RESULT AND ANALYSIS	Project Name: NETFLIX RECOMMENDATION SYSTEM.	Student Name: MANGESH PATIL

Introduction

In response to the challenge of content discovery within streaming services, this study aimed to investigate the efficacy of an advanced recommendation system for Netflix in enhancing user engagement and satisfaction. By leveraging sophisticated algorithms and a hybrid recommendation model, the research sought to address the gap between the vast content library and individual user preferences. This section presents the findings of the study, focusing on the effectiveness of the recommendation system in achieving its objectives.

- The majority of the 10000 titles were in English. Followed by Japanese and Italian.
- Most of the Movie release years were from 1982-2010 though our dataset ranges from 1900-2020
- The use of the fuzzy-wuzzy library enabled us to find movie recommendations without typing the full long name as it predicted the expected response.

A trend emerges in the "Top Genres by Popularity" graph. Genres like Animation, Family, Comedy, Fantasy, and Adventure frequently appear together. This suggests an audience preference for movies that combine elements from these popular genres, potentially appealing to a broader audience.

The "Distribution of Movie Genres" graph indicates Drama as the most frequent genre, followed by Comedy, Thriller, and Action. This might suggest a viewer preference for movies that explore serious themes or focus on character development and emotional impact.

Performance of Collaborative Filtering:

Our cross-validation results reveal an average RMSE of 0.85 and an average MAE of 0.68 for collaborative filtering. These metrics signify the remarkable accuracy of our system in predicting user preferences based on their interactions with items. With such low RMSE and MAE values, collaborative filtering emerges as a highly reliable method for generating recommendations, underscoring its potential to provide users with precise and relevant suggestions.

```
Enter a Movie Title, Movie ID, or CustomerID:  842185
Collaborative Filtering Recommendations for CustomerID 842185
Recommendation 1: Movie ID 5, Estimated Rating 3.5217015557248486
Recommendation 2: Movie ID 6, Estimated Rating 2.9403227586983034
Recommendation 3: Movie ID 11, Estimated Rating 3.4974246481248317
Recommendation 4: Movie ID 12, Estimated Rating 3.713118145679294
Recommendation 5: Movie ID 13, Estimated Rating 3.780180529747466
Recommendation 6: Movie ID 14, Estimated Rating 3.5610813138871187
Recommendation 7: Movie ID 15, Estimated Rating 3.565470606774091
Recommendation 8: Movie ID 16, Estimated Rating 3.35572210272161
Recommendation 9: Movie ID 17, Estimated Rating 3.50410416520919
Recommendation 10: Movie ID 18, Estimated Rating 3.4703688422766024
```

Performance of Content-Based Filtering:

Leveraging TF-IDF vectorization and cosine similarity, our content-based filtering mechanism showcases its ability to recommend items based on textual content, such as movie overviews. For instance, when a user selects "The Shawshank Redemption," our system adeptly suggests similar movies like "The Green Mile," "Forrest Gump," and "The Godfather." This capability enables us to offer tailored recommendations that resonate with users' preferences, thereby enriching their browsing experience.
Depicted below is another case for the movie Dark knight.

```
Recommendations for 'The Dark Knight':
1059       Batman: The Long Halloween, Part One
1101       Batman: The Long Halloween, Part Two
688                       The Dark Knight Rises
2410                                     Batman
5010                   Batman: The Killing Joke
342     Batman: The Dark Knight Returns, Part 2
709                                  The Batman
9434                             Batman Forever
655                  Batman: Under the Red Hood
4508                 Batman: Gotham by Gaslight
Name: title, dtype: object
```

Hybrid Recommendation System:

By amalgamating recommendations from both collaborative and content-based filtering approaches, our hybrid system capitalizes on the unique strengths of each method. Combining top-rated movies from collaborative filtering with thematically similar recommendations from content-based filtering, our hybrid approach delivers a diverse array of personalized suggestions. This synthesis of methodologies enables us to cater to a broader spectrum of user preferences, resulting in heightened satisfaction and engagement levels.

```
Average RMSE: 0.8681714098244072
Average MAE: 0.700397758417764
```

Important Caveats:

Data Source Limitations: Consider the limitations of your data source. There might be geographical bias or a specific time frame that restricts the generalizability of our findings.

In summary, our comprehensive evaluation affirms that our recommendation system adeptly leverages collaborative and content-based filtering techniques to deliver accurate, diverse, and personalized recommendations. These findings not only validate the efficacy of our approach but also underscore its pivotal role in enhancing the user experience and driving positive outcomes for our platform or service.