Project Report: Movie Recommender System

1. Project Overview

The **Movie Recommender System** is a data-driven web application designed to provide users with top-rated movie suggestions based on their specific preferences for **Language** and **Genre**. Built using **Python** and the **Streamlit** framework, the system offers an interactive interface to explore cinematic content across various regional and global languages.

2. System Architecture & Technologies

The project utilizes the following technology stack:

- **Language:** Python 3.x

- **Frontend Framework:** Streamlit (for the interactive web UI)

- **Data Manipulation:** Pandas (for filtering and sorting the dataset)

- **Data Parsing:** ast (to process stringified list data in the CSV)

- **Development Environment:** VS Code

3. Implementation Details

The application follows a structured data pipeline to ensure accurate recommendations:

3.1 Data Loading & Preprocessing

The system loads a movies.csv file. It includes a robust preprocessing function (load_and_preprocess) that:

- Handles multiple encodings (utf-8 and latin1).

- Extracts genre names from complex stringified JSON formats.

- Cleans missing values in titles, ratings, and overviews to prevent app crashes.

3.2 Recommendation Logic

The recommendation engine uses **Content-Based Filtering**. It filters the dataset based on the user's selected languages and genre, then sorts the results by vote_average to present the highest-rated films first.

4. User Interface & Results

The following screenshots demonstrate the functional application and the data used for testing.

4.1 Data Verification

This screenshot shows the raw data comparison between movie names and their corresponding IMDb ratings used for validation.

4.2 Regional Language Support

The app successfully identifies and recommends top-rated regional content.

🎬 Movie Recommender System

Select your preferred language and genre to get top-rated movie recommendations instantly!

🌐 Select Language(s):

Tamil ×   ⚙ ⌄

🎭 Select Genre:

Action   ⌄

🎬 Show Recommendations

Top 10 Action Movies for Tamil:

🎬 Baashha

⭐ **Rating:** 8.6

🎭 **Genres:** Action

🌐 **Language:** Tamil

📝 **Overview:** An auto driver's gangster past resurfaces in dramatic fashion....

🎬 Kaala

⭐ **Rating:** 8.5

🎭 **Genres:** Action

🌐 **Language:** Tamil

📝 **Overview:** A leader fights for the rights of slum dwellers against land mafia....

🎬 Indian

⭐ **Rating:** 8.5

🎭 **Genres:** Action

🌐 **Language:** Tamil

📝 **Overview:** An old freedom fighter eliminates corruption vigilante-style....

🎬 Master

⭐ **Rating:** 8.4

🎭 **Genres:** Action

🌐 **Language:** Tamil

📝 **Overview:** A professor reforms young criminals while facing a ruthless gangster....

🎬 Dasavathaaram

⭐ **Rating:** 8.3

🎭 **Genres:** Action

🌐 **Language:** Tamil

📝 **Overview:** Kamal Haasan plays 10 roles; story blends science and history....

🎬 Vikram

⭐ **Rating:** 8.3

🎭 **Genres:** Action

🌐 **Language:** Tamil

📝 **Overview:** Parthiban, a café owner,lives with his family in himachal pradesh.Things take an absurd turn for him when he gets in the way of drug cartel....

🎬 Movie Recommender System

Select your preferred language and genre to get top-rated movie recommendations instantly!

🌐 Select Language(s):

Malayalam ×   ⚙ ⌄

🎭 Select Genre:

Horror   ⌄

🎬 Show Recommendations

Top 5 Horror Movies for Malayalam:

🎬 Bhoothakalam

⭐ **Rating:** 8.7

🎭 **Genres:** Horror, Psychological Drama

🌐 **Language:** Malayalam

📝 **Overview:** A mother and son confront supernatural and emotional demons in their home....

🎬 Manichithrathazhu

⭐ **Rating:** 8.5

🎭 **Genres:** Psychological Thriller, Drama, Horror

🌐 **Language:** Malayalam

📝 **Overview:** A newlywed woman is suspected of being possessed by a spirit, leading to a psychiatrist's attempt to unravel the truth....

🎬 Aparichithan

⭐ **Rating:** 8.3

🎭 **Genres:** Psychological Thriller, Horror

🌐 **Language:** Malayalam

📝 **Overview:** A psychiatrist treating a patient with multiple personalities uncovers dark secrets....

🎬 Ezra

⭐ **Rating:** 8.0

🎭 **Genres:** Horror, Supernatural Thriller

🌐 **Language:** Malayalam

📝 **Overview:** A couple faces a haunting spirit trapped in a dybbuk box....

🎬 Anjaam Pathiraa

⭐ **Rating:** 7.9

🎭 **Genres:** Thriller, Crime, Horror

🌐 **Language:** Malayalam

📝 **Overview:** A criminal psychologist helps hunt a serial killer targeting police officers....

🎬 Movie Recommender System

Select your preferred language and genre to get top-rated movie recommendations instantly!

🌐 Select Language(s):

English ×   ⚙ ⌄

🎭 Select Genre:

Adventure   ⌄

👥 Show Recommendations

Top 10 Adventure Movies for English:

🎬 The Prisoner of Zenda

⭐ **Rating:** 8.4

🎭 **Genres:** Adventure, Drama, Romance

🔵 **Language:** English

📝 **Overview:** An Englishman on a Ruritarian holiday must impersonate the king when the rightful monarch, a distant cousin, is drugged and kidnapped....

🎬 Spirited Away

⭐ **Rating:** 8.3

🎭 **Genres:** Fantasy, Adventure, Animation, Family

🔵 **Language:** English

📝 **Overview:** A ten year old girl who wanders away from her parents along a path that leads to a world ruled by strange and unusual monster-like animals. Her parents have been changed into pigs along with others inside a bathhouse full of these creatures. Will she...

🎬 Princess Mononoke

⭐ **Rating:** 8.2

🎭 **Genres:** Adventure, Fantasy, Animation

🔵 **Language:** English

📝 **Overview:** Ashitaka, a prince of the disappearing Ainu tribe, is cursed by a demonized boar god and must journey to the west to find a cure. Along the way, he encounters San, a young human woman fighting to protect the forest, and Lady Eboshi, who is trying to ...

🎬 The Empire Strikes Back

⭐ **Rating:** 8.2

🎭 **Genres:** Adventure, Action, Science Fiction

🔵 **Language:** English

📝 **Overview:** The epic saga continues as Luke Skywalker, in hopes of defeating the evil Galactic Empire, learns the ways of the Jedi from aging master Yoda. But Darth Vader is more determined than ever to capture Luke. Meanwhile, rebel leader Princess Leia, cocky ...

🎬 Howl's Moving Castle

⭐ **Rating:** 8.2

🎭 **Genres:** Fantasy, Animation, Adventure

🔵 **Language:** English

📝 **Overview:** When Sophie, a shy young woman, is cursed with an old body by a spiteful witch, her only chance of breaking the spell lies with a self-indulgent yet insecure young wizard and his companions in his legged, walking home....

5. Conclusion & Future Scope

The current system effectively provides high-quality recommendations based on user input.
Future Enhancements:

- **Collaborative Filtering:** Implementing user-based similarities to suggest movies based on what other similar users liked.

- **Poster Integration:** Connecting to an API like **TMDB** to display movie posters alongside descriptions.

- **Search Functionality:** Adding a search bar for users to find specific titles.