Book Recommendation System

Problem Formulation

Design and develop an intelligent book recommendation system that can accurately suggest relevant books to users based on their preferences, reading history, and other relevant factors.

Methodology

Collaborative-based Filtering: This approach relies on analyzing past user interactions and target items, it searches for users who are similar to each other based on their past interactions with books. For instance, If User A and User B have common interests in books, like science fiction, the system recommends books that one user has read and the other hasn't. For instance, if User A read "The Martian," the system will suggest it to User B, while if User B read "Harry Potter," it will be recommended to User A. This way, the system leverages shared preferences to offer personalized book recommendations. This way, the recommendation system leverages the preferences of "look-alike" users to suggest relevant books to each individual user.

We'll use **Pandas**, **Matplotlib**, **Seaborn**, **scikit-learn**, **Surprise**.

Data Description

The Book Recommendation Dataset consists of 3 CSV files: Books.csv – Ratings.csv – Users.csv
The Books file contains data about the books such as title, author, publication year, etc.
The Ratings file contains the user id, ISBN, and book rating.
The Users file contains the user id, location, and age.

Evaluation Methods

Mean Absolute Error (MAE): This metric calculates the average absolute difference between the predicted ratings and the actual ratings given by users. A lower MAE indicates better performance.

Root Mean Squared Error (RMSE): Similar to MAE, RMSE calculates the average squared difference between predicted and actual ratings. RMSE is also used to measure the accuracy of the system, with lower values indicating better performance.

Coverage: refers to the extent to which the system can provide recommendations for a diverse and comprehensive set of books from the entire catalog. A high coverage means that the recommendation system is capable of suggesting a wide range of books to different users, including both popular and niche titles, rather than being limited to only a small subset of popular choices.

Results Expectations

A recommendation system that recommends books to users based on their interests. With a high performance across the defined evaluation metrics.