

Movie Recommendation System

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Abstract

Choosing a movie to watch can be tough with so many options out there. This project helps solve that problem by recommending movies based on what a person already likes. It uses machine learning to find similar movies and even shows their posters and descriptions using the Gemini API. The system is built using Python and a simple web app framework called Streamlit. The final result is a user-friendly movie recommendation app that feels smart and easy to use.

1. Introduction

Everyone has faced the “what should I watch next?” dilemma. This project is a solution to that. It helps users find movies similar to the ones they like. The system uses movie data and ratings to understand patterns and suggest similar titles. It also shows movie posters and a short summary to make it more fun and useful. The main goal was to make a smart system that’s also easy to use.

2. Background

How Movie Recommendations Work

Big platforms like Netflix and YouTube use similar technology to show suggestions. They either:

- Recommend based on what you’ve liked before (called collaborative filtering).
- Recommend based on the type or genre of the movie (called content-based filtering).

In our project, we use **collaborative filtering**, which looks at how different users rated different movies and finds patterns.

3. Tools Used

- **Python** – Main programming language
- **Streamlit** – Used to build the website or app
- **Pandas** – For handling and cleaning the movie data
- **Scikit-learn** – For calculating which movies are similar
- **Pickle** – To save and load data quickly
- **Gemini API** – To show posters and movie summaries
- **Jupyter Notebook** – Used while developing and testing the system

4. How the System Works

Step 1: Prepare the Data

We used a movie dataset that contains titles, genres, and user ratings. We cleaned this data and converted it into a form that the computer can use to find patterns.

Step 2: Find Similar Movies

We used a method called **cosine similarity** to see how closely related two movies are based on user ratings. For example, if people who like *Inception* also like *Interstellar*, they are considered similar.

Step 3: Show Recommendations

Once the system finds similar movies, it uses the Gemini API to grab poster images and short descriptions. Then, it shows the top 5 similar movies to the user.

Step 4: Build the Interface

Using Streamlit, we created a simple website where:

- Users choose a movie from a dropdown.

- The system instantly shows 5 related movie suggestions with pictures and info.

5. Example Result

If you select the movie **Inception**, the system might suggest:

1. Interstellar
2. Shutter Island
3. Tenet
4. The Prestige
5. Memento

These are similar either in theme, director, or story style.

6. Conclusion

This movie recommendation system makes it easier to find movies you'll enjoy. It uses smart algorithms to compare movies and gives helpful suggestions. On top of that, it's visual and interactive, thanks to the API integration and Streamlit web app.

Limitations

- It only works well if the movie exists in the dataset.
- It may not perform as well for newly released movies with little data.

What Can Be Improved

- Add user login to remember preferences.
- Combine different types of recommendations (not just collaborative).
- Allow users to give feedback (like/dislike).
- Deploy the app online for everyone to use.

References

- Scikit-learn: Machine Learning Library
- Streamlit: Web App Framework for Data Science
- Gemini API: For Posters and Movie Info
- Python & Pandas: For Data Handling