Building a Personalized Movie Recommendation System

A Collaborative Filtering Approach

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OVERVIEW

- FlickFlare offers a wide range of films, from classic cinema to indie gems and the latest blockbusters.
- The new recommender system improves user satisfaction by providing movie suggestions that align with individual interests.
- Leverages user ratings to recommend the top 5 movies tailored to each user's tastes.

BUSINESS PROBLEM

Main Objective: To build a movie recommender system that suggests top movies to streaming users based on movie ratings

Business Problem: Users reported dissatisfaction with movie recommendations not matching their interests.

DATA UNDERSTANDING

Dataset Overview

- **Source:** MovieLens dataset
- **Key Components:**
  - **movieId:** Unique identifier for each movie.
  - **title:** Title of the movie.
  - **genres:** Genres associated with the movie (e.g., Comedy, Drama, Action).
  - **userId:** Unique identifier for each user.
  - **rating:** Rating given by the user to a movie.
  - **timestamp:** Time when the rating was given.

SAMPLE DATA

Tags DataFrame:

	userId	movieId	tag	timestamp
0	2	60756	funny	1445714994
1	2	60756	Highly quotable	1445714996
2	2	60756	will ferrell	1445714992
3	2	89774	Boxing story	1445715207
4	2	89774	MMA	1445715200

Movies DataFrame:

	movieId	title	genres
0	1	Toy Story (1995)	Adventure|Animation|Children|Comedy|Fantasy
1	2	Jumanji (1995)	Adventure|Children|Fantasy
2	3	Grumpier Old Men (1995)	Comedy|Romance
3	4	Waiting to Exhale (1995)	Comedy|Drama|Romance
4	5	Father of the Bride Part II (1995)	Comedy

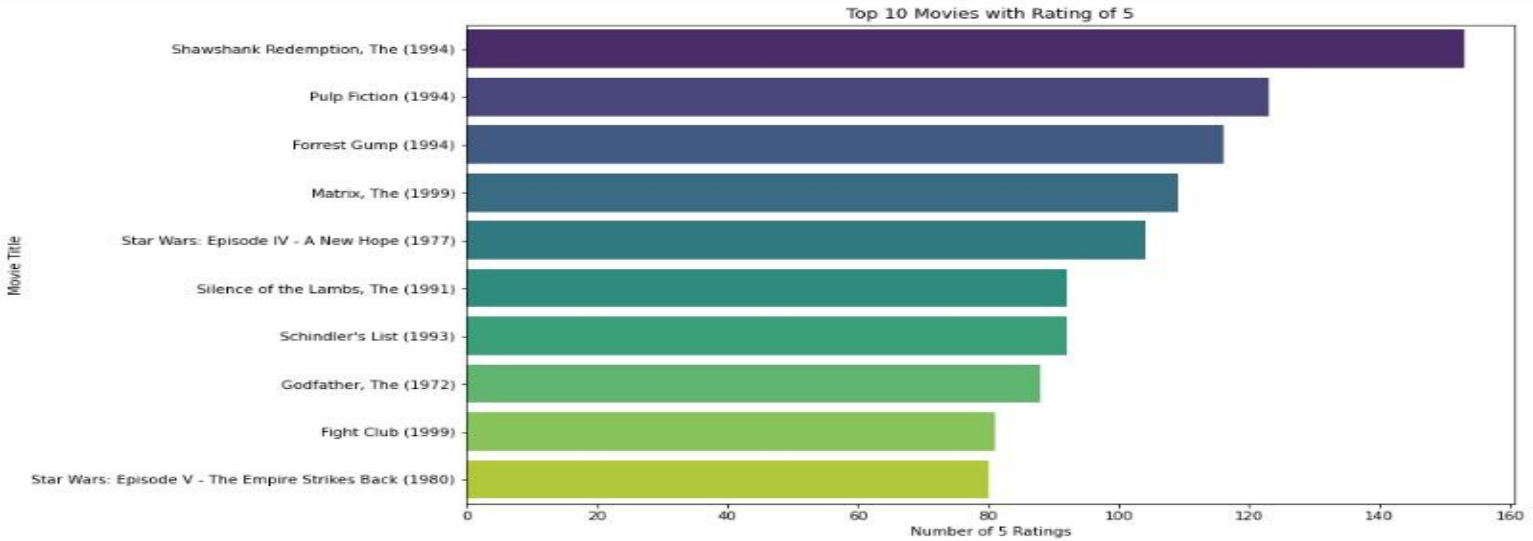
Ratings DataFrame:

	userId	movieId	rating	timestamp
0	1	1	4.0	964982703
1	1	3	4.0	964981247
2	1	6	4.0	964982224
3	1	47	5.0	964983815
4	1	50	5.0	964982931

Links DataFrame:

	movieId	imdbId	tmdbId
0	1	114709	862.0
1	2	113497	8844.0
2	3	113228	15602.0
3	4	114885	31357.0
4	5	113041	11862.0

OBSERVATION AND RESULTS



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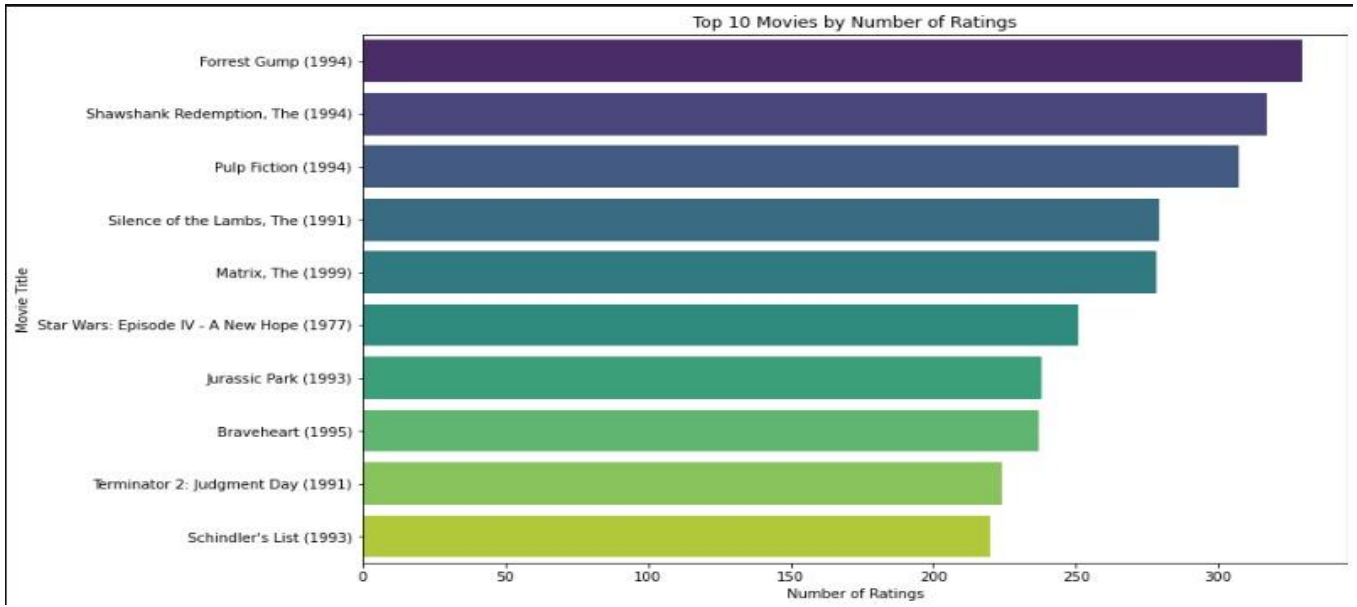
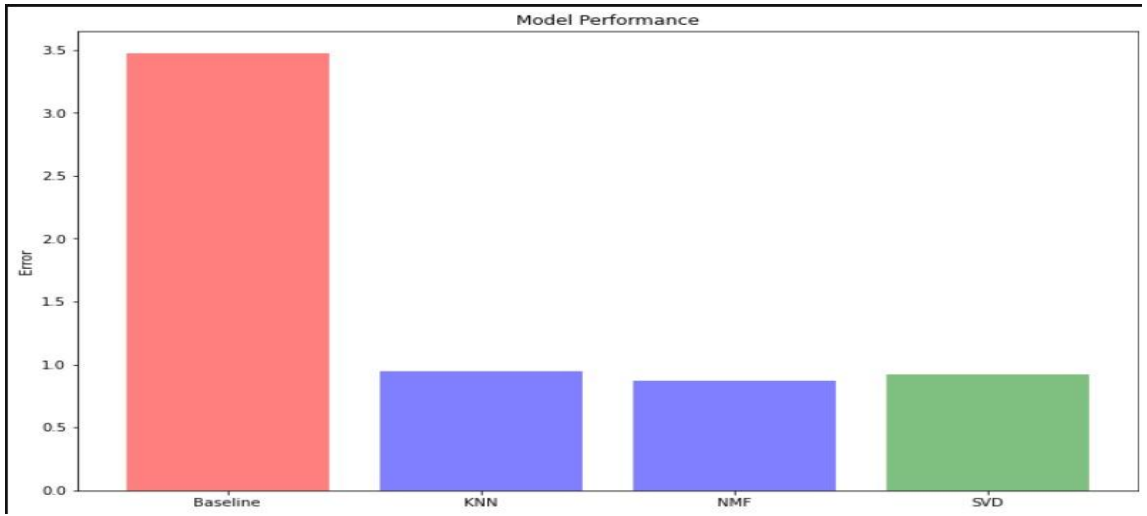


EXPLANATION OF EDA

- The top three entries in both charts remain consistent, indicating that certain movies or genres are universally well-received by users. This supports our objective of accurately identifying and recommending popular content.
- The gradual decline in rankings suggests a clear differentiation in user preferences. This aligns with our goal of generating personalized recommendations, ensuring that users are guided towards the most relevant movies based on collective behavior.

MODELLING


Model Performance
Error
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Baseline
KNN
NMF
SVD

MODELLING Cont:

- The visualization highlights that the SVD model achieved the lowest RMSE, aligning perfectly with our objective to implement and compare various algorithms to find the most accurate model for movie recommendations.
- Performance Comparison: SVD outperforms KNN and NMF in terms of RMSE, indicating it provides more accurate and personalized recommendations. This supports our goal of using the best-performing model to suggest the top movies as per user preference.

CONCLUSIONS AND RECOMMENDATIONS

1. The project has successfully addressed the core challenge of users dissatisfaction with movie recommendations, as previously noted in Google Play Store feedback
2. The system now provides more personalized movie recommendations for users .
3. The suggestions are now well aligned with users' preference and viewing history.

RECOMMENDATIONS FOR USERS

1. For effectiveness of our movie recommendation system, we recommend implementing a feedback mechanism where users can rate the relevance of the recommendations they receive.
2. Finally, it is crucial to ensure that the recommendation system is scalable to accommodate an increasing number of users and movie entries, potentially leveraging cloud-based solutions or distributed computing as necessary.

FUTURE WORKS

- Incorporate user behavior data such as watch history, search patterns, and time spent on different genres to further refine recommendations.
- Combine collaborative filtering with content-based filtering. By leveraging both user behavior and movie attributes, we can enhance recommendation accuracy and overcome the limitations of using just one method.

THANK YOU

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