**Student Name :** MENAKA T

**Register Number :** 732323106031

**Institution :** SSM College Of Engineering

**Department :** Electronics and Communication Engineering

**Date of Submission :** April 23,2025

**1.Problem Statement**

* In today's digital era, users are overwhelmed by the vast array of movie options available across streaming platforms.
* The lack of personalized recommendations often leads to decision fatigue and a poor user experience.
* This project addresses the need for a smart, AI-driven recommendation system that not only suggests movies based on user preferences
* but also incorporates a matchmaking mechanism that aligns movies with the emotional and behavioral traits of users, enhancing overall satisfaction.

**2.Objectives of the Project**

* To build a personalized movie recommendation system using machine learning and AI algorithms.
* To integrate a matchmaking model that maps user personality traits or emotional states to suitable movie genres.
* To improve user engagement by offering context-aware and user-centric movie suggestions

**3.Scope of the Project**

* User profile analysis and behavioral pattern identification.
* Recommendation based on collaborative filtering and content-based filtering techniques
* . - Integration of a matchmaking model based on user emotional feedback.
* Limitations: Focus on English-language movies; limited to publicly available datasets; initial version deployed as a web app.

**4.Data Sources**

* MovieLens Dataset from GroupLens (Public, static)
* TMDB API for additional metadata (Public, dynamic)
* Synthetic user preference data generated for matchmaking modeling

**5.High-Level Methodology**

* + Data Collection: Download datasets from MovieLens and TMDB API; simulate synthetic user feedback for matchmaking.
  + Data Cleaning: Handle missing fields, remove duplicates, and normalize genre/ratings data.
  + EDA: Use visualizations like bar charts, heatmaps, and scatter plots to analyze user ratings and genre popularity.
  + Feature Engineering: Create features like average user rating, genre frequency, similarity scores.
  + Model Building: Implement collaborative filtering, content-based filtering, and hybrid models using k-NN, matrix factorization, and neural networks.
  + Model Evaluation: Use metrics like RMSE, Precision@k, and Recall@k.
  + Visualization & Interpretation: Dashboards to show user recommendation results, genre match graphs, and performance metrics
* . - Deployment: Deploy the system as an interactive web app using Streamlit or Flask.

**6.Tools and Technologies**

* Programming Language : Python
* Notebook/IDE : Google Colab, Jupyter Notebook
* Libraries : pandas, numpy, seaborn, matplotlib, scikit-learn, TensorFlow, Surprise, requests
* Optional Tools for Deployment: Streamlit, Flask, Gradio

**7.Team Members and Roles**

* Menaka - Problem Statement & Objective Definition, Scope of project
* Madhanraj - Data Sources & Data Collection Methodology
* Meganathan - High-level Methodology, including EDA, Feature Engineering, Model Building and Evaluation
* Maga - Tools and Technologies, Visualization & Deployment Planing