Movie Recommendation System

Introduction

With the exponential growth of online content, users often struggle to find relevant movies suited to their preferences. A movie recommendation system aims to provide personalized suggestions to users based on their interests and past behavior. This project uses both Collaborative Filtering and Content-Based Filtering techniques to recommend movies effectively.

Abstract

The project implements a dual-approach recommendation system that combines Collaborative Filtering and Content-Based Filtering. Collaborative Filtering leverages user ratings to find similar preferences among users, while Content-Based Filtering analyzes movie genres to suggest similar content. The system is developed using Python and Streamlit, and uses datasets from MovieLens. Users can interact with the system through a simple web interface, select a movie they like, and receive a list of recommended movies.

Tools Used

- **Programming Language**: Python
- **Libraries**:

    Pandas

    NumPy

    Scikit-learn

    SciPy

    Streamlit

- **Dataset**: MovieLens (movies.csv and ratings.csv)
- **IDE**: Visual Studio Code

Steps Involved in Building the Project

1. **Data Collection**:
   Loaded datasets (movies.csv, ratings.csv) from MovieLens.

2. **Data Preprocessing**:
   Cleaned data, removed duplicates, handled missing values, and sampled a manageable subset for performance.

3. **Content-Based Filtering**:

   -Used CountVectorizer to convert genres into numerical vectors.

   -Calculated cosine similarity between movie genre vectors.

4. **Collaborative Filtering**:

   -Merged movie and rating datasets.

   -Created a user-movie rating matrix.

   -Applied cosine similarity on the transposed matrix to identify similar movies based on user behavior.

5. **Recommendation Logic**:

   -Implemented two functions: recommend_by_genre and recommend_collaborative.

   -Displayed recommendations in Streamlit interface based on selected movie.

6. **User Interface with Streamlit**:

   -Built a clean and interactive web interface.

   -Users can select a movie and receive recommendations instantly.

Conclusion

The Movie Recommendation System successfully demonstrates the use of both collaborative and content-based filtering techniques to enhance user experience in content discovery. This hybrid approach provides more accurate and personalized recommendations. The system is modular and can be extended further by incorporating user feedback, NLP on movie overviews, and advanced deep learning methods for improved performance.