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Movie Recommendation based on Emotions

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ABSTRACT: This paper presents a novel movie recommendation system that aligns movie genres with user emotions to provide personalized suggestions. By leveraging a genre-to-emotion mapping strategy, the system offers recommendations that reflect users' current emotional states. Developed using Python and Streamlit, the application visualizes emotion-based distributions, simulates classification accuracy, and allows interactive exploration, enhancing user engagement in selecting mood-aligned entertainment.

KEYWORDS: Movie recommendation, emotion-based filtering, genre mapping, Streamlit, user personalization.

I. INTRODUCTION

With the growing volume of digital media content, personalized recommendation systems have become essential for enhancing user experience. Traditional movie recommender systems rely heavily on user ratings and viewing history. This paper proposes an alternative approach that emphasizes emotional alignment between users and content by mapping movie genres to emotional states. This allows for a lightweight, user-friendly system that can be used without login or complex data collection. Modern users increasingly seek content that resonates with their emotional state, especially in the context of movies and entertainment. Recognizing this demand, emotion-based recommender systems have emerged as a promising direction for improving user satisfaction and engagement. Emotional context not only adds a new layer of personalization but also addresses limitations in traditional models that overlook user moods or contextual cues.

II. LITERATURE SURVEY

Recent years have witnessed considerable progress in the development of recommender systems. most traditional methods focus on collaborative filtering and content-based approaches, where user preferences and item attributes are matched to generate recommendations .collaborative filtering methods, such as matrix factorization and neighborhood models, are widely used but suffer from cold-start and sparsity issues. Content-based filtering overcomes these issues by leveraging item metadata but often lacks diversity in recommendations. Hybrid systems combining both strategies have also been explored .

Emotion-aware recommender systems represent a growing subfield. These systems incorporate affective information, such as emotional states inferred from user interactions or context, to tailor suggestions more personally. Techniques involve sentiment analysis of social media content, facial expression recognition, and physiological .

III. METHODOLOGY

1 Dataset The dataset consists of a collection of movies with associated genres, loaded from a CSV file. A mapping function assigns an emotional label to each movie based on its genre. The dataset is preprocessed to ensure consistency and completeness, including removing duplicates and handling missing values. An important step involves mapping each genre to a corresponding emotional category using a predefined function. This simplified genre-to-emotion mapping allows the system to categorize and recommend movies based on emotional relevance. By transforming genre labels into emotion tags, the dataset becomes an emotion-labeled collection that supports personalized recommendations.

2 Genre-to-Emotion Mapping Genres are mapped to emotional states as follows:

- Comedy → Happy
- Drama → Sad
- Thriller/Action → Excited
- Romance → Love
- Others → Neutral

3 User Interface Built using Streamlit, the interface includes:

- An emotion selector on the sidebar
- A recommendation output based on selected emotion
- A visual representation of emotion distribution across the dataset
- Simulated confusion matrix and classification accuracy to mimic a machine learning evaluation

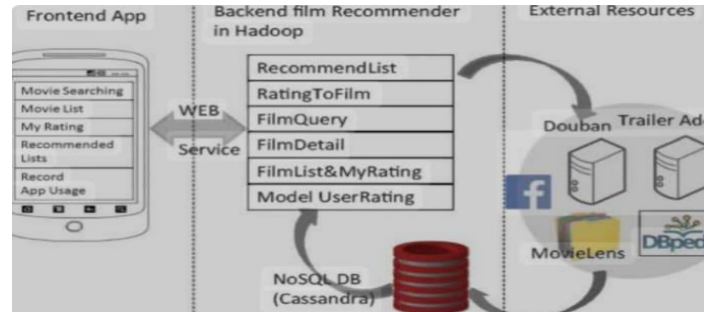
4 Recommendation Logic The application filters the dataset to return movie titles that match the selected emotional state. This filtering is implemented with a simple equality check on the mapped 'emotion' column.

IV. RELATED WORK

Recommender systems have historically focused on three main approaches: collaborative filtering, content-based filtering, and hybrid models. Collaborative filtering makes use of user-item interaction data to recommend items to users based on the preferences of similar users. Despite its effectiveness, collaborative filtering suffers from sparsity and cold-start problems [1]. Content-based filtering uses item features (e.g., genres, tags) to recommend similar items to those the user has liked in the past but may result in limited novelty.

V. ARCHITECTURE

- 1. User Interface (UI):**
 - Developed using Streamlit, the web-based interface allows users to select their current emotional state.
- 2. Data Processing Module:**
 - Loads and cleans the movie dataset.
 - Applies genre-to-emotion mapping to categorize each movie entry.
 - Prepares filtered datasets based on user-selected emotions.
- 3. Recommendation Engine:**
 - Filters movies based on the selected emotional label.
 - Displays top matching movie titles dynamically.
 - Designed to be lightweight and interpretable, using rule-based filtering logic.
- 4. Visualization Engine:**
 - Generates emotion distribution plots using Seaborn and Matplotlib.
 - Simulates classification performance through random predictions to demonstrate model evaluation capability.
- 5. Evaluation Module:**
 - Uses Scikit-learn to simulate a confusion matrix and accuracy metrics.
 - Intended for future enhancement using real classifier models for emotion prediction.



VI. CONCLUSION

This project demonstrates a lightweight, emotion-based movie recommendation system with a clean, interactive interface. While the current implementation uses static genre-emotion mapping, it opens avenues for future enhancements such as:

- Integrating real-time sentiment analysis from user input
- Using natural language processing to auto-map genres to emotions
- Training a supervised learning model for emotion classification

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