Hybrid Movie Recommendation System: Project Report

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1. Introduction

In today's digital world, users are often overwhelmed with the abundance of choices, especially in online streaming platforms. A recommendation system plays a vital role in personalizing content and enhancing user satisfaction. This project, titled **Hybrid Movie Recommendation System**, aims to suggest relevant movies based on user preferences using a blend of content-based and collaborative filtering techniques.

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2. Abstract

This project utilizes the MovieLens 1M dataset to build a hybrid movie recommendation system that combines the strengths of content-based filtering (using movie genres) and collaborative filtering (using user ratings and nearest neighbors). The user-friendly interface is built with Streamlit, offering a responsive and interactive experience where users can select a movie and receive top 5 personalized recommendations.

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3. Tools Used

- **Python**: Core programming language.
- **Pandas**: Data manipulation and preprocessing.
- **Scikit-learn**: Building content and collaborative filtering models.
- **Streamlit**: For building the interactive UI.
- **Streamlit-lottie**: For integrating animations into the UI.
- **Requests**: Fetching Lottie animations from online sources.

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4. Steps Involved in Building the Project

1. **Data Loading**:
    - MovieLens dataset (movies.dat and ratings.dat) loaded and processed using Pandas.
2. **Preprocessing**:
    - Cleaning and structuring movie genres and user ratings.
3. **Content-Based Filtering**:
    - TF-IDF vectorization of genres.
    - Cosine similarity used to find movies with similar genres.
4. **Collaborative Filtering**:

- User-item matrix created from ratings.
- K-Nearest Neighbors model trained to find similar movies based on user interactions.

5. **Hybrid Recommendation Logic**:

   - Weighted combination of content and collaborative scores to generate final recommendations.

6. **Frontend with Streamlit**:

   - Users can choose a movie from a dropdown.
   - On clicking the recommendation button, top 5 suggestions are shown.
   - Lottie animations enhance UI engagement.

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5. Conclusion

The hybrid movie recommendation system successfully demonstrates the power of combining content and collaborative filtering to enhance recommendation accuracy. The intuitive Streamlit interface makes it accessible to users, providing personalized movie suggestions with just a click. This project not only showcases essential machine learning concepts but also emphasizes UI/UX design in real-world applications.

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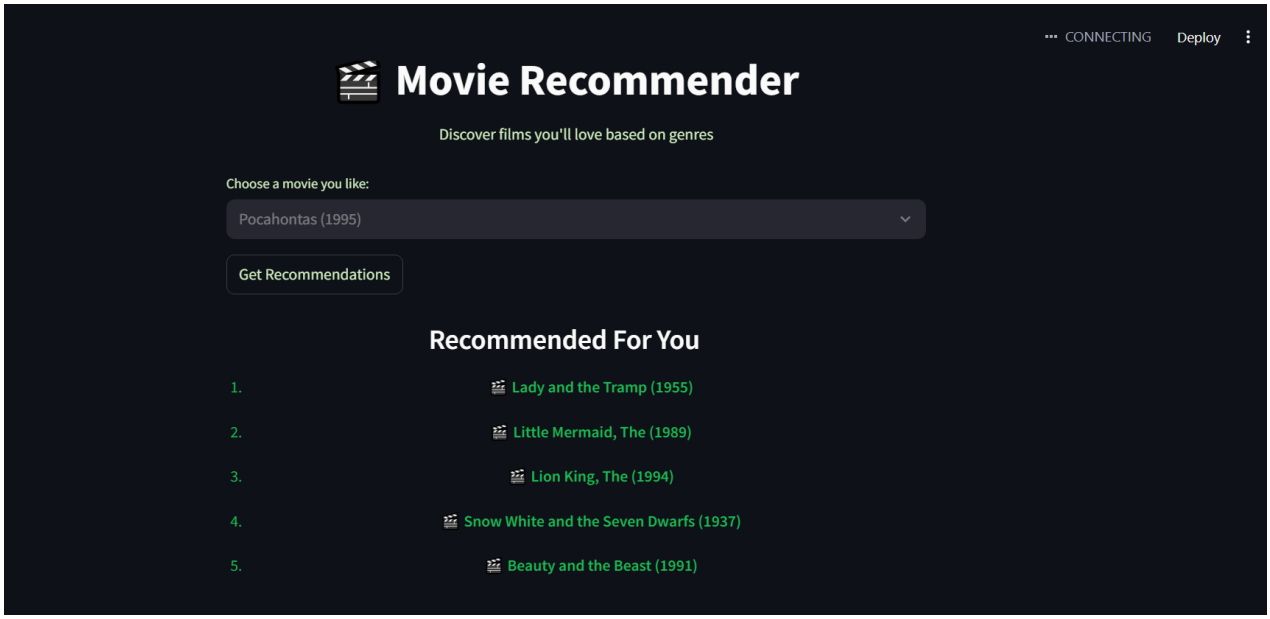
6. User Interface



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Dataset Source: https://grouplens.org/datasets/movielens/1m/