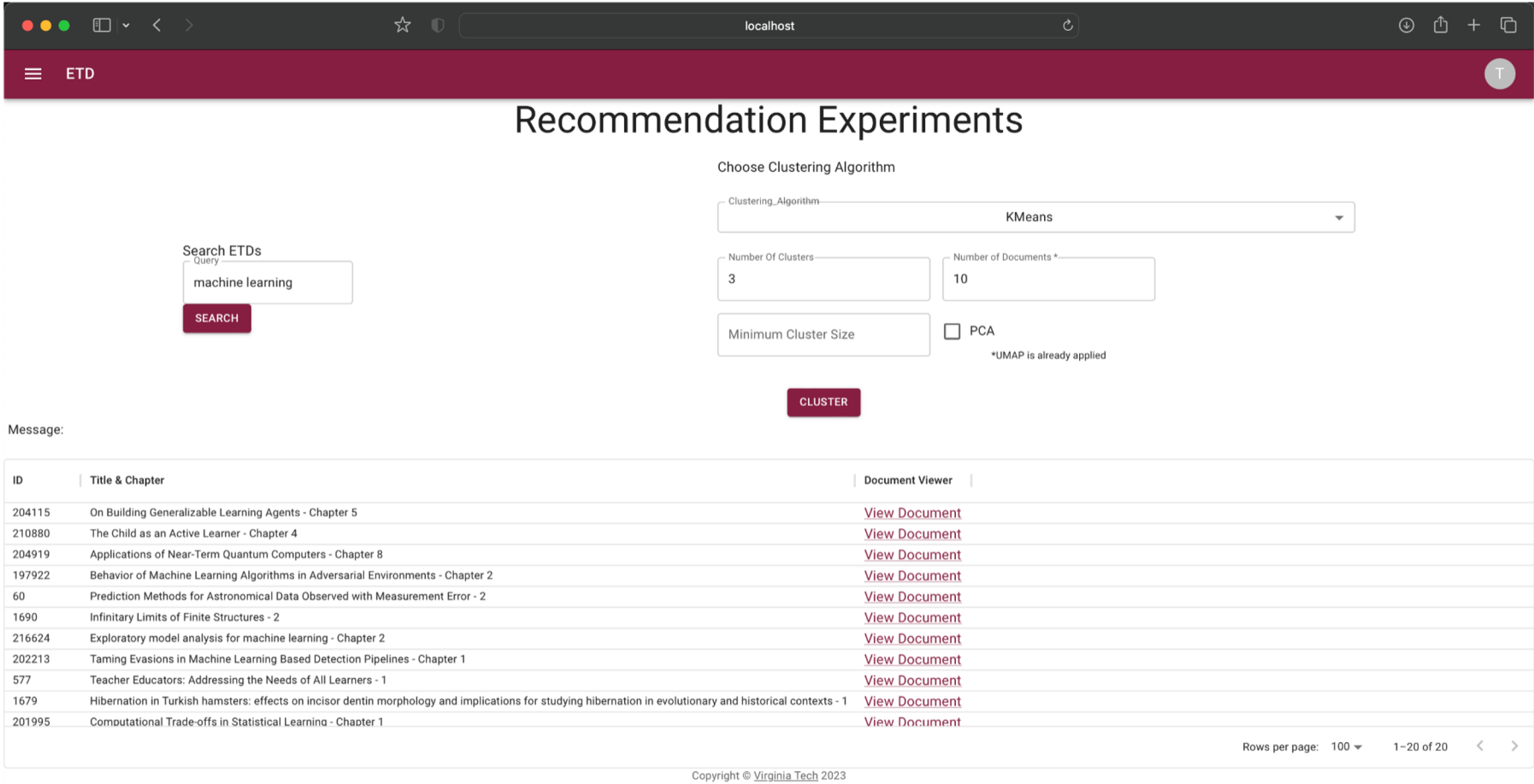
General Approach



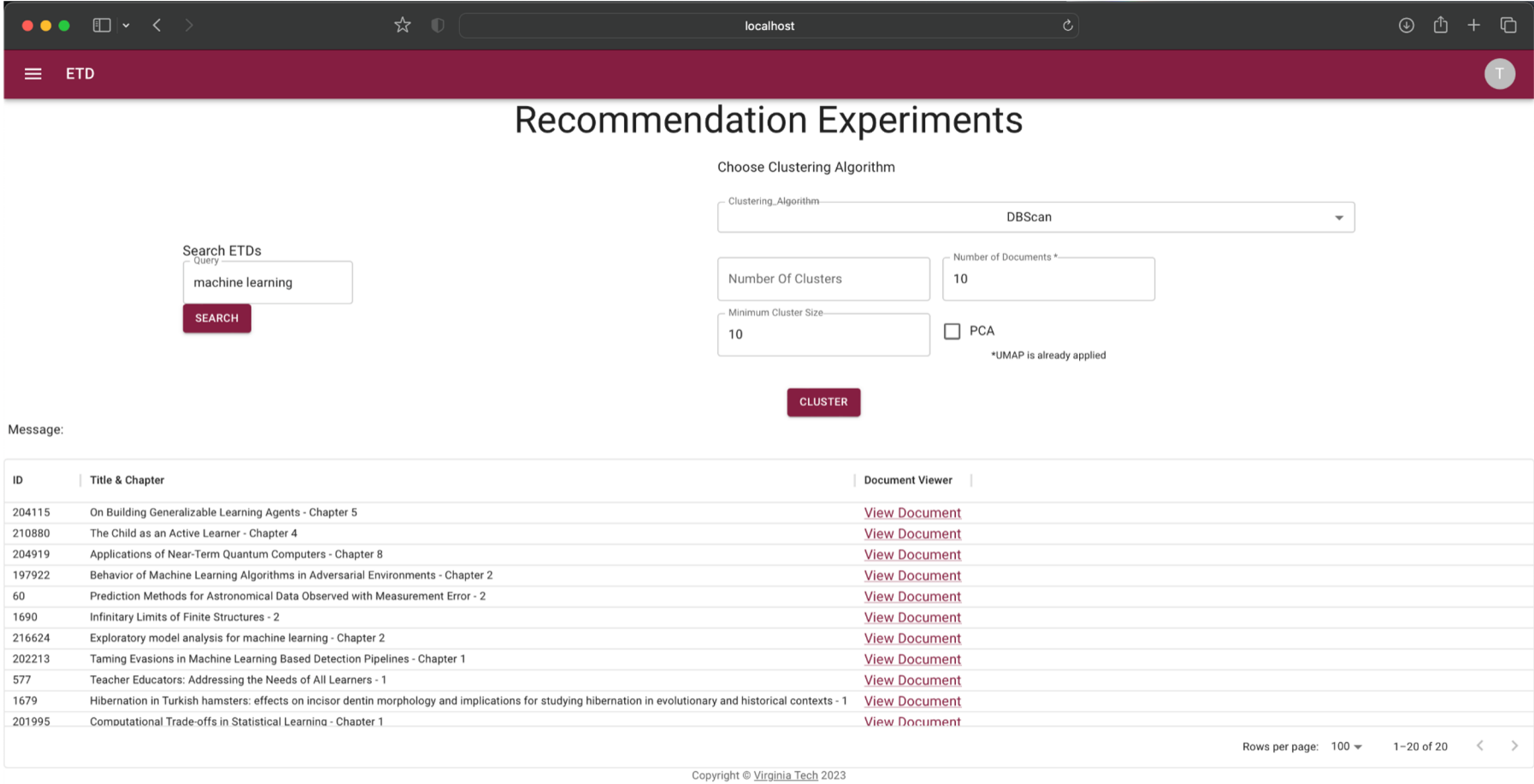
Deliverables



Deliverables

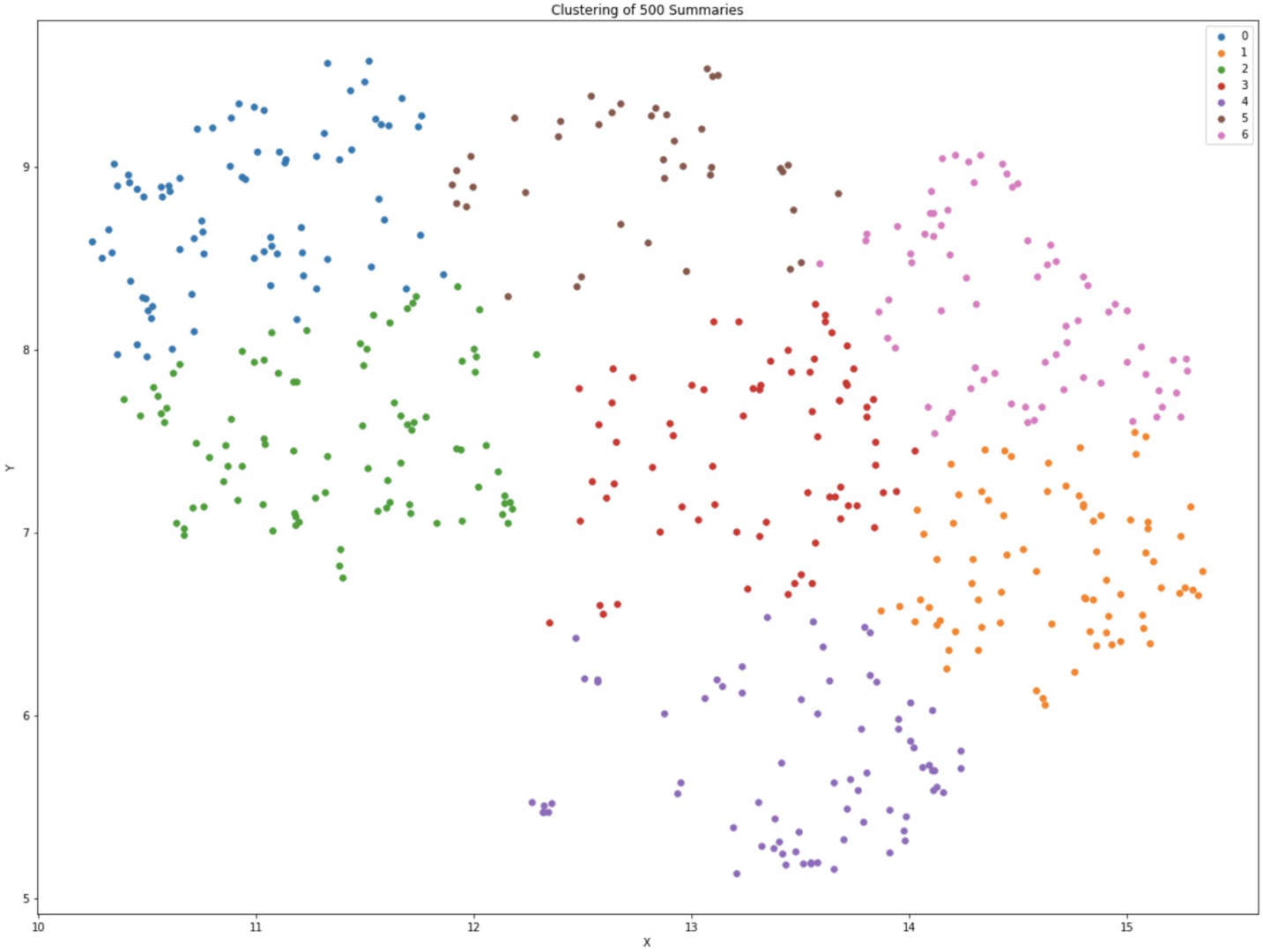


Deliverables - KMeans

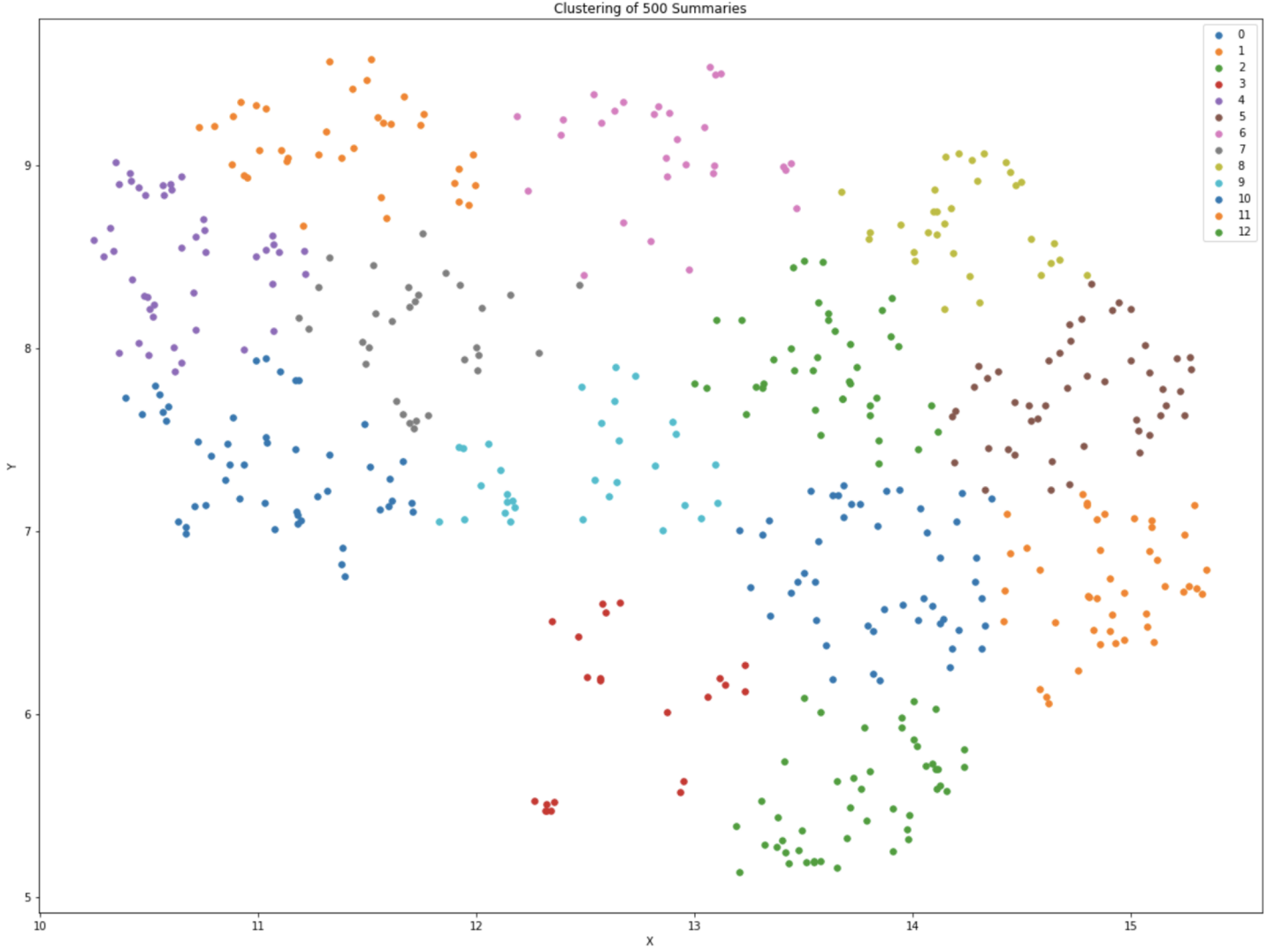


Deliverables - DBScan

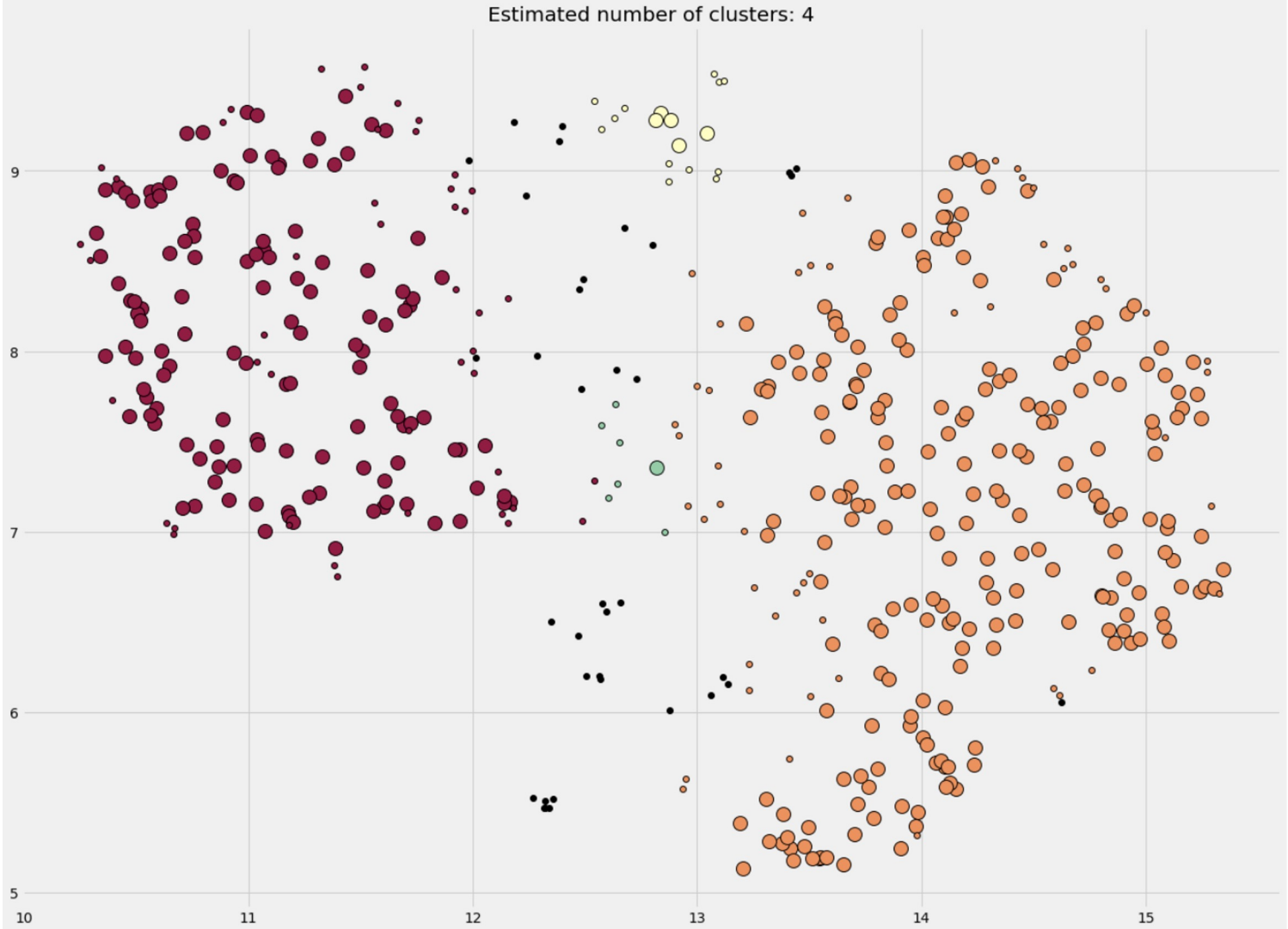
Testing & Evaluation - KMeans



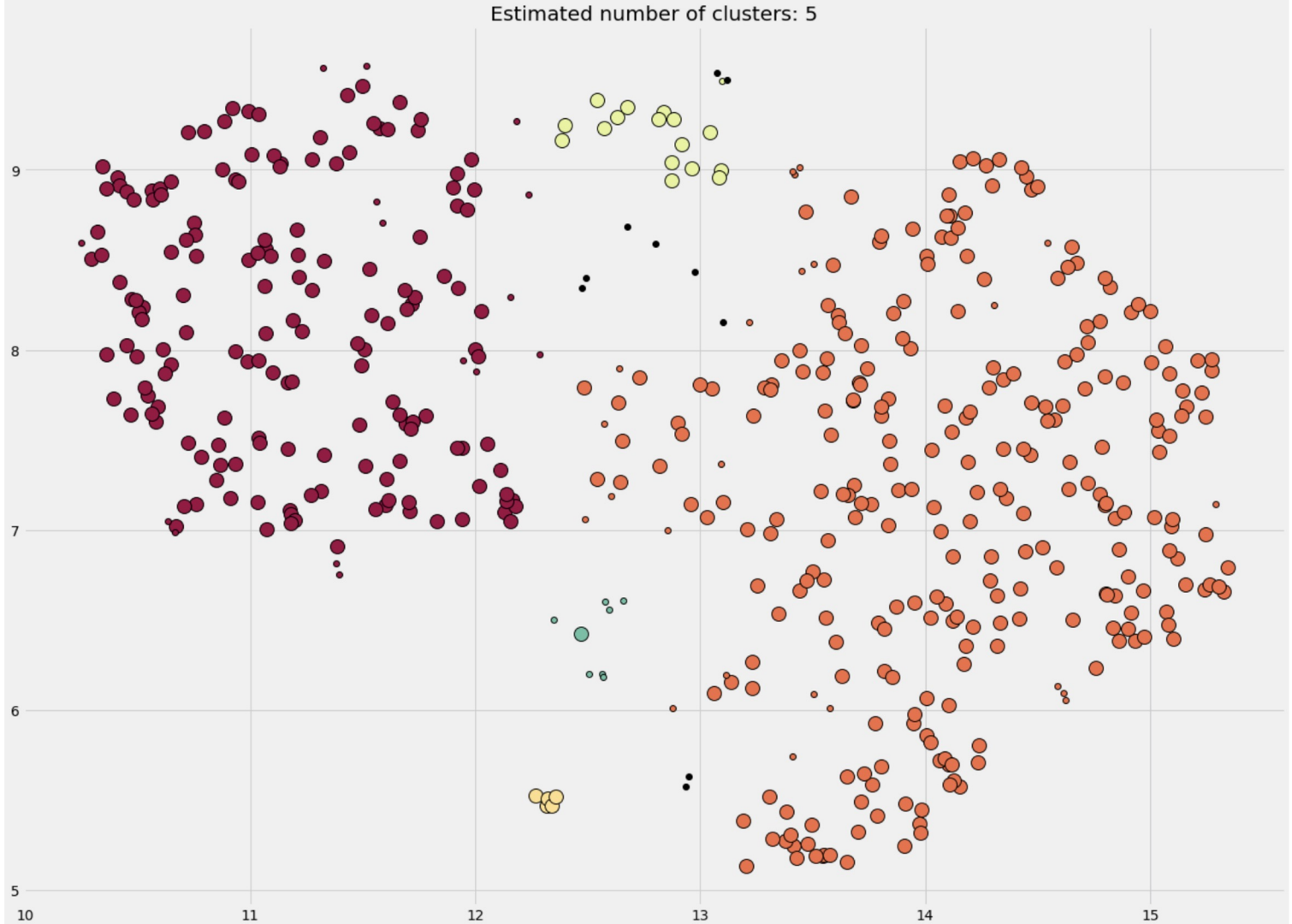
Testing & Evaluation - KMeans



Testing & Evaluation - DBScan



Testing & Evaluation - DBScan



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  - Chapter Summarization Model
  - Information Retrieval

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