Book Recommendation System Project

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Abstract

This project implements a content-based and collaborative filtering book recommendation system using the Book Recommendation Dataset from Kaggle. The system analyzes book metadata and user ratings to generate personalized recommendations through two approaches:

• A popularity-based recommender that ranks books by average rating and number of ratings.

• A collaborative filtering recommender that uses user–item interactions and cosine similarity to find similar books.

Introduction to the Problem

Readers are often overwhelmed by the vast number of books available, making it difficult to find titles that match their interests. A recommendation system helps users discover relevant books by leveraging past interactions (ratings) and book characteristics (metadata).

My Approach and Solution

1. Popularity-Based Recommender:

- Merge book metadata with user ratings.

- Compute for each book: average rating and number of ratings.

- Rank and list top books by these metrics.

2. Collaborative Filtering Recommender:

- Build a user–book rating matrix.

- Calculate cosine similarity between book vectors.

- For a given target book, recommend other books sorted by similarity score.

Results and Discussion

• Popularity Model surfaced classics like the Harry Potter series and The Hobbit, reflecting general consensus favorites.

• Collaborative Filtering provided more personalized suggestions (e.g., for The Da Vinci Code, it recommended Angels & Demons and Touching Evil), capturing thematic or user-driven similarities.

• Both methods have complementary strengths: simplicity and broad appeal versus nuanced personalization.

Conclusion

• Popularity-based recommendations are easy to interpret and implement, highlighting universally loved books.

• Collaborative filtering uncovers deeper, personalized connections between titles.

• Future work: Explore hybrid models, matrix factorization (SVD), or deep learning–based embeddings; build a user-facing interface.

References

1. Book Recommendation Dataset on Kaggle:
https://www.kaggle.com/datasets/arashnic/book-recommendation-dataset