Movie Recommendation System

This is a hybrid movie recommendation system built using a combination of content-based filtering, collaborative filtering (user-based), and Alternating Least Squares (ALS) algorithms. The system is designed to recommend movies based on user preferences and historical interactions with movies. The project uses the Movie Lens dataset for training and evaluation.

Data set used

For Movie Recommendation System Project i use Movie Lens dataset. Here is the link:-

Go through this link https://grouplens.org/datasets/movielens/ and then download the zip file ml-32m.zip . Then extract the zip file for project, take **movies.csv** and **ratings.csv** file .

Features

- **Hybrid Recommendation:** Combines content-based filtering, collaborative filtering, and ALS techniques to provide accurate movie recommendations.
- **Customizable Output:** Users can specify the number of movie recommendations they want, up to a customizable "Top N".
- **Web Interface:** The system has been deployed using Flask, allowing users to interact with the recommendation engine through an intuitive web form.

Technologies Used

- **Python**: Core language used to build the recommendation engine.
- **Pandas**: For data manipulation and analysis.
- **Scikit-learn**: Used for content-based filtering, building KNN models for collaborative filtering, and evaluation.
- **Seaborn**: used for visualization
- **KNN (from Scikit-learn)**: Used for user-based collaborative filtering instead of the Surprise library.
- **Flask**: Web framework for deploying the system with a front-end HTML interface.
- **Pickle (.pkl)**: Serialized model files used for efficient storage and retrieval of the recommendation models.

Features

- Combines multiple recommendation algorithms
- Flask-based backend API
- HTML frontend interface

- Model serialized with `pickle` for easy deployment

Usage

1. Enter a Movie: Type the name of a movie in the search bar.
2. Select Top N Recommendations: Choose how many movie recommendations you'd like (e.g., 10, 50, etc.).
3. Get Recommendations: The system will display a list of movie suggestions based on the input.

Project Structure:

```
Movie_Recommendation_System/
├── app.py
├── templates/
│   └── index.html
├── static/
├── models/
│   ├── content_based_model.pkl
│   ├── user_based_model.pkl
│   └── als_model.pkl
├── data/
│   ├── movies.pkl
│   └── ratings.pkl
└── movie_recommendation.ipynb
```

How to Run the Project:

1. Clone the Repository

```
git clone https://github.com/Madhusmita2004/Movie_Recommendation_System.git
cd Movie_Recommendation_System
```

2. Install Dependencies

```
pip install -r requirements.txt
```

3. Run the Flask App

```
python app.py
```

4. View in Browser

Then open your browser and go to:
http://127.0.0.1:5000

5. Frontend (Optional)

Open index.html and use it to submit your movie name, user ID, and get recommendations.

📁 Files

- **movie recommendation.ipynb** - In this file the project code and .pkl file code are Available

- **app.py** - Flask backend API

- **index.html** - Frontend UI

- ***.pkl** - Pickle files for models and data

- **README.md** - Project details