GROUP 5:Recommendation System Project

Enhancing User Experience through Personalized Recommendations

Presented by: Group 5

PROJECT OVERVIEW

Digital age brings vast product choices, leading to consumer overwhelm.

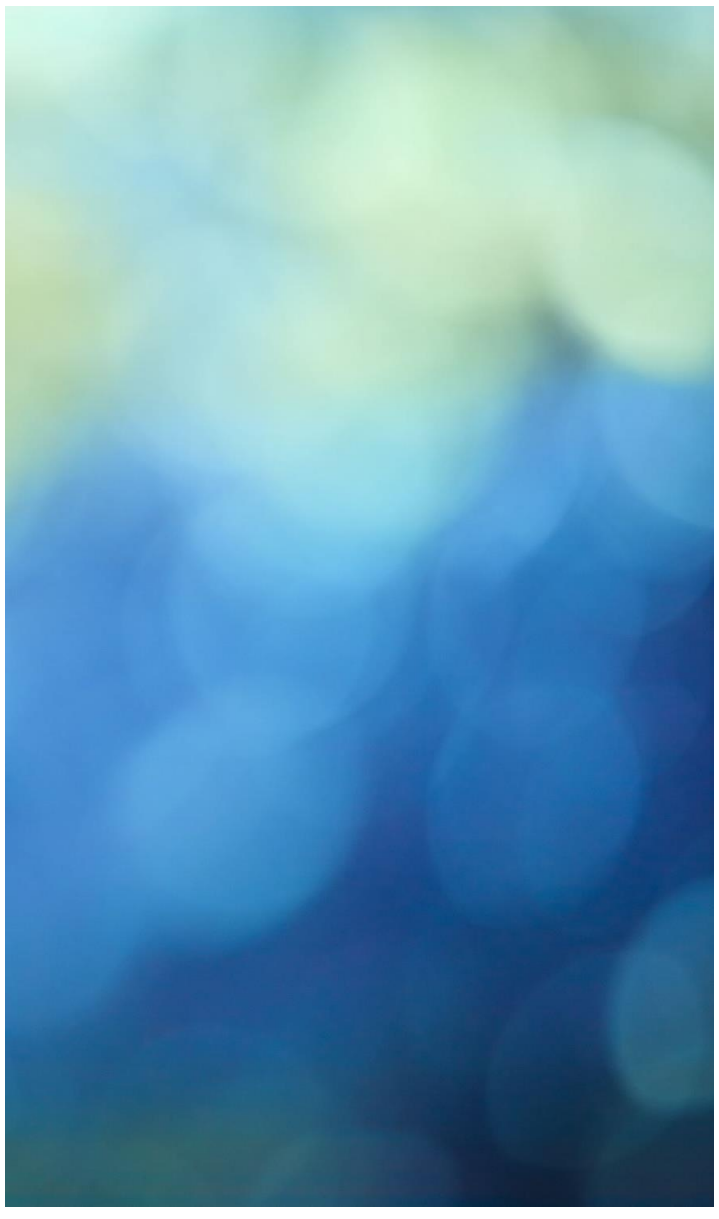
Growth in our product catalog has made navigation challenging for many customers.

Aim: Enhance user experience by aligning product suggestions with user preferences.

Implementing a recommendation system to provide tailored product suggestions.

Goal: Seamless product discovery, higher sales, and increased customer satisfaction.

Metrics of Success



Our Key metric of success is to reduce:

RMSE &

MAE

Business Understanding

Our customers often face difficulty in navigating our extensive product catalog to find items that match their preferences.

To overcome this challenge, we aim to implement a recommendation system that provides tailored product suggestions that align with individual preferences and interests.

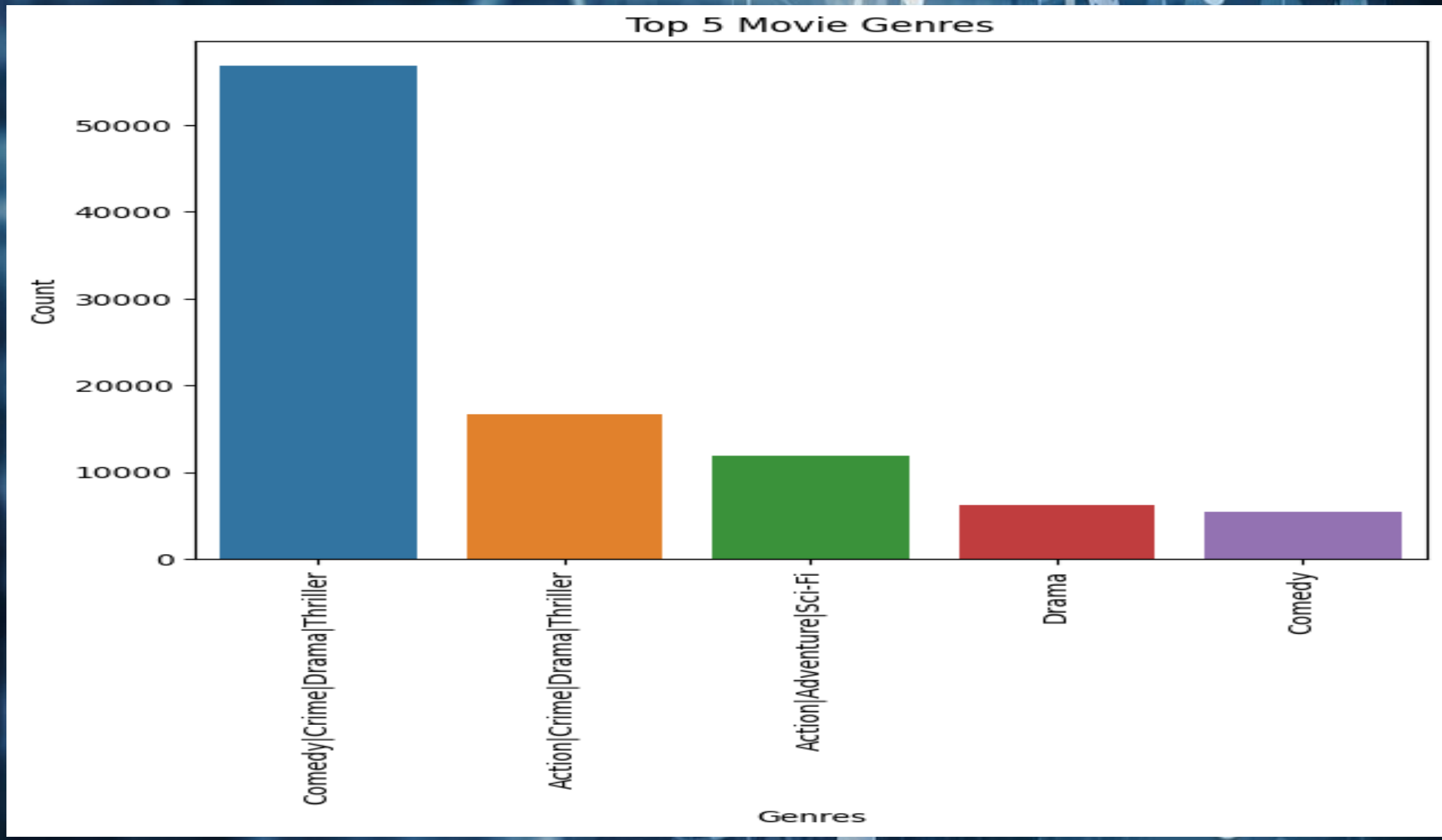
The goal is to increase user engagement, improve conversion rates, boost customer satisfaction and drive revenue growth and bolster our market position.

DATA UNDERSTANDING

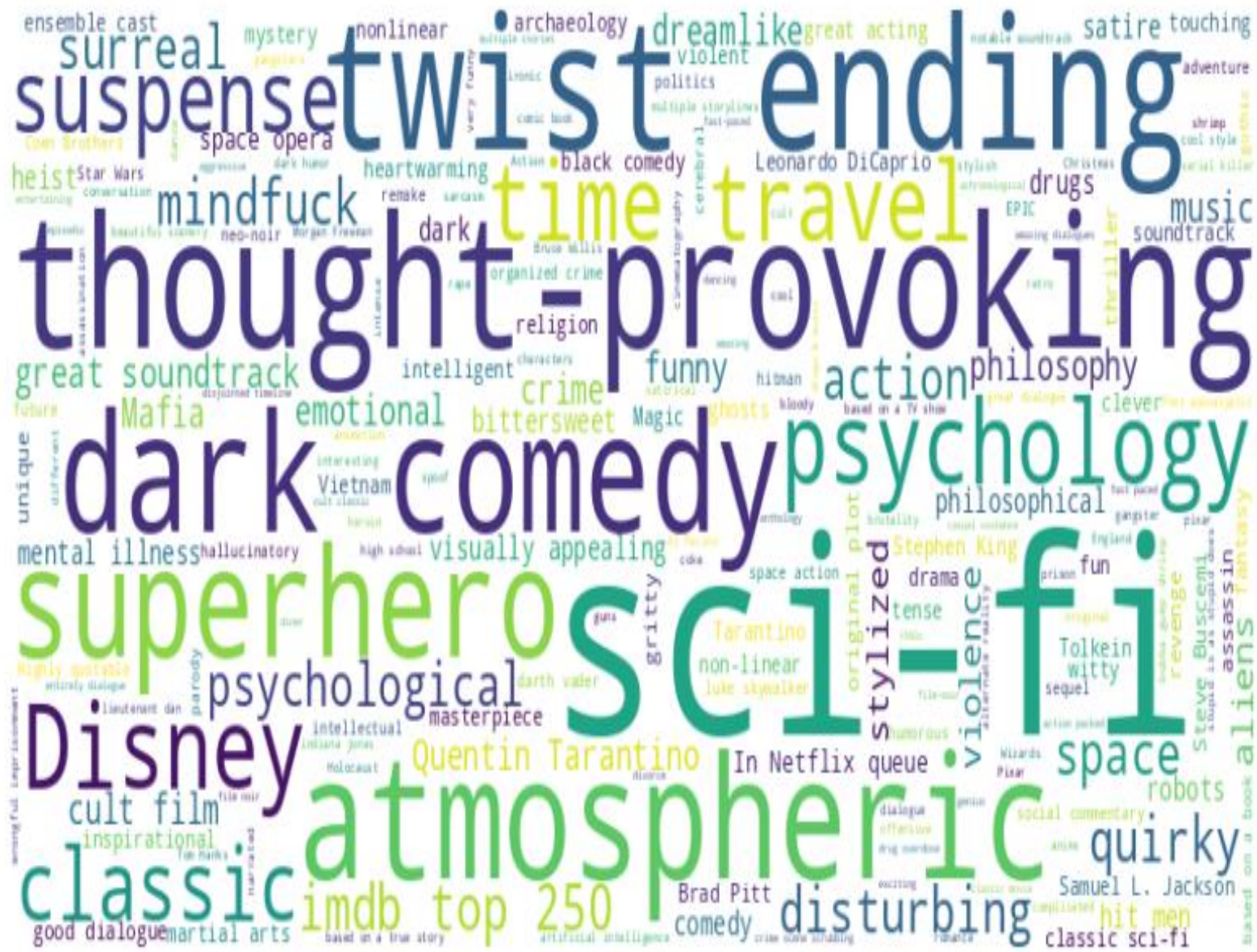
- **Utilized the MovieLens dataset from the University of Minnesota, comprising 'movies', 'ratings', 'tags', and 'links' CSV files.**
- **Diverse data types present, with no duplicated rows.**
- **Comprehensive statistical analysis on ratings revealed:**
- **Average movie rating: 3.97**
- **50% of ratings fall below 4, with a spread of 0.96 around the mean.**

EDA

- **Most popular genres**

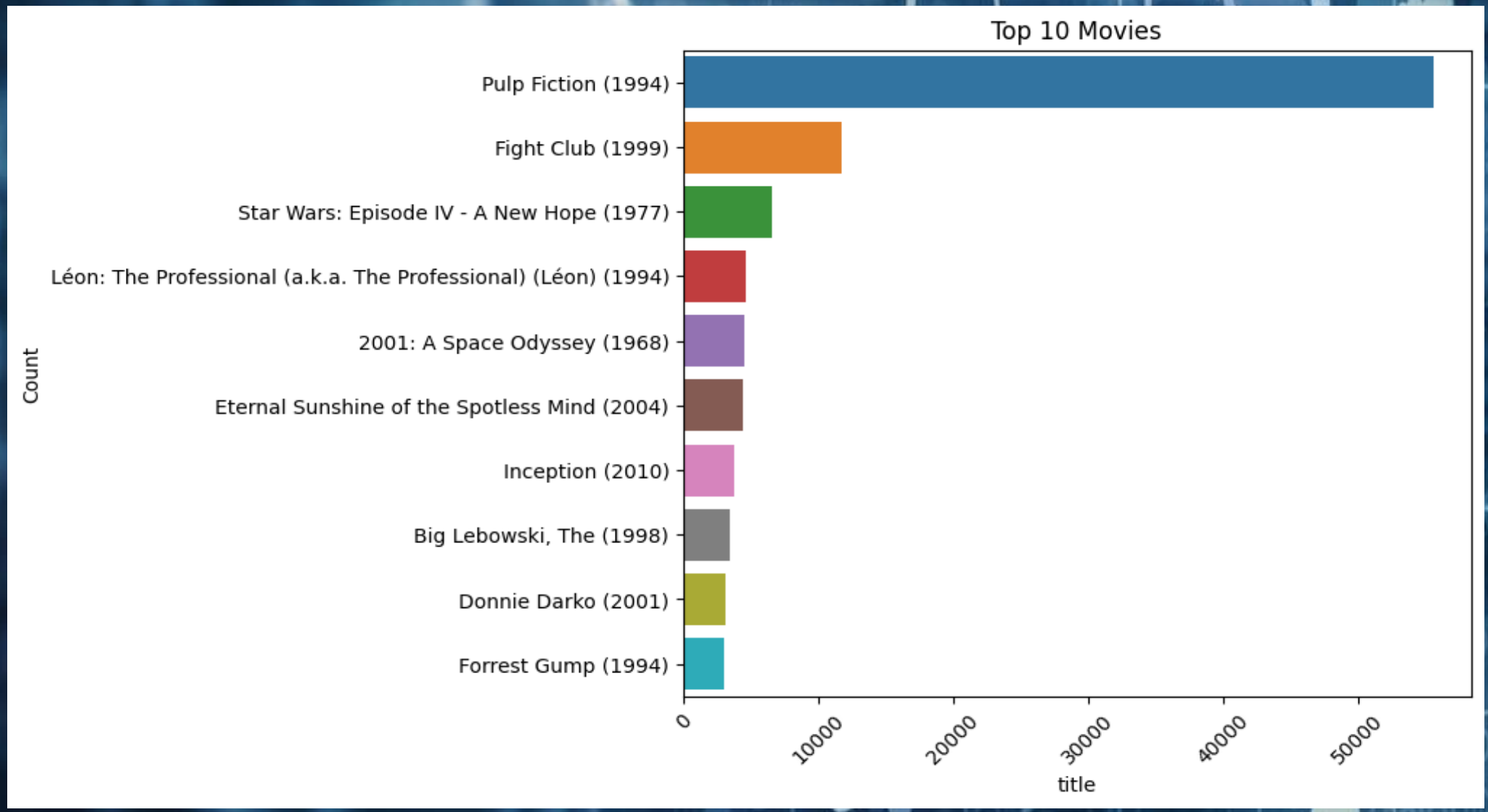


Most Popular Movie Tags



EDA-CONT…

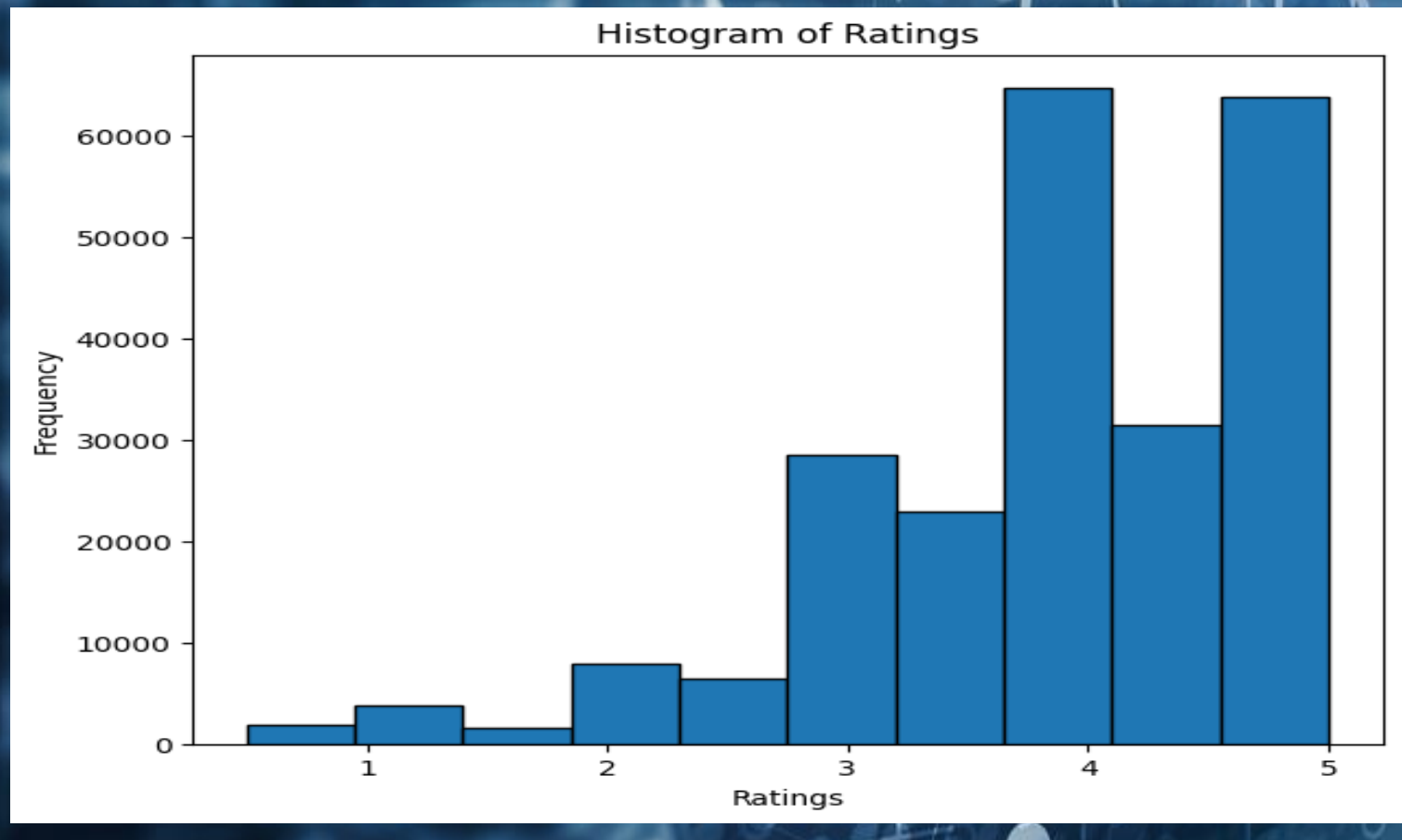
- **Most popular Movies**



EDA FINAL

Distribution of Ratings:

- Most movies have received ratings between 3.5 and 5
- Fewer movies received ratings below 3.



MODELLING: BASELINE(VANILLA MODELS)

BASELINE(VANILLA MODEL)

KNNBaseline

RMSE = **0.88**
MAE= **0.67**

SVD

RMSE = 0.88
MAE = 0.68

KNNWMeans

RMSE = 0.90
MAE = 0.69

KNNBasic

RMSE= 0.91
MAE =0.70

HYPERPARAMETER TUNED MODELLING

Grid search

KNNBAseline

RMSE = **0.89**
MAE= **0.68**

Most improved Model SVD

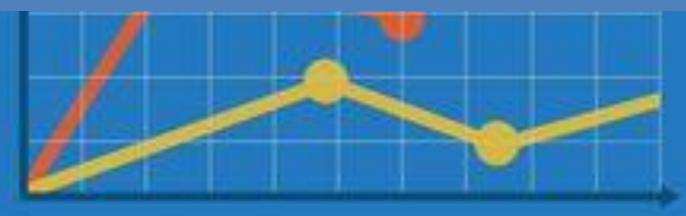
RMSE = 0.85
MAE = 0.65

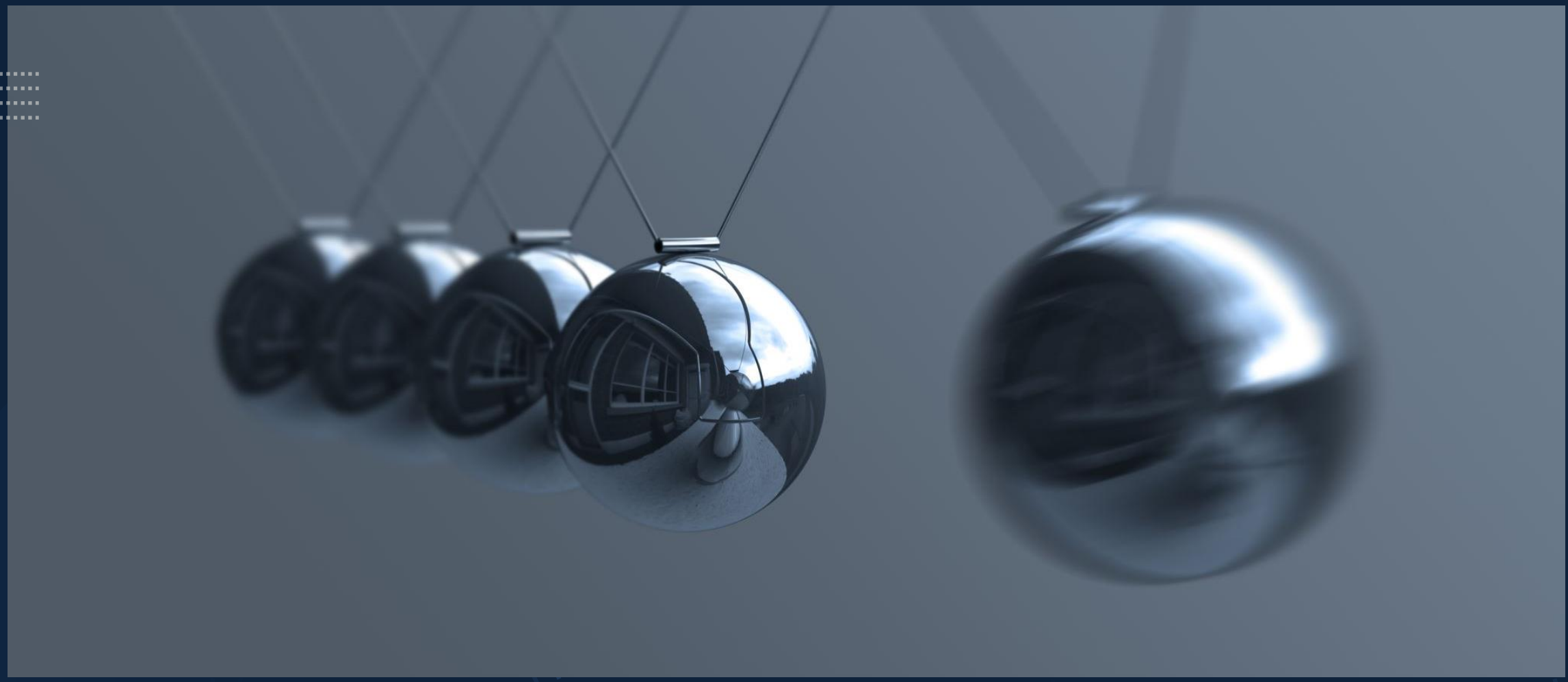
KNNWMeans

RMSE = 0.86
MAE = 0.66

KNNBasic

RMSE= 0.99
MAE =0.76



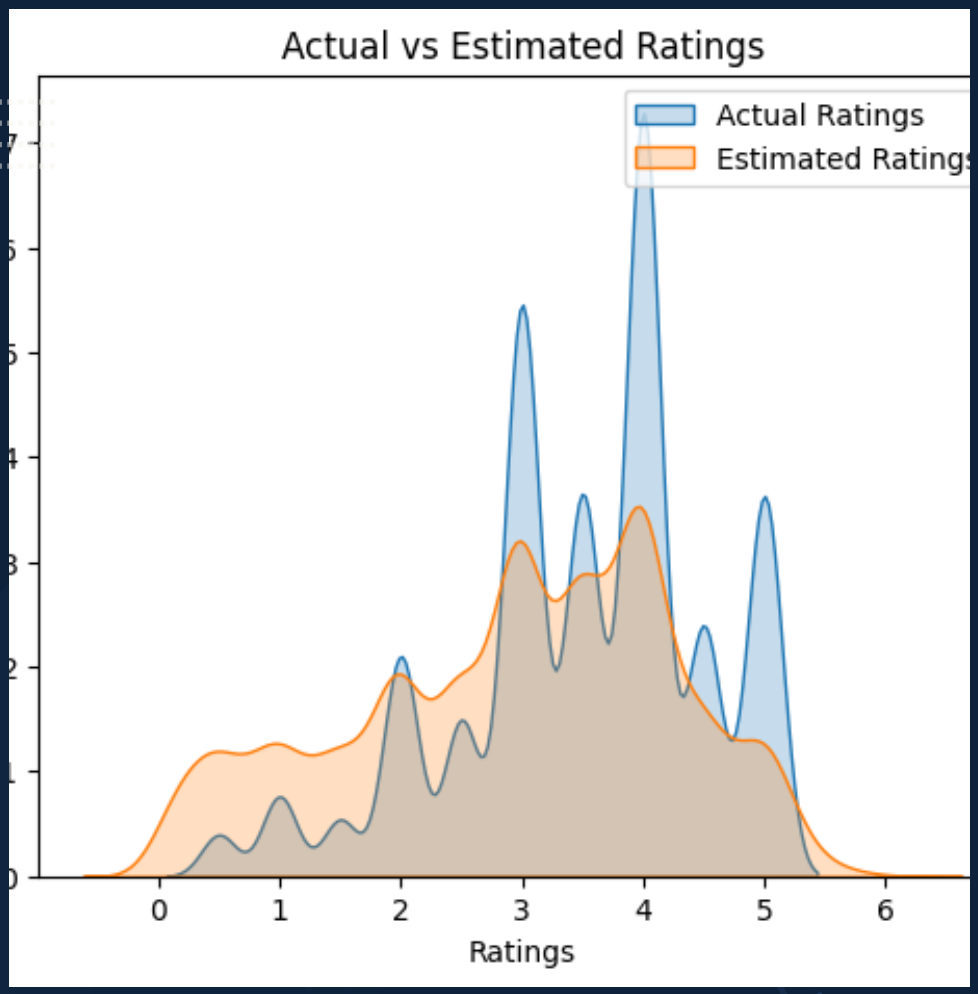


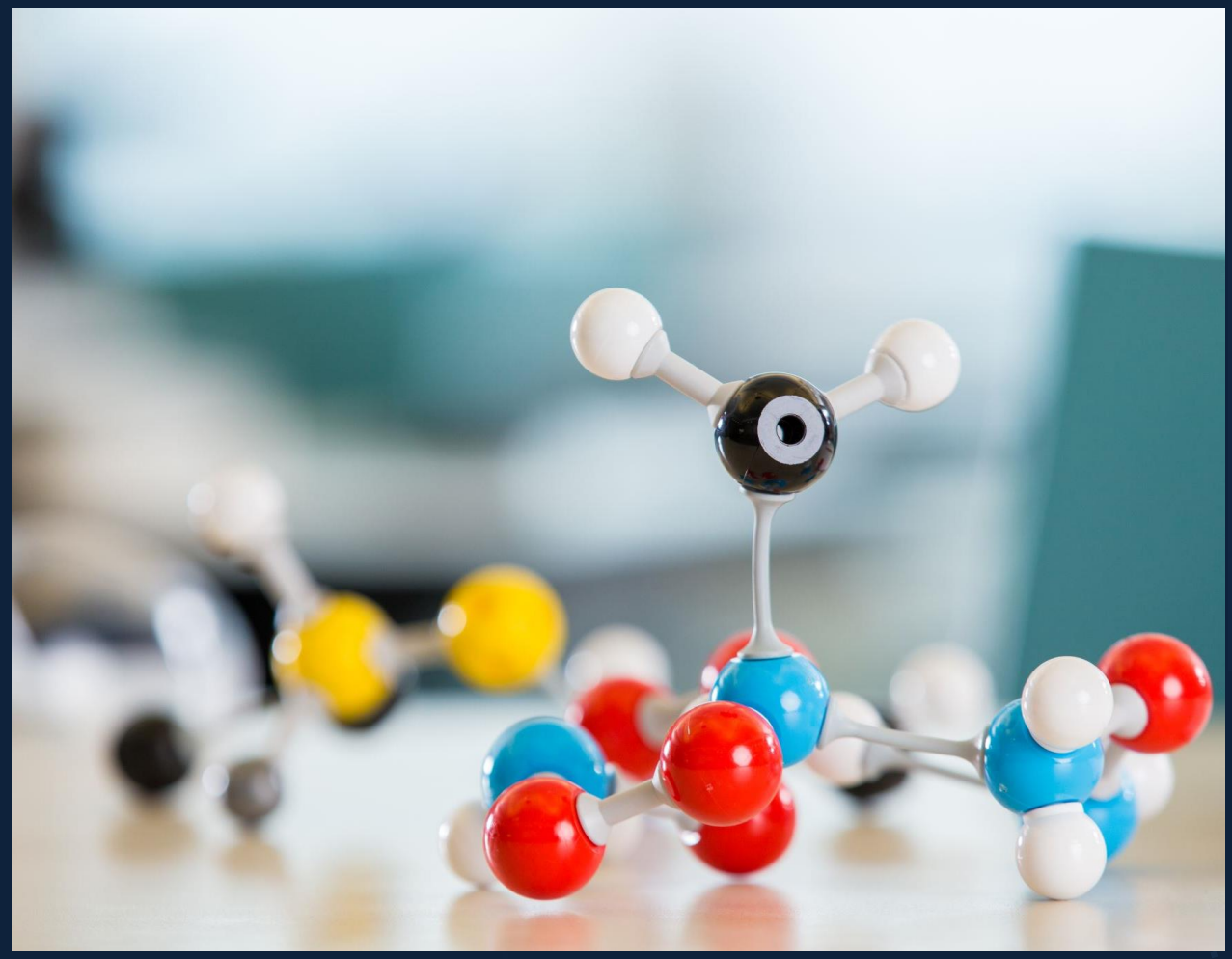
Other Models

HYBRID-MODEL RMSE of 3.23

Truncated SVD RMSE of 0.29

- **It was interesting that hybrid model had the highest RMSE**
- **Truncated SVD was impressive.**





Model Deployment

- **Deployment RMSE = 1.16**

Conclusion

Our quest to build an optimal recommendation model started with the Vanilla KNNBaseline baseline, yielding an initial RMSE of 0.88

Hybrid model combining content-based cosine similarity and collaborative SVD gave RMSE of3.21

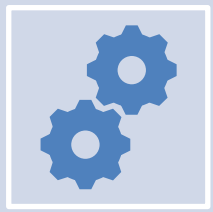
The truncated SVD model stood out, achieving an impressive RMSE of **0.29**, showcasing its potential.

When applied to unseen data, our model achieved a reasonable RMSE of 1.16, with opportunities for further enhancement.

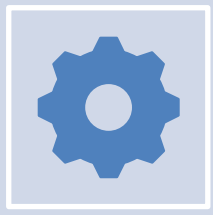
Recommendations

1. Consider expanding hyperparameter search using
2. Evaluate the model using a variety of metrics like precision, recall, MAP, and NCGD
3. Experiment with different weight combinations for content-based and collaborative predictions in the hybrid model to optimize recommendation accuracy.
4. Continuously monitor and retrain the deployed model with new data to ensure consistent predictive quality in real-world scenarios.

Next Steps



Enhance the recommendation system by implementing comprehensive model selection.



Optimize the Hybrid model.

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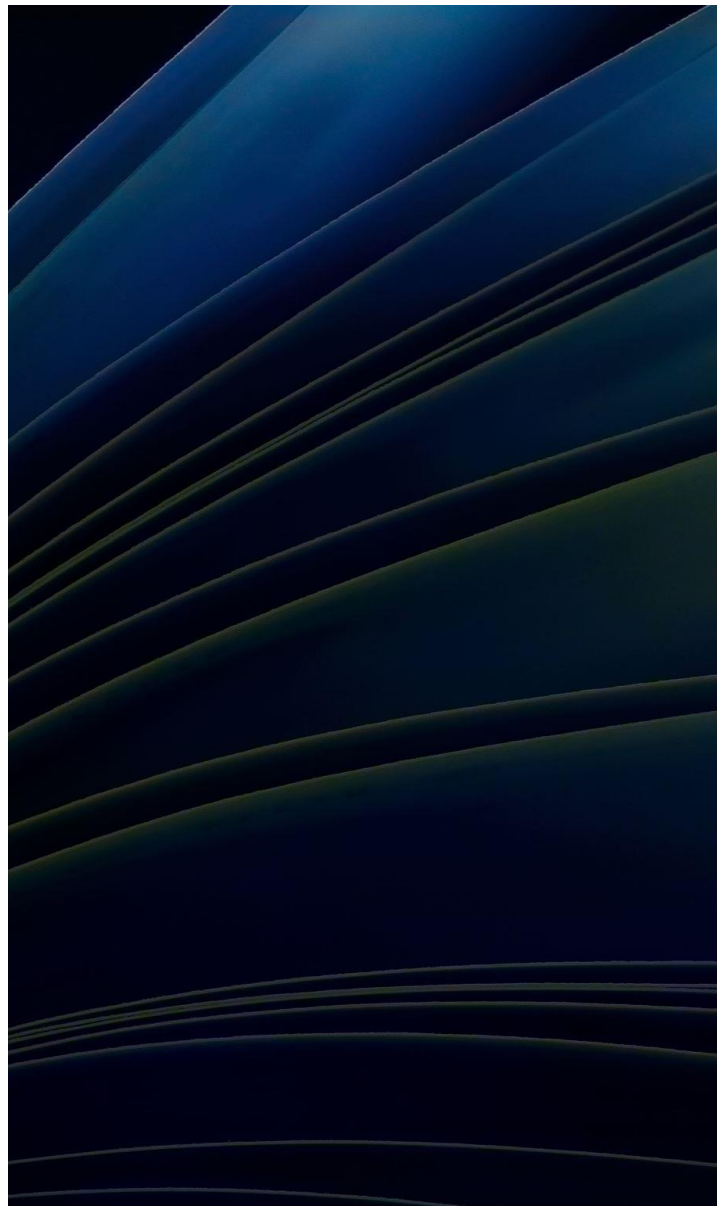

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Questions