
# Movie Recommendation System

# Objective:

The objective of this project is to design, develop, and implement a robust and accurate movie recommendation system using collaborative filtering algorithm.

# Abstract


- This project report documents the design, development, and evaluation of a movie recommendation system.
- In an era where personalized content discovery is essential, recommendation systems play a critical role in assisting users in finding relevant and engaging movies.
- The system will recommend movies using collaborative filtering algorithm by finding the relationships between the user ratings and providing the recommendations..
- The objective of this project is to create an effective recommendation system capable of providing accurate movie suggestions to users based on their preferences and historical ratings.

# System Flow

1. **Data Collection:**

   Gather data on user interactions with movies. This data typically includes user ratings, reviews, and viewing history.

2. **Data Preprocessing:**

   Clean the data to remove duplicates, handle missing values, and ensure data quality.

   Convert user-item interactions into a user-item matrix, where rows represent users, columns represent movies, and the matrix cells contain user ratings or other relevant metrics.

# System Flow (Contd....)

## 3. User-Based Collaborative Filtering:

Identify users with similar tastes based on their historical ratings and interactions.

For a target user, identify similar users and recommend movies that these similar users have liked but the target user has not seen.

## 4. Item-Based Collaborative Filtering:

Determine movie similarities by calculating similarity scores between movies.

For a target user, recommend movies that are similar to the ones they have rated highly or interacted with in the past.

# System Flow (Contd....)

## 5. Predicting Ratings:

Use the collaborative filtering algorithms to predict ratings for movies that a user has not yet interacted with.

Combine user-based and item-based predictions if desired.

## 6. Top-N Recommendations:

Generate a list of top-N movie recommendations for each user based on predicted ratings.

Rank the recommended movies by their predicted ratings or other relevant criteria (e.g., diversity, novelty).

# System Flow (Contd....)

## 7. Evaluation:

Assess the performance of the recommendation system using evaluation metrics such as Mean Absolute Error (MAE), Root Mean Square Error (RMSE), Precision, Recall, or F1-score.

Split the data into training and testing sets to measure how well the system generalizes to new user-item interactions.

## 8. Personalization:

Customize recommendations for each user by considering their individual preferences and feedback over time.

Implement techniques like matrix factorization (e.g., Singular Value Decomposition) to enhance personalization.

# System Flow (Contd....)

## 9. Deployment/Evaluation:

Deploy/evaluate the recommendation system to get real-time movie recommendations

## 10. Continuous Improvement:

Continuously collect user feedback and update the recommendation model to adapt to changing user preferences and trends.

# System Flow Diagram