Movie Recommendation System

Mini Project Report

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Introduction

In today's digital age, users are often overwhelmed by the sheer volume of media available. A movie recommendation system helps filter this vast collection and provide personalized suggestions. This mini project aims to build a recommendation system using machine learning to recommend movies based on user preferences.

Abstract

This project implements a hybrid movie recommendation system using the popular MovieLens dataset. It combines collaborative filtering and content-based filtering (using genres) to generate top 5 personalized recommendations for any selected movie. A Streamlit-based web interface allows users to interact with the system in real-time. This project demonstrates the power of combining different machine learning techniques for better accuracy and usability in recommendation engines.

Tools & Technologies Used

- Language: Python
- Libraries: Pandas, Scikit-learn, Streamlit
- Dataset: MovieLens 100k (u.data, u.item)
- IDE: VS Code
- Web Framework: Streamlit for frontend interface

Steps Involved in Building the Project

1. Dataset Preparation

Downloaded and extracted the MovieLens 100k dataset. Loaded movie and rating data using pandas.

2. Preprocessing

Merged ratings with movie titles and genres. Cleaned and reshaped data for model input.

3. Collaborative Filtering

Constructed a user-movie rating matrix. Computed cosine similarity between movie vectors to recommend based on similar rating behavior.

4. Content-Based Filtering

Used genre vectors from the dataset. Calculated similarity between movies based on genre overlap using cosine similarity.

5. Hybrid Recommendation Model

Averaged both collaborative and content-based scores to generate final recommendations.

6. User Interface (UI)

Built an interactive interface using Streamlit, allowing users to select a movie and view top 5 recommendations.

Conclusion

This project successfully demonstrates a working hybrid movie recommendation system using machine learning techniques. The system provides accurate and personalized suggestions based on both user behavior and movie content. It is efficient, scalable, and can be extended in the future by integrating review sentiment analysis, user authentication, or real-time data.