Movie Recommendation System - Project Report

Introduction

This project aims to build a Movie Recommendation System using collaborative filtering techniques. Recommender systems are widely used in digital platforms like Netflix, Amazon, and YouTube to improve user engagement by suggesting personalized content.

Abstract

The recommendation engine leverages the MovieLens dataset, applying collaborative filtering algorithms to predict user preferences and suggest relevant movies. By utilizing similarity metrics between users or items, the system provides effective recommendations even for users with minimal data. This implementation uses the Surprise library and evaluates results using RMSE (Root Mean Squared Error).

Tools Used

- Python
- Pandas & NumPy
- Surprise (scikit-based recommendation lib)
- Scikit-learn
- Matplotlib & Seaborn

Steps Involved in Building the Project

1. **Data Collection**: Used MovieLens 100k dataset with user-movie ratings.
2. **Data Preprocessing**: Merged datasets, handled missing values, created user-item matrix.
3. **Model Building**: Implemented collaborative filtering using KNNBasic algorithm from Surprise library.
4. **Similarity Measures**: Used cosine similarity for user-user and item-item matching.
5. **Evaluation**: Model evaluated using RMSE to ensure prediction quality.
6. **Recommendation**: Top-N recommendations generated for each user.

Conclusion

The Movie Recommendation System effectively demonstrates collaborative filtering using real-world data. The approach is scalable and can be enhanced further using matrix factorization or deep learning techniques. This type of recommender system is essential for improving user satisfaction in digital content platforms.