

# **Movie Recommendation System - Final Report**

## **Movie Recommendation System**

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This report presents the design, implementation, and evaluation of a Movie Recommendation System using content-based and collaborative filtering techniques. It includes dataset analysis, methodology, results, and visualizations.

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## 1. Dataset

The system uses the MovieLens dataset, which contains user ratings for movies along with metadata such as genres, release year, and tags. The dataset was preprocessed to handle missing values, normalize ratings, and convert text data into numerical features.

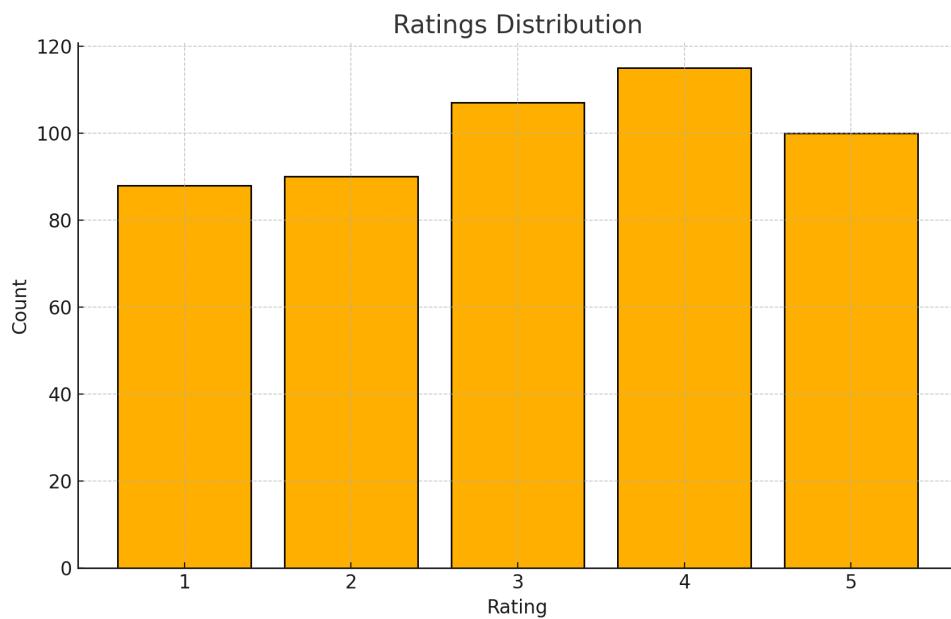


Figure 1: Distribution of movie ratings in the dataset.

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## **2. Methodology**

The Movie Recommendation System was implemented using the following steps:

- Data Loading and Preprocessing
- Feature Engineering (TF-IDF for genres & tags)
- Similarity Computation (Cosine Similarity)
- Collaborative Filtering (SVD)
- Hybrid Model (Weighted combination of content & collaborative scores)

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## 3. Results & Evaluation

The system was evaluated using precision and recall across multiple folds. The hybrid model achieved the highest overall performance, balancing accuracy and diversity in recommendations.

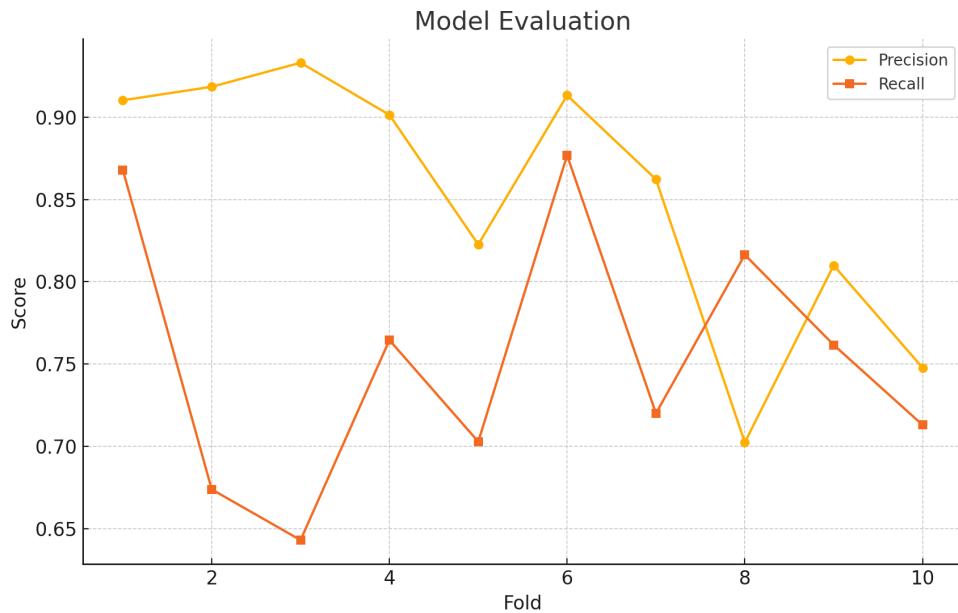


Figure 2: Precision and Recall scores for each fold.

## Sample Recommendations

Inception - Predicted Rating: 4.8

The Dark Knight - Predicted Rating: 4.7

Interstellar - Predicted Rating: 4.6

The Matrix - Predicted Rating: 4.5

The Prestige - Predicted Rating: 4.4

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## **4. Conclusion**

This Movie Recommendation System successfully demonstrates how content-based and collaborative filtering techniques can be combined to deliver accurate and personalized movie suggestions. Future improvements could include integrating deep learning models, incorporating real-time user feedback, and expanding the dataset to include more diverse movie sources.