

Movie Recommendation Engine - Complete Summary

What is a Movie Recommendation Engine?

A system that uses AI to suggest films to users based on their preferences, behavior, and past activity.

How Does It Work?

1. Content-Based Filtering: Recommends similar movies using metadata.
2. Collaborative Filtering: Suggests based on similar users' likes (User-User, Item-Item).
3. Hybrid Filtering: Combines both techniques for better accuracy.

Key Components

- User Data: Preferences, ratings, history.
- Movie Metadata: Genre, cast, etc.
- Ratings Matrix: Users vs. Movies.
- Similarity Measures: Cosine similarity, etc.
- Modeling: SVD, Neural networks, clustering.

Use Cases

- OTT Platforms: Personalized suggestions.
- E-commerce: Recommend DVDs.
- Booking Apps: Suggest popular films.
- Marketing: Target audience with trailers.

Why is it Needed?

- Personalization and retention.
- Increases engagement and revenue.
- Competitive advantage in streaming industry.

Data Needed

- User Data: Ratings, history, demographics.
- Movie Data: Tags, genre, synopsis.
- Interaction: Clicks, skips, rewatches.

Evaluation Metrics

- Precision & Recall, RMSE, Hit Ratio, User Feedback.

Tools & Technologies

- Languages: Python, R
- Libraries: Scikit-learn, Surprise, TensorFlow
- NLP: SpaCy, Transformers
- Deployment: Flask, Streamlit, Docker

Advanced Techniques

- Deep Learning: Autoencoders, NCF
- Knowledge Graphs
- Reinforcement Learning
- Context-Aware Recommendations

Example: Netflix

Uses hybrid systems, real-time data, A/B testing, personalized visuals.

Sample Project Idea

Use MovieLens dataset:

1. Clean data.

2. Implement collaborative filtering.
3. Use content-based filtering with TF-IDF.
4. Combine in hybrid model.
5. Build UI with Streamlit/Flask.