

Unsupervised Learning Project

Anime Recommendation System using Clustering

Prepared for internal presentation.

Project Overview

This project applies unsupervised learning techniques to build a recommendation system for anime titles.

We use genre vectorization, PCA for dimensionality reduction, and KMeans clustering to group users and anime.

The final output includes cluster interpretations and personalized recommendations.

Datasets and Preprocessing

anime.csv: 12294 anime titles with metadata.

train.csv: 5703555 user ratings.

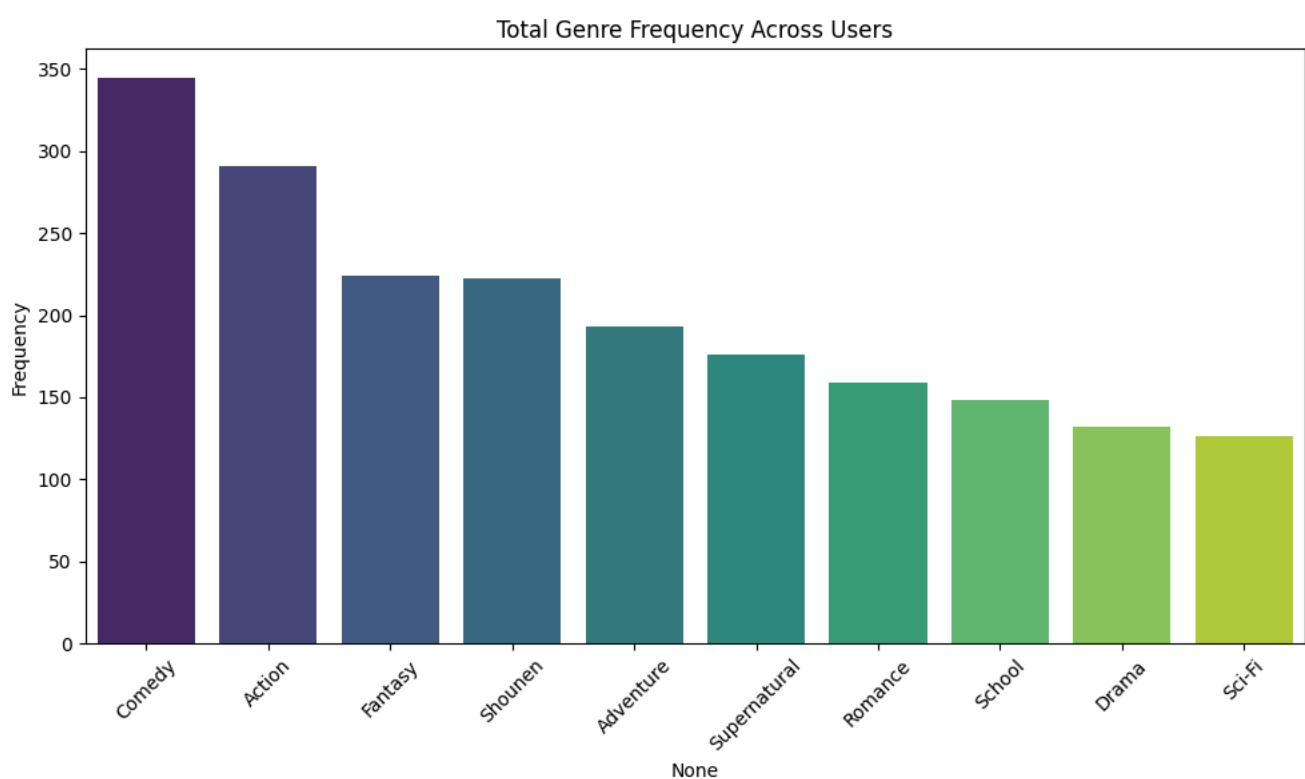
user_genre_profile.csv: 10 user genre profiles.

user_similarity_matrix.csv: 10x10 similarity matrix.

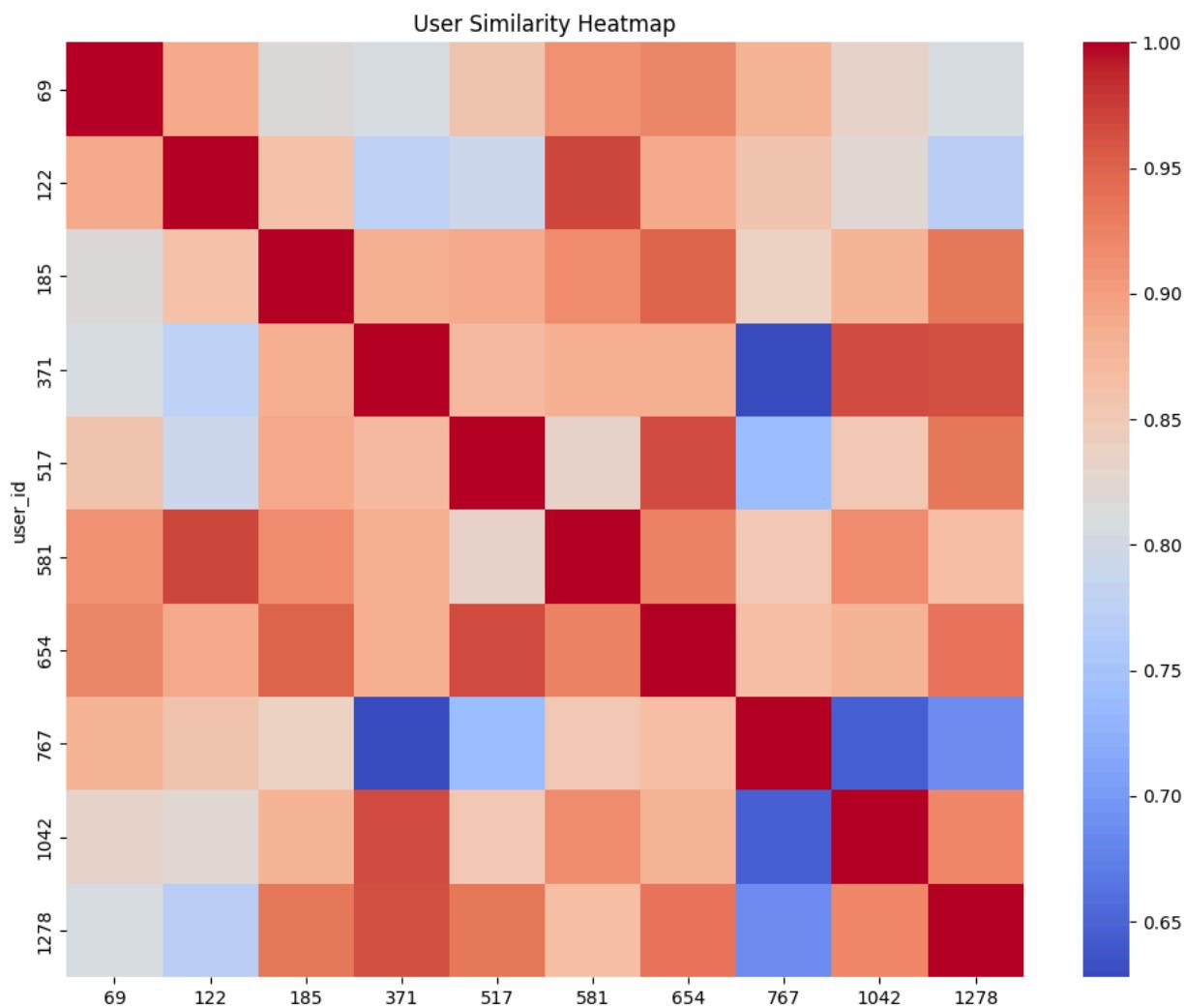
cluster_summary.csv: 5 clusters with dominant genres and types.

user_recommendations.csv and enriched_user_recommendations.csv: personalized recommendations.

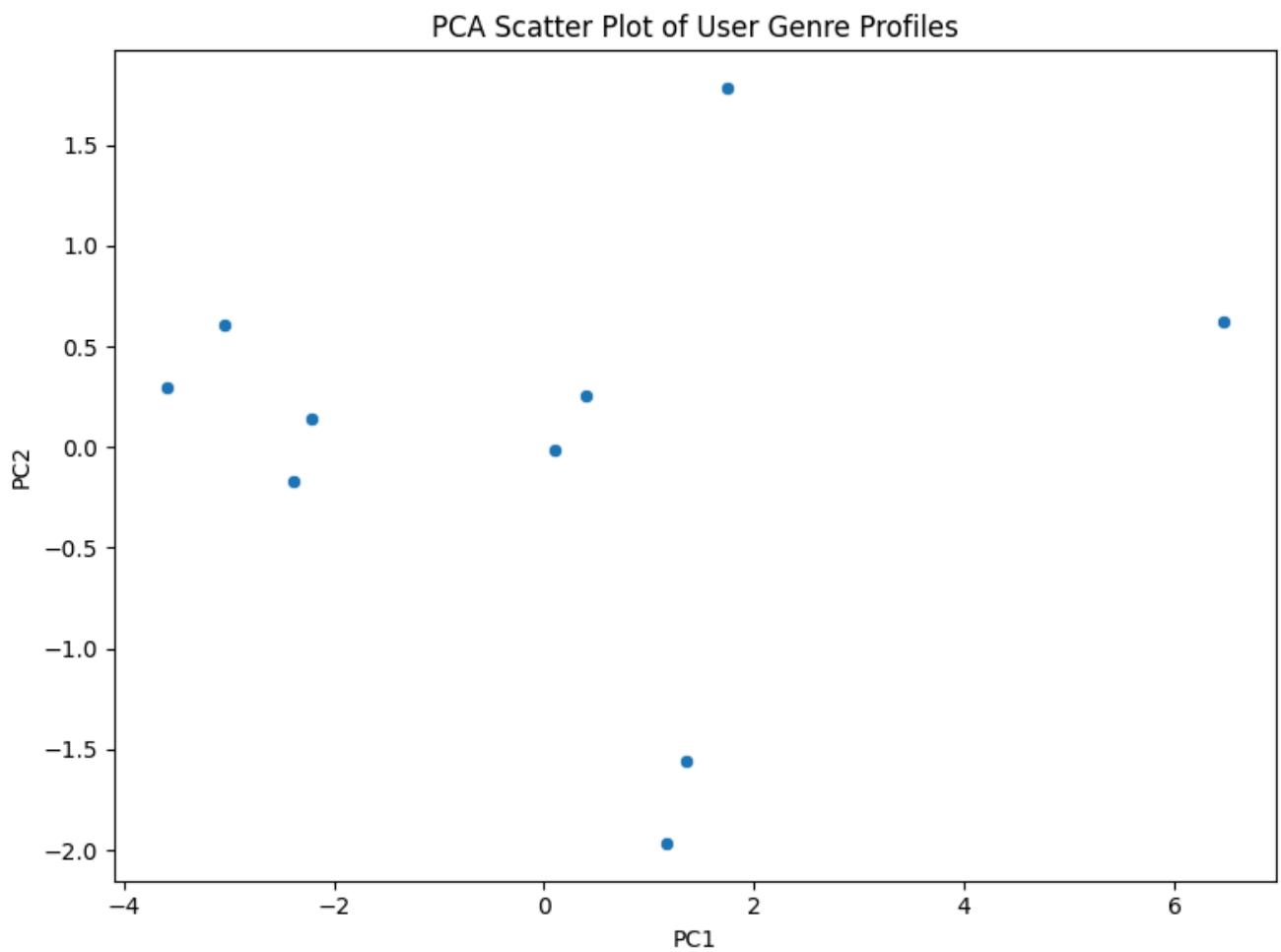
Genre Distribution



User Similarity Heatmap



PCA Scatter Plot



Cluster Summary

Cluster	Dominant Genre	Dominant Type
0	Action, Mecha, Military, School, Sci-Fi, Super Power	TV
1	Comedy, School, Slice of Life	TV
2	Adventure, Drama, Supernatural	Movie
3	Adventure, Comedy, Fantasy, Sci-Fi, Shounen	Movie
4	Mystery, Police, Psychological, Supernatural, Thriller	TV

Top Anime Recommendations

User 69:

- Kimi ni Todoke (Romance, School, Shoujo, Slice of Life)
- Summer Wars (Comedy, Sci-Fi)
- Hajime no Ippo: New Challenger (Comedy, Drama, Shounen, Sports)
- Fullmetal Alchemist: Brotherhood (Action, Adventure, Drama, Fantasy, Magic, Military, Shounen)
- To LOVE-Ru Darkness (Comedy, Ecchi, Harem, Romance, School, Sci-Fi, Shounen)

User 122:

- Fullmetal Alchemist: The Sacred Star of Milos (Action, Adventure, Comedy, Drama, Fantasy, Magic, Military, Shounen)
- Shijou Saikyou no Deshi Kenichi (Action, Comedy, Martial Arts, School, Shounen)
- Danganronpa: Kibou no Gakuen to Zetsubou no Koukousei The Animation (Action, Horror, Mystery, Psychological)
- Suzumiya Haruhi no Yuuutsu (2009) (Comedy, Mystery, Parody, Romance, School, Sci-Fi, Slice of Life)
- Kaze no Tani no Nausicaä (Adventure, Fantasy)

User 185:

- Trigun (Action, Comedy, Sci-Fi)
- Suzumiya Haruhi no Yuuutsu (Comedy, Mystery, Parody, School, Sci-Fi, Slice of Life)
- Shijou Saikyou no Deshi Kenichi (Action, Comedy, Martial Arts, School, Shounen)
- Log Horizon (Action, Adventure, Fantasy, Game, Magic, Shounen)
- Fairy Tail (Action, Adventure, Comedy, Fantasy, Magic, Shounen)

User 371:

- Dragon Ball: Super Saiya-jin Zetsumetsu Keikaku (Adventure, Fantasy, Martial Arts, Sci-Fi, Shounen, Super Power)
- Mobile Suit Gundam 00 (Action, Drama, Mecha, Military, Sci-Fi, Space)
- Dragon Ball Z Movie 10: Kiken na Futari! Super Senshi wa Nemurenai (Action, Adventure, Comedy, Demons, Fantasy, Martial Arts, Shounen, Super Power)
- Dragon Ball: Ossu! Kaettekita Son Gokuu to Nakama-tachi!! (Action, Adventure, Comedy, Fantasy)
- Guilty Crown (Action, Drama, Sci-Fi, Super Power)

User 517:

- Hajime no Ippo: New Challenger (Comedy, Drama, Shounen, Sports)
- Log Horizon (Action, Adventure, Fantasy, Game, Magic, Shounen)
- Hakuouki Hekketsuroku (Action, Drama, Historical, Josei, Samurai, Supernatural)
- Kimi ni Todoke (Romance, School, Shoujo, Slice of Life)
- Kuroko no Basket (Comedy, School, Shounen, Sports)

Project Links

Trello Board: <https://trello.com/b/your-board-id>

GitHub Repo: <https://github.com/your-username/Unsupervised-Learning-Project-20250901>