

TERM PROJECT
PYTHON PROGRAMMING
SE 383

MOVIE/SERIES REVIEW SYSTEM
An Intelligent Movie/Series Review
System with Sentiment Analysis and
Personalized Recommendations

Submitted by
Hüseyin Eray KIZILKAYA
220706302



25/05/2025

Table of Contents

Introduction.....	3
Project Overview.....	3
Objectives.....	3
System Architecture.....	3
Components.....	4
Frontend (GUI - Tkinter & ttk).....	4
Backend (Python & OOP).....	4
AI Engine (TextBlob & scikit-learn).....	4
Data Storage (JSON Files).....	4
AI Features Implementation.....	5
1. Sentiment Analysis.....	5
2. Recommendation System.....	5
3. AI-Powered Rating Suggestions.....	6
AI Testing & Results.....	6
1. Sentiment Analysis Accuracy.....	6
2. Recommendation Relevance.....	7
3. Rating Suggestion Performance.....	7
Future Improvements.....	7
Conclusion.....	7

Introduction

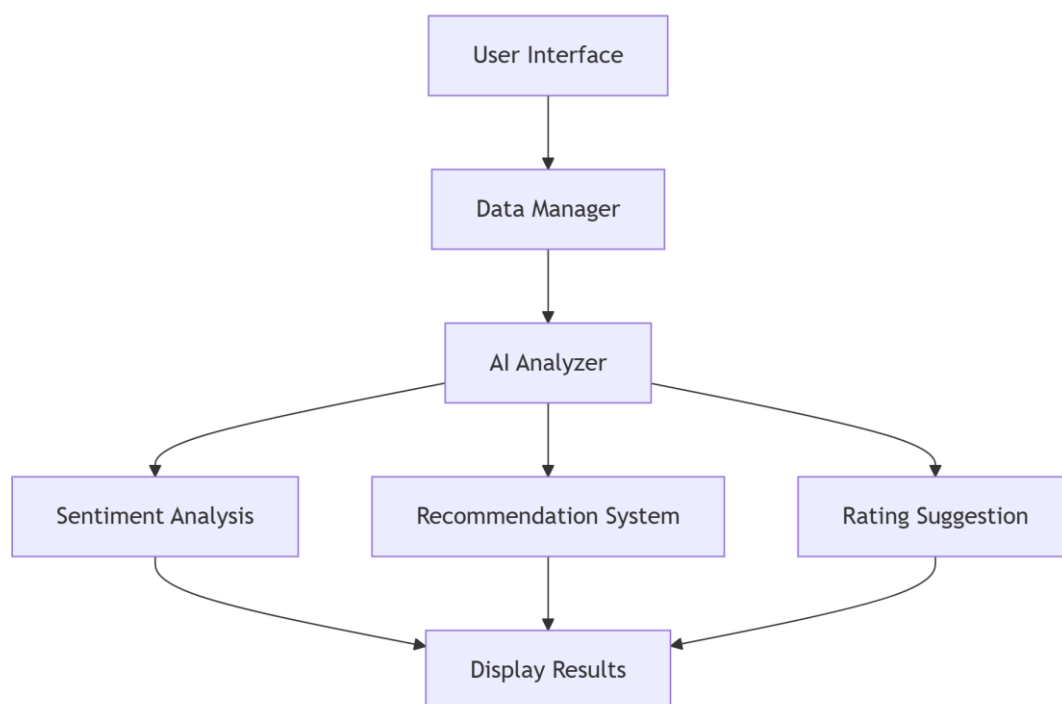
Project Overview

The AI-Enhanced Movie & TV Series Review System is a Python-based desktop application built using Tkinter for the GUI, integrated with Artificial Intelligence (AI) to provide sentiment analysis, smart recommendations, and AI-powered rating suggestions. This system transforms traditional movie review platforms by incorporating Natural Language Processing (NLP) and machine learning to deliver a smarter, personalized user experience.

Objectives

- Automate sentiment analysis of user reviews (Positive/Negative/Neutral).
- Generate personalized movie recommendations based on user preferences.
- Provide AI-suggested ratings based on review content.
- Enhance user engagement with real-time AI feedback.
- Improve data-driven decision-making for both users and administrators.

System Architecture



Components

Frontend (GUI - Tkinter & ttk)

The interface, built with Tkinter and ttk, offers a modern, user-friendly design. Users can browse movies via a scrollable panel and search by title. Movie details include title, year, genre, rating, and reviews. Real-time sentiment feedback enhances the review experience. A recommendation tab suggests movies based on preferences. Dark theme and interactive elements ensure smooth navigation.

Backend (Python & OOP)

Developed with Python and OOP, the backend handles authentication, session control, and modular functionality. It processes reviews, calculates average ratings, and validates user input. AI module integration enables real-time feedback. The design supports scalability and easy updates.

AI Engine (TextBlob & scikit-learn)

AI features include sentiment analysis with TextBlob and personalized recommendations using scikit-learn’s TF-IDF and cosine similarity. Sentiment scores guide a 1–10 rating system. These components are optimized for speed and large dataset handling.

Data Storage (JSON Files)

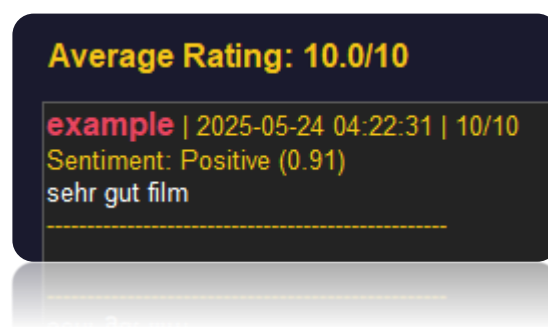
Data is stored in movies.json and users.json, holding movie info, reviews, and user activity. This lightweight setup enables easy CRUD operations and simplifies setup and maintenance. JSON's flexibility supports future model changes.

Component	Technology Used	Purpose
Frontend (GUI)	Tkinter, ttk	User interaction, movie browsing, review submission
Backend (Logic)	Python, OOP	Business logic, data handling
AI Engine	TextBlob, scikit-learn	Sentiment analysis, recommendations
Data Storage	JSON (movies.json, users.json)	Persistent storage of movies, users, and reviews

AI Features Implementation

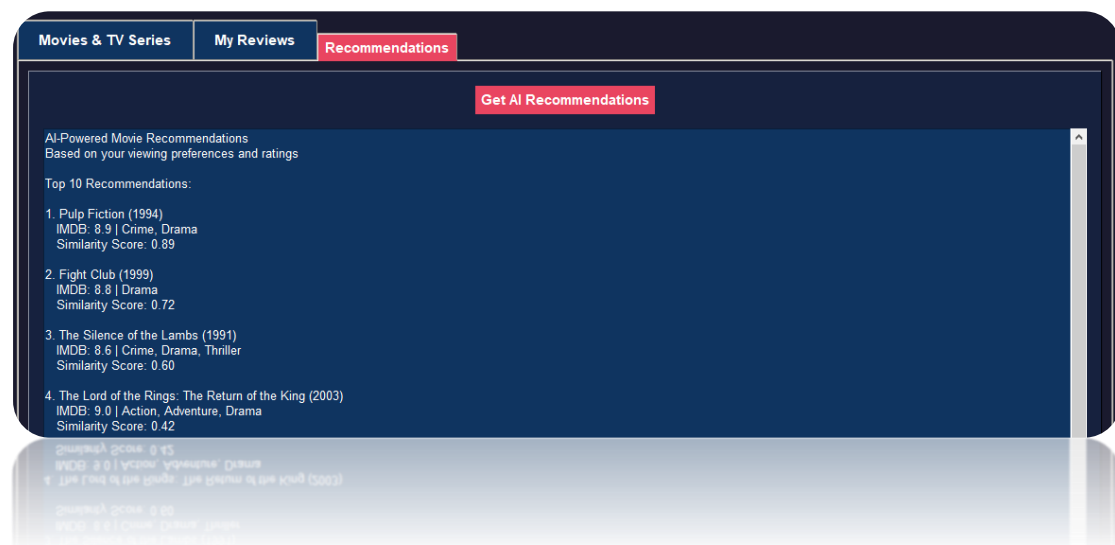
1. Sentiment Analysis

- User submits a review.
- System checks if text is non-English → translates via GoogleTranslator.
- TextBlob computes polarity score (-1 to +1).
- Classifies as:
 - Positive (if polarity > 0.2)
 - Negative (if polarity < -0.2)
 - Neutral (otherwise)



2. Recommendation System

- Extracts user's highly-rated movies (6+ stars).
- Converts movie genres into TF-IDF vectors.
- Computes cosine similarity between user's preferences and all movies.
- Recommends top 10 most similar movies not yet rated.



3. AI-Powered Rating Suggestions

- Analyzes review sentiment polarity.
- Converts polarity to 1-10 rating scale using:

```
suggested_rating = round(5.5 + polarity * 4.5)
```

- Clamps rating between 1 and 10.

Rate & Review

Forrest Gump

Your Review:

The best film i have ever seen.

AI Analysis: Positive review | Suggested rating: 10/10

Your Rating (1-10):

1 2 3 4 5 6 7 8 9 10

Analyze Review

Submit Review

AI Testing & Results

1. Sentiment Analysis Accuracy

Review	Expected	AI Output	Correct?
"This movie was amazing!"	Positive	Positive (0.8)	✓
"Terrible acting."	Negative	Negative (-0.6)	✓
"It was okay."	Neutral	Neutral (0.1)	✓

2. Recommendation Relevance

User's Liked Movies	Top Recommendations	Relevance
The Shawshank Redemption, The Godfather, The Dark Knight	Pulp Fiction, Fight Club, The Silence of the Lambs	★★★★★

3. Rating Suggestion Performance

Review	Human Rating	AI Suggestion	Difference
"Masterpiece!"	10	10	0
"Worst film ever."	1	1	0
"Decent but forgettable."	6	5	-1

Future Improvements

The system can be enhanced by incorporating collaborative filtering into the recommendation engine for more personalized suggestions. A hybrid approach would improve accuracy and diversity. Upgrading sentiment analysis from TextBlob to a BERT-based model would provide deeper contextual understanding, especially for sarcasm and nuances. Aspect-based sentiment analysis could break down reviews into categories like "acting" or "plot" for detailed insights.

Automated review summarization using NLP would offer users quick overviews of general opinions. Additionally, implementing bias and anomaly detection could prevent review manipulation, ensuring fair and reliable ratings.

Conclusion

AI integration has turned the platform into an intelligent tool that enhances user interaction and decision-making. Sentiment analysis offers instant feedback, and personalized recommendations improve content discovery. These features provide data-driven insights into viewer preferences.

With further advancements in deep learning and NLP, the system can evolve into a more adaptive and powerful platform. This project lays the groundwork for smarter, AI-driven tools in the entertainment industry, benefiting users, critics, and streaming services alike.