

Anime Recommendation System

 by OTAKU OASIS



Introduction

This project focuses on creating a collaborative and content-based recommender system for anime titles. By leveraging historical preferences, we aim to predict user ratings for anime shows.

Meet The Team

- ❖ Sandiso Magwaza – Team Lead
- ❖ Sharon Ramapuputla- Project Manager
- ❖ Siphosethu Rululu- Github Manager
- ❖ Amanda Mokoena – Data Analyst
- ❖ Kgolo Motshegoa - Data Scientist
- ❖ Nkhubalale Nkadimeng- Data Engineer





Data Collection

This dataset contains information on anime content (movies, television series, music, specials, OVA, and ONA*)

1

Data Acquisition

Open source Kaggle dataset

2

Data Source

(<https://www.kaggle.com/datasets/CooperUnion/anime-recommendations-database>)

3

Datasets

Anime.csv, training.csv, test.csv

Preprocessing

The initial step involves gathering data on anime titles and user ratings from various sources like online databases and APIs.

1

Data Inspection

`df.info()`, `df.describe()`, `df.isnull().sum()`, `df.head()`

2

Data Cleaning

Handling missing values, inconsistent data, and outliers.

3

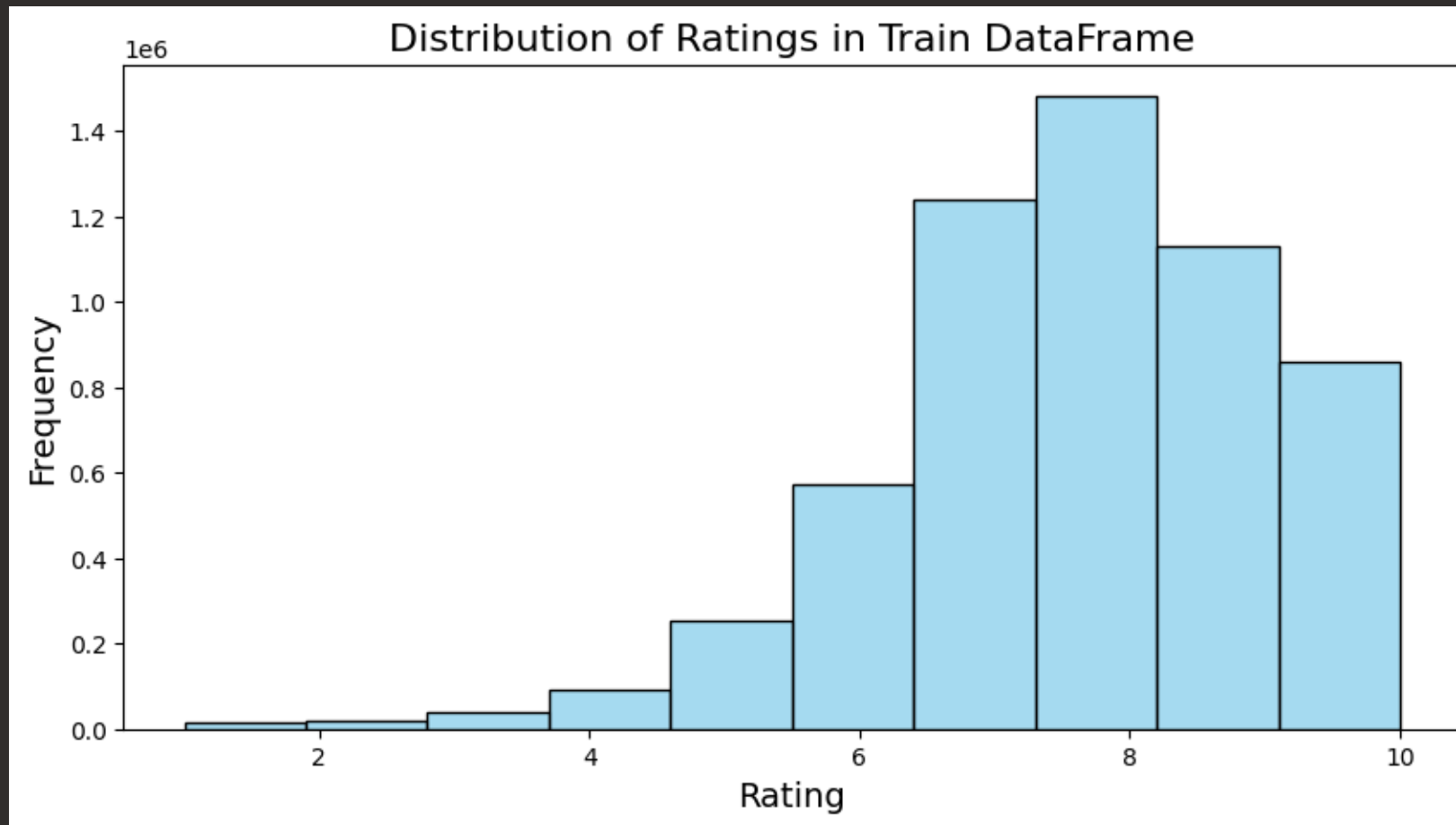
Data Transformation

Normalizing and scaling data for better model performance.

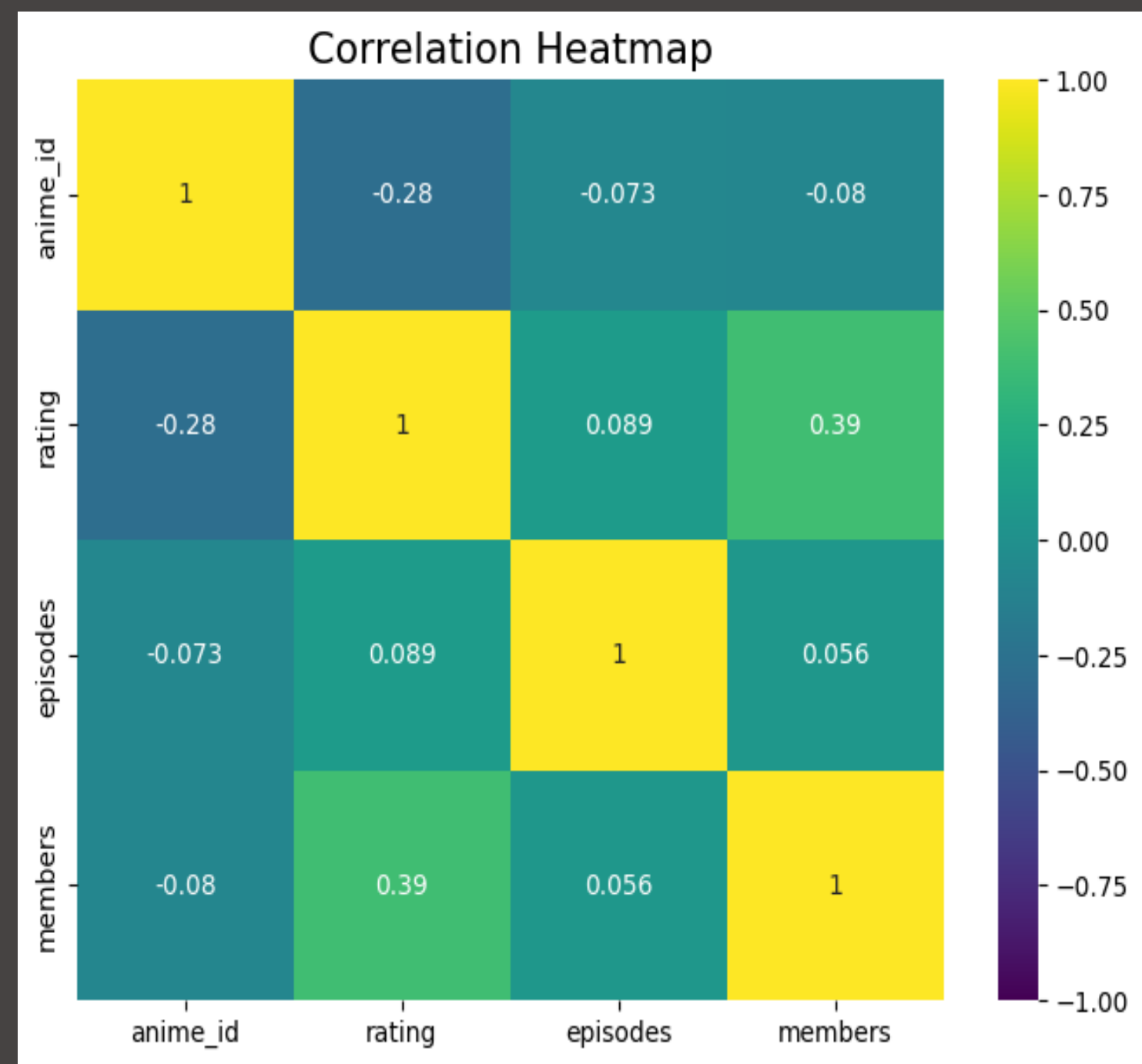
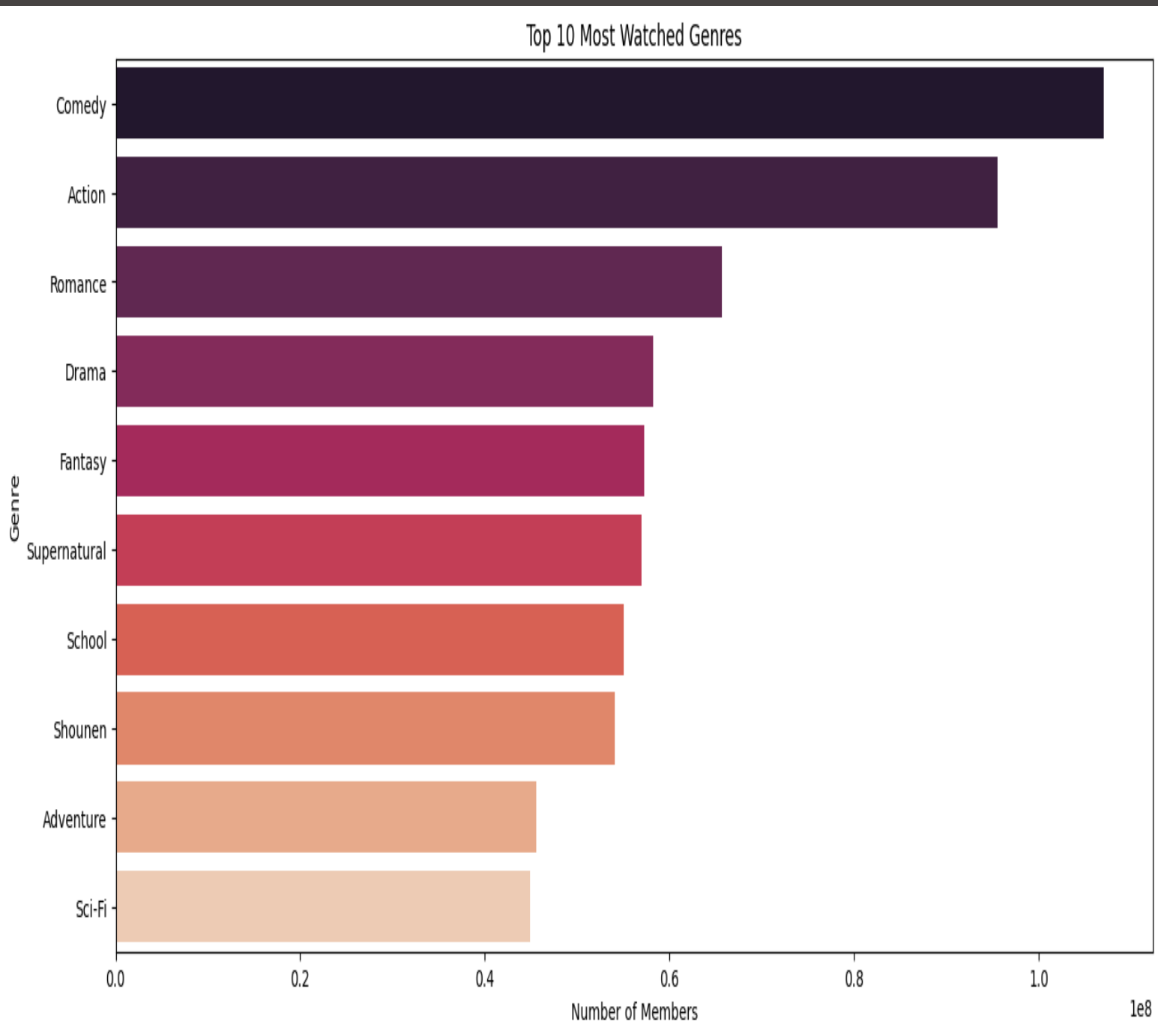


EXPLORATORY DATA ANALYSIS

Exploratory Data Analysis is the process of using visual and statistical methods to understand the underlying structure and patterns in a dataset.



Visualizations: Distribution of ratings and most rated anime. Genre distribution and average ratings. Correlation between ratings and popularity (members).





Feature Engineering

This step focuses on creating relevant features from the collected data and choosing the most suitable machine learning model for predictions.

Dimensionality Reduction

- Principal Component Analysis (PCA)

Normalization and Scaling

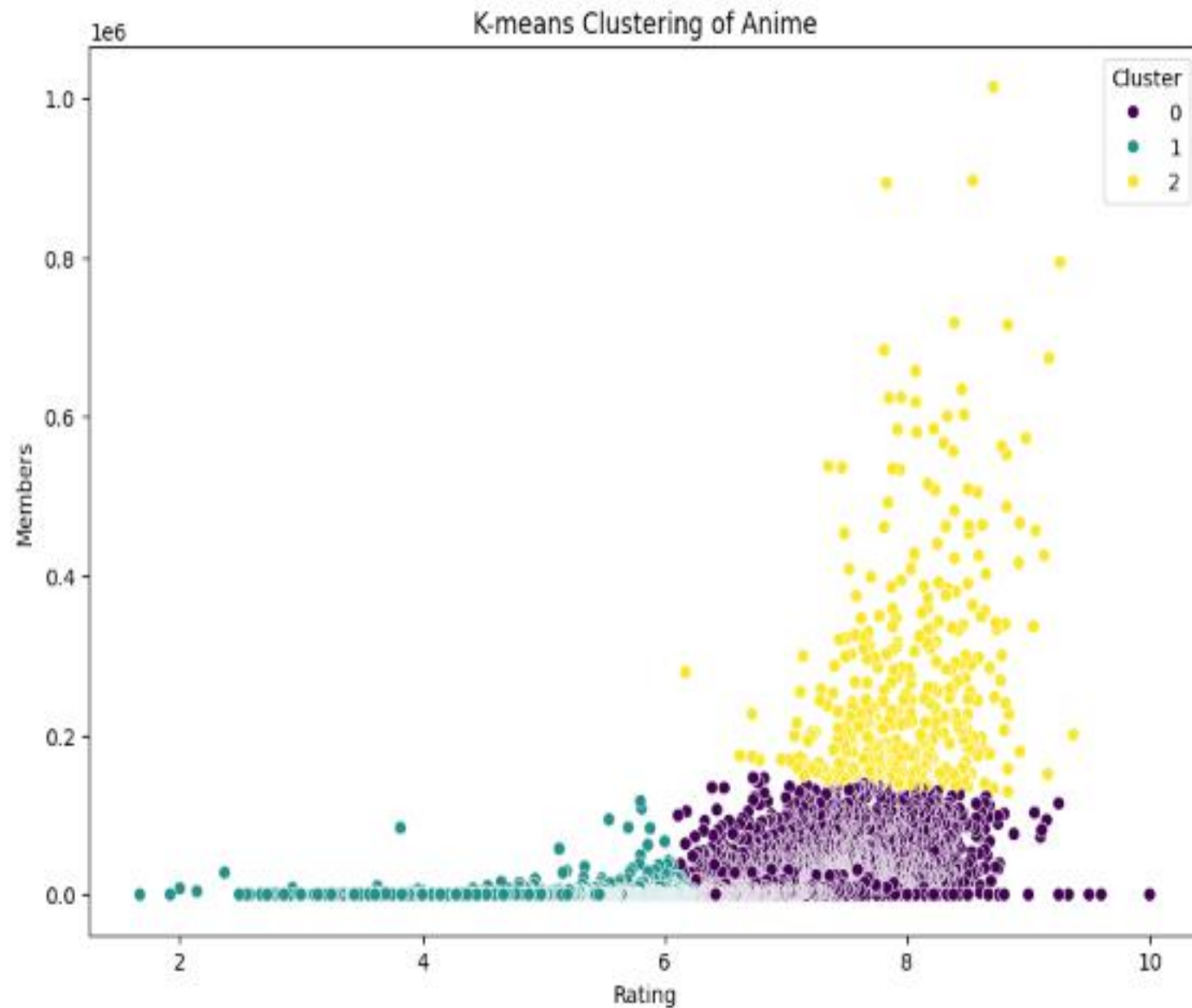
- Min-Max Scaling

Feature Selection Methods

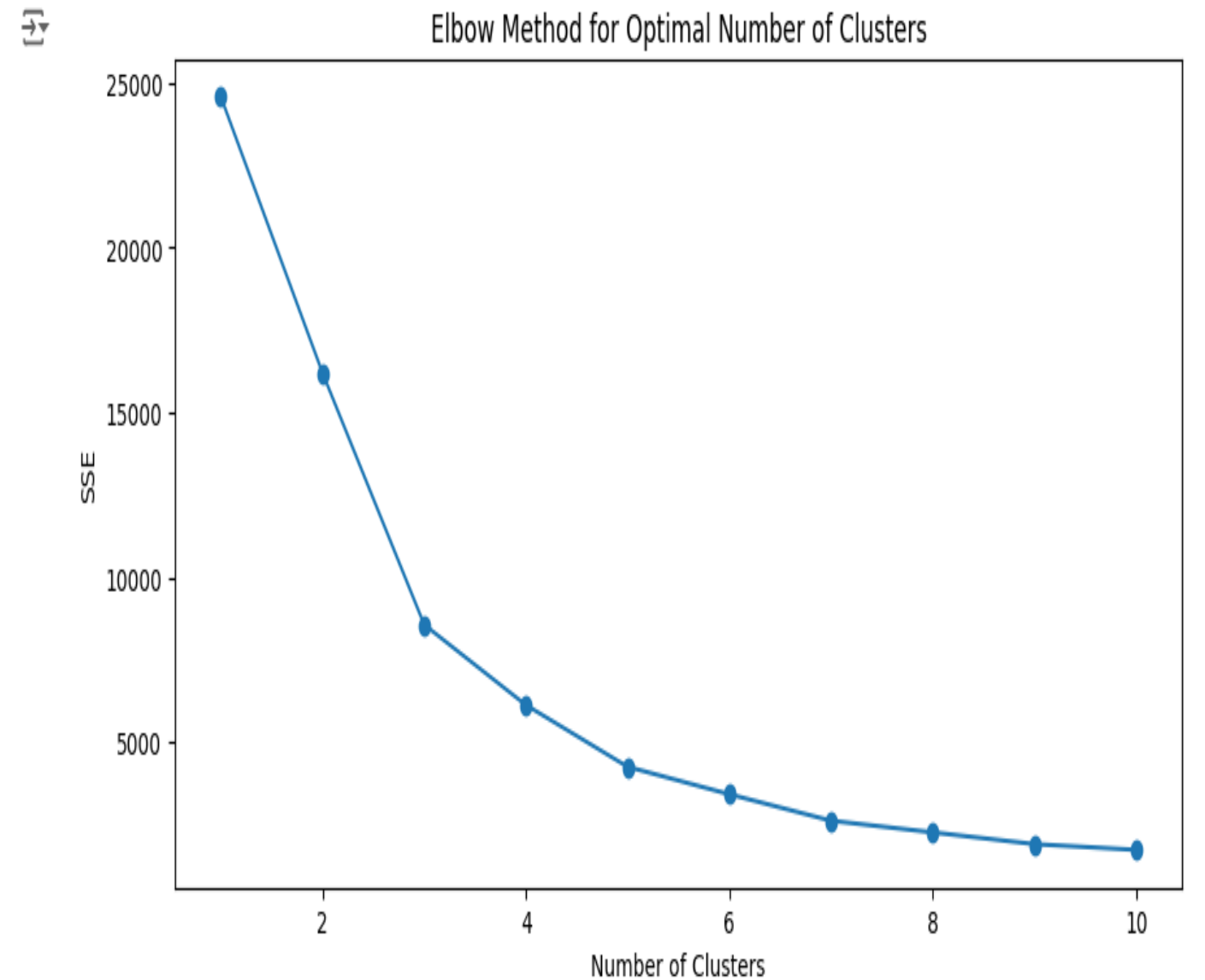
- Variance Threshold, Correlation Matrix

Model Selection

K-Means

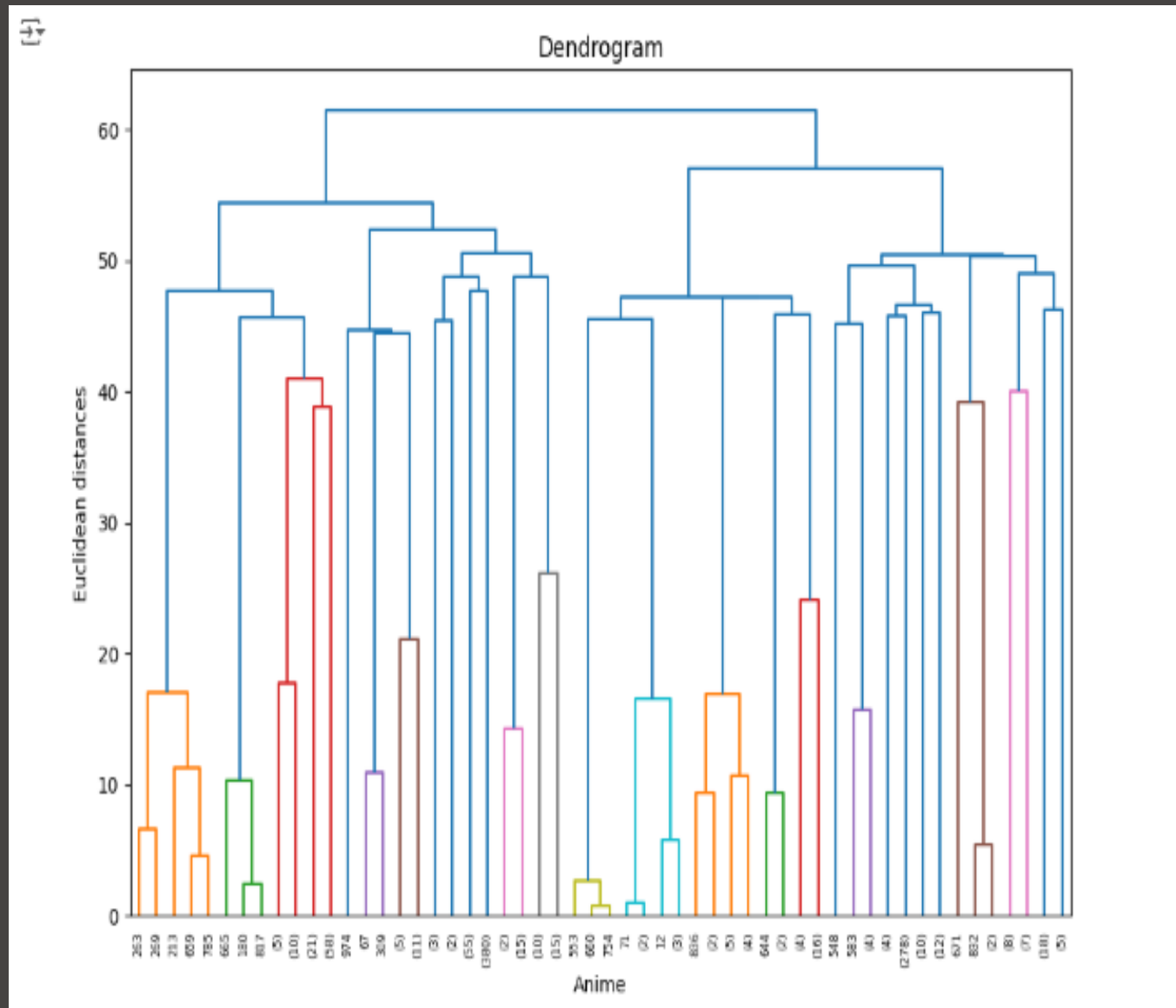


Elbow Method

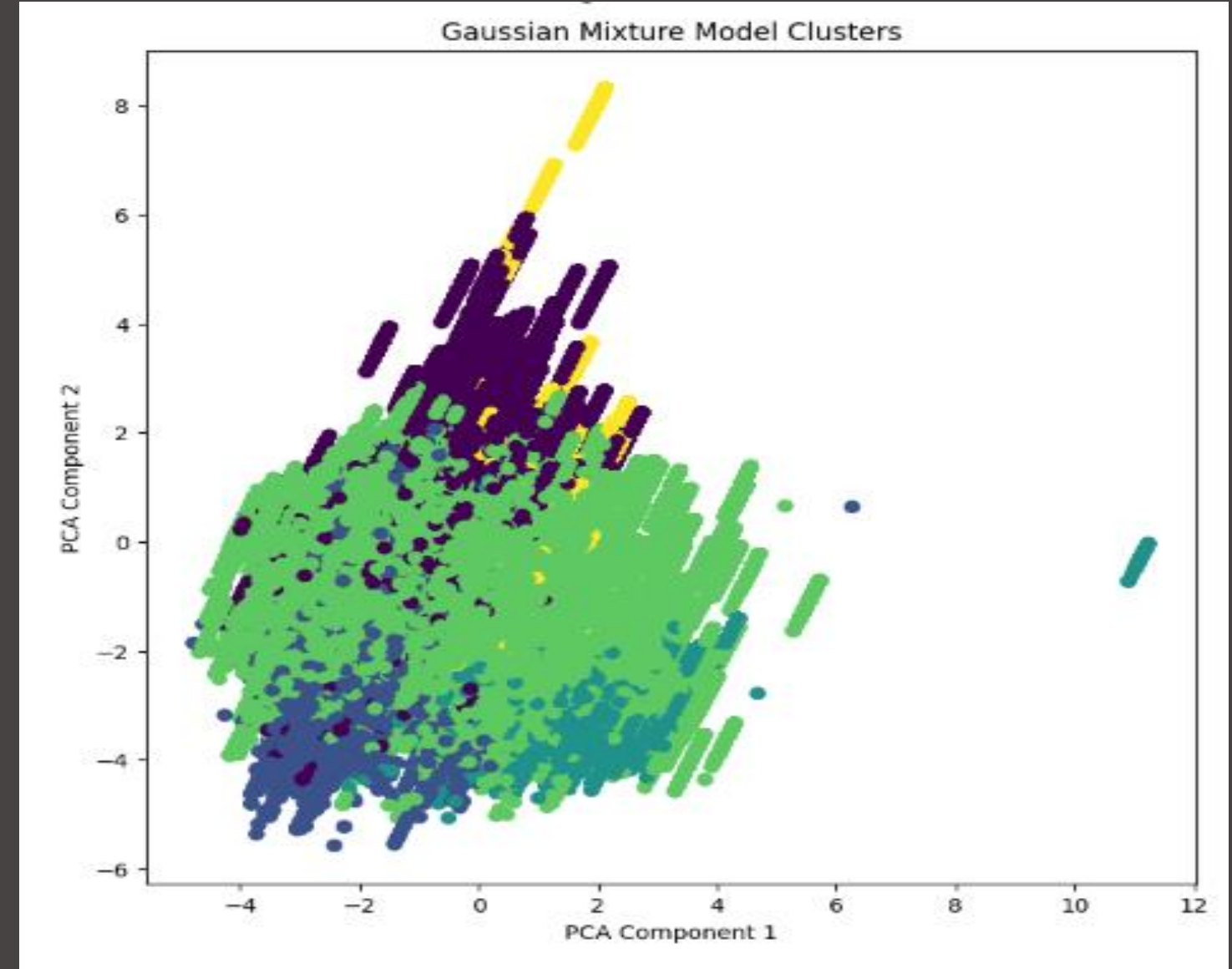


Model Selection

Hierarchical Clustering



Gaussian Mixture Models



Collaborative Filtering Approach

This approach leverages similarities between users' preferences to generate recommendations. It analyzes past ratings and interactions to find users with similar tastes.

1 User-based Filtering

Recommends anime based on the ratings of users with similar tastes.

2 Item-based Filtering

Suggests anime based on the ratings of other users who liked similar titles.



Content-Based Recommendation Techniques

This approach suggests anime based on the characteristics of the current title, analyzing its features, genres, and themes.

Genre Similarity

Recommends anime based on similar genres to the ones the user enjoys.

Character Traits

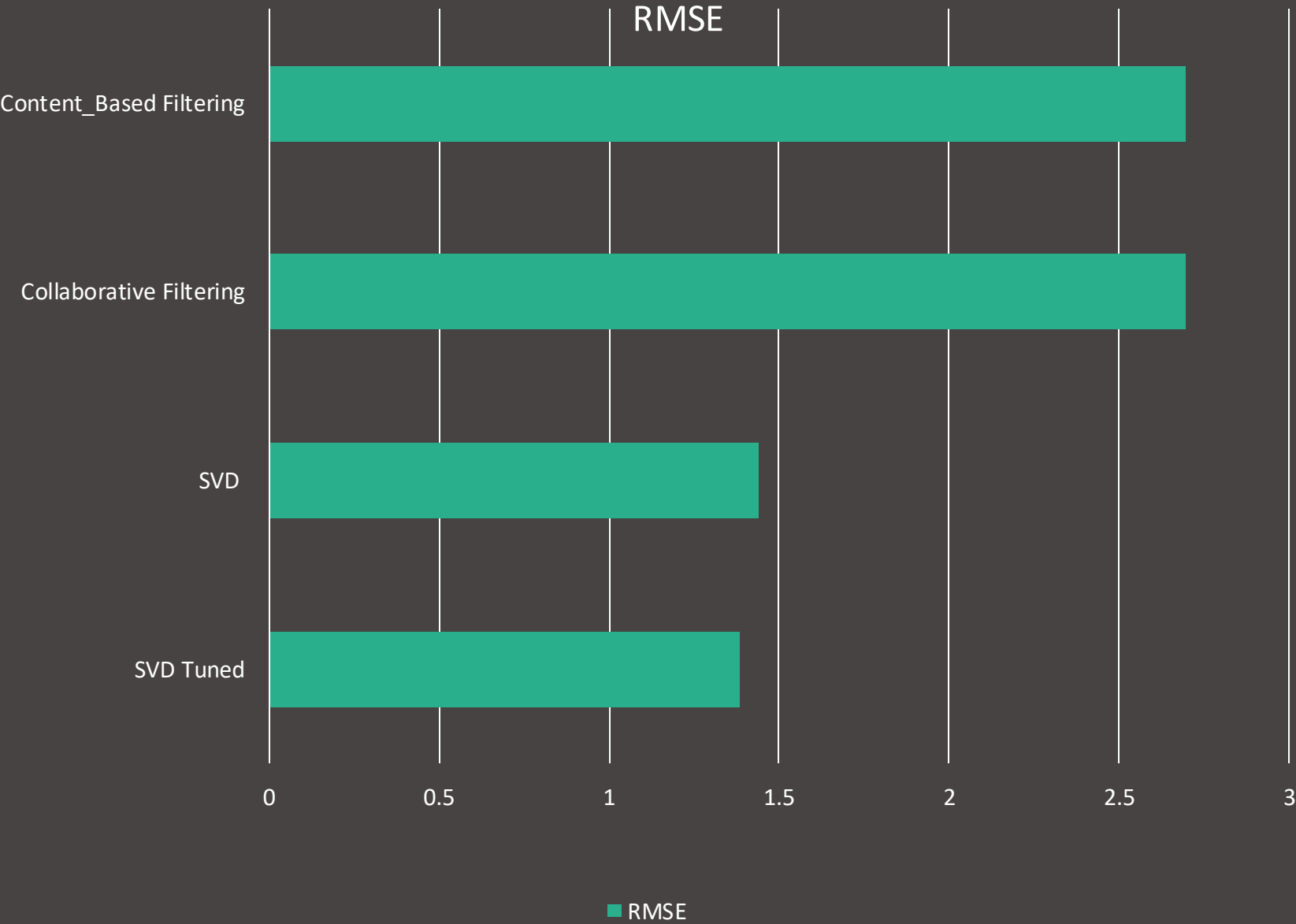
Suggests anime with characters sharing traits with those the user likes.

Themes and Plot

Recommends anime with similar themes and plot elements.

Model Evaluation

Evaluation Metric: Root Mean Squared Error (RMSE)



Model	RMSE
SVD Tuned	1.385
SVD	1.439
Collaborative Filtering	2.698
Content-Based Filtering	2.698

Streamlit: Building Interactive Apps

Streamlit is a Python library that simplifies the process of building interactive web apps for data science projects.

1

User Interface

Creating a user-friendly interface for search, browsing, and personalized recommendations.

2

Data Visualization

Displaying anime details, ratings, and recommendations using interactive charts and graphs.

3

Real-time Predictions

Integrating the trained model to provide recommendations based on user preferences.

<https://nkhubalale-recommendation-system-app-izOvxz.streamlit.app/>



Deployment and User Interface

The developed recommender system is deployed on a web server, making it accessible to users for real-time recommendations.

User Authentication

Allows users to create profiles and save their preferences.

Recommendation Engine

Provides personalized anime suggestions based on user ratings and viewing history.

User Feedback

Enables users to provide feedback on recommendations, improving the system's accuracy.

Conclusion and Future Enhancements

The project successfully developed a collaborative and content-based recommender system for anime titles.



Improved Accuracy

Explore advanced algorithms and techniques for more accurate predictions.



Future plans

Improve recommendations & future upgrades .



Community Integration

Incorporate user reviews and social interactions to enhance the recommendation experience.



Otaku Oasis

