

FILM SAGA – A MOVIE RECOMMENDATION SYSTEM USING MACHINE LEARNING

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ABSTRACT

Technically nowadays there is a rapid widening when it comes to the field of Data Science, Machine learning, Deep learning and Artificial Intelligence. Data acquisition is more efficient through the recommendation systems. The Recommender engines or recommendation systems are the major wing of Data Analytics, Machine learning algorithms and Artificial intelligence which is conducted by the software engineers to improve the quality of searching results and predicts the users' ratings / rankings on a particular item/ product or commodity, then offers relevant recommendations to the users and returns back the user's preferences. These recommender systems entice users with enhanced experience and pure joy. In this project work is a Movie recommender system is built by loading the datasets from Kaggle Website, then various filtering algorithms like demographic filtering, Content-based filtering, emotion / mood-based filtering through web scraping methodologies are used which makes recommendations based on the users' preferences, rating, genre, matching the terms, experiences, emotions, popularity and collects information to eventually extract the final movie recommendation systems. In this project both personalized (user specific) and non-personalized (common) recommendations are processed. Furthermore, the output is extracted through the Flask Micro Web framework written upon python programming to develop the web application and then its transformed into a Mobile application through the React front-end JavaScript for user Interfaces/ User experiences (UI/UX) for the recommender system.

I. INTRODUCTION

The Evolution of Entertainment has been the favoured subject matter from ages through varied forms like theatre, films, radio, podcasts, Television and then other digital devices overtakes everything making all sources available through OTT (Over The Top) providing television, film, web series and documentaries as contents over the internet on users request and predicts the source of entertainment based on preferences, emotions, popularity, genre, repetitions, similarities and recommends individual consumers choice on various aspects of preferences. For instance, YouTube, Netflix, Tinder, Amazon Prime.

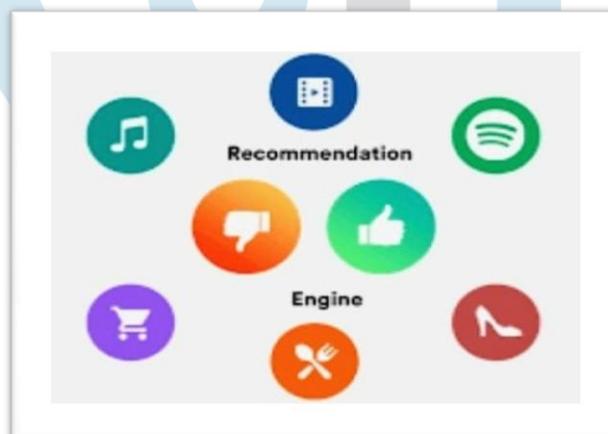


Figure: Recommendation Systems.

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II. LITERATURE SURVEY

Recommendation systems are one sort of information gathering and filtering mechanisms which makes the search engine to improve and provides more relevant / related items to the user's preferences. These systems are designed to predict the user's opinion they can have on any product or commodity based on previous searches.

Previous works on Recommendation Systems:

1. Recommendation System with Hybrid systems: In this paper the system uses hybrid recommender systems to use contextual information and ratings of the users. It makes improvements on user's ratings.
2. Video Games Recommendation Systems: It recommends the games for users based on their searches and likes which they can browse and purchase the games they like and play.

3. Diet Recommendation System: This system is designed for recommending the proper diet/ food for patients based on their age, weight, calories, proteins, sodium, fat by the implementation of machine learning and deep learning concepts like RNN, MLP etc
4. Articles Recommendation System: It recommends the articles for the readers based on their content, reading habits, genre and categories based the content and collaborative filtering methods of machine learning concepts.
5. Tinder: An Application which gives recommendation for users about the similarities, likes, dislikes, common grounds and preferences in different sectors based on machine learning and deep learning concepts to get user's perfect match for dating.
6. Netflix/ Amazon prime/ Hayu: All these application gives the users the with different recommendations on Movies, Television shows, Documentaries and web series etc based hybrid recommendation systems.
7. Make my Trip: The Tourist places recommendation guide which plans the tours, makes recommendation based the budget, interests, previous places visited. These Apps will also recommend local places and food to new travellers.
8. Facebook: Facebook recommends the mutual friends, posts and similar interests that people like and want to expand their business through social media to reach out to many people.

Different Types of Recommendation Systems

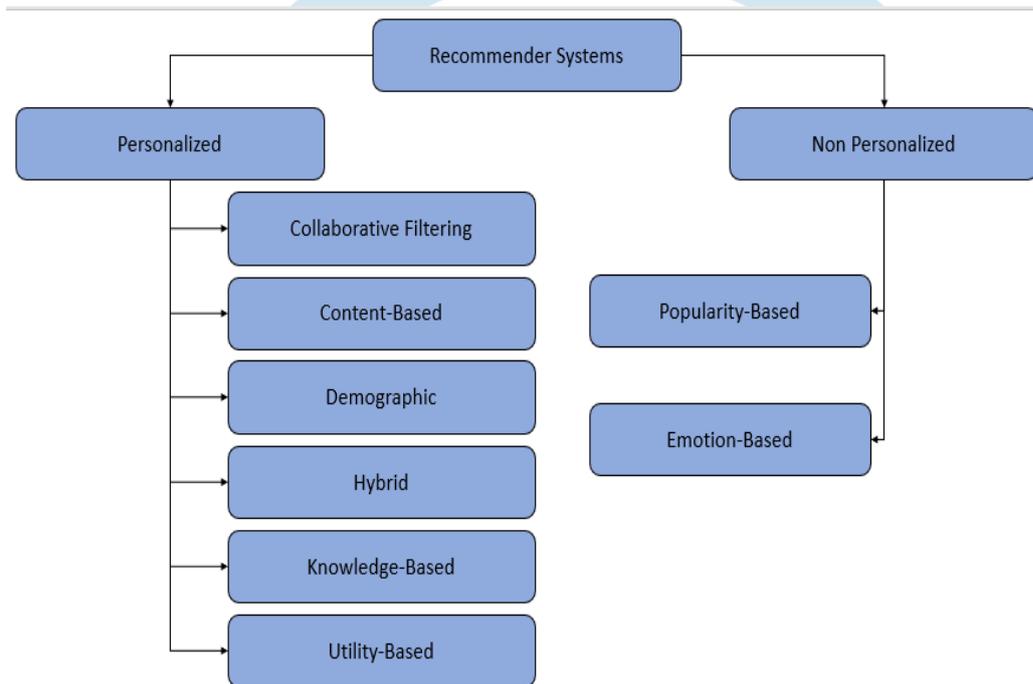


Figure: Different Types of Recommender Systems

III. PROPOSED SYSTEM: MOVIE RECOMMENDATION SYSTEM

The proposed method of movie recommendation system using machine learning contains major steps.

Step 1: To Download the datasets from Kaggle: Kaggle permits users to identify and produce data sets and generate various models on the platform where large datasets are put use by researchers/ analysts to explore more about different fields and widen our knowledge.

Step 2: To get General recommendations for all the Users: General recommendation is as the name suggests, similar to every Users/ Customers based on weighted average.

Step 3: To get Unique recommendations for all the Users Individually: Personalized recommendations are uniquely designed for each and every user with their choice and preferences.

Step 4: To get Mood-based recommendations for all the Users: Emotions-Based recommendation is as the name suggests, finds the users mood by their inputs and specifically suggest the items/ product.

Step 5: To create the Python programs to get these recommendations: The Recommendations and rendered on the local host through the Flask web micro framework which helps to link the data upon the python programs.

Step 6: To visualize the Output: The result contains general, users specific and emotion-based outcomes based on the hybrid filtering model.

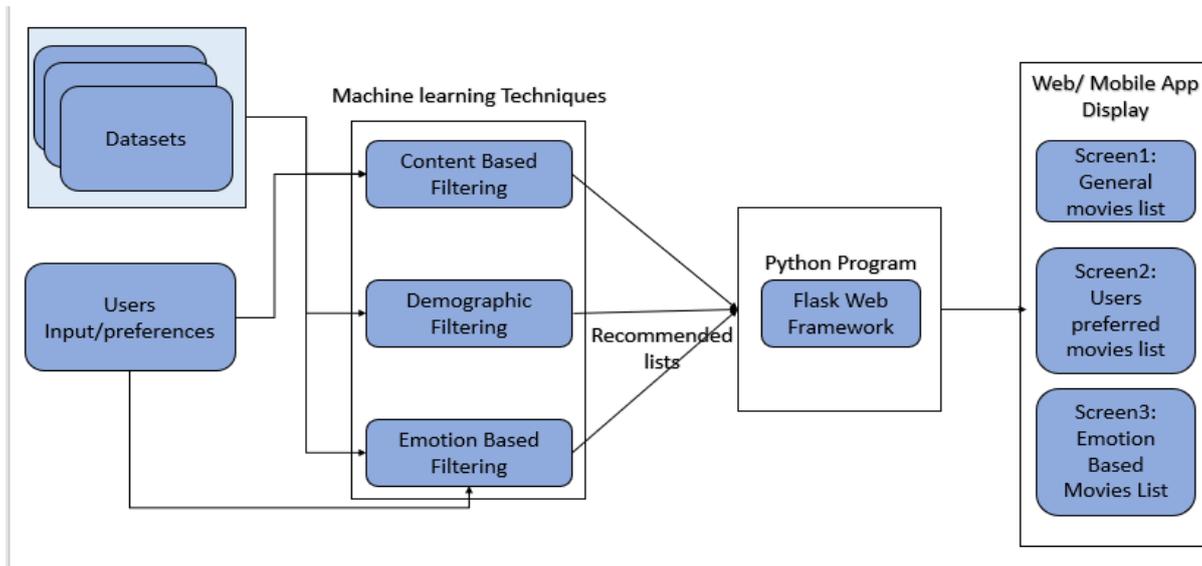


Figure: Proposed Movie Recommender Systems

System analysis is the backbone for the movie recommendation system. The undertaking of study on the various activities in order to identify its purposes and provide system that will produce the output/ recommendations in a sophisticated manner. It contains the following steps:

Designing the python program to recommend movies based on the user preferences, emotions/moods and general popularity-based systems

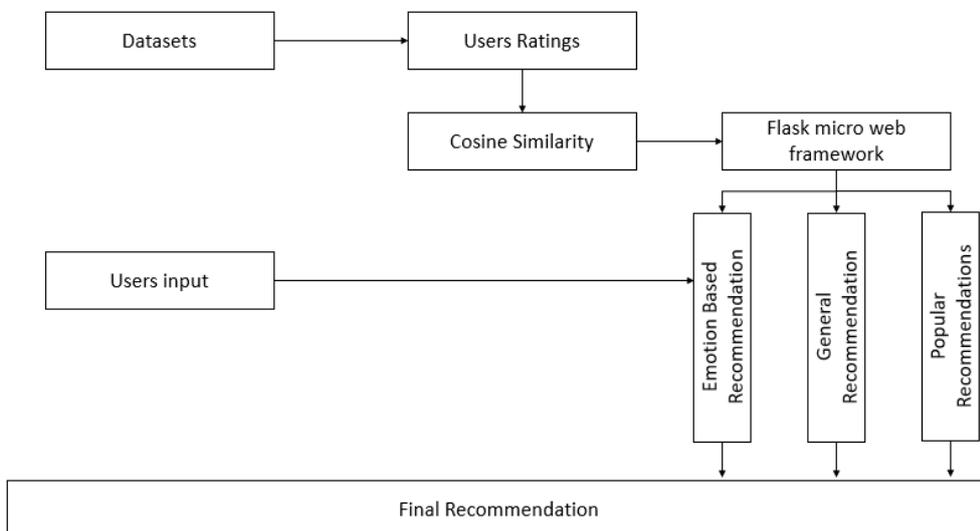
The datasets are loaded from Kaggle and processed through the various recommendation filtering methods to obtain the data which has movies list and suggests the movies based on demographic filtering for all the users as popular data, users inputs are taken in for emotion based recommendation and then the system gives recommendation based on content based filtering for any users preferences such as liked movies list, unlike movies list did not watch list so that it can enhance the recommendation.

Design the Flask web framework on python program to create API's for getting recommendations

To create API's request to get the data on the local host and load those links on thunder client to post requests and load the response as JSON format for both get and post methods for all movies list, liked movies list, unlike movies list and not watched movies list completely on users own preferences and updates.

Design the Web/ Mobile Application by using React Native JavaScript

To display the recommendations that we extracted through the python program and machine learning algorithms on the screen as an output and design the front-end display of the application through React Native JavaScript.



IV. CONCLUSION

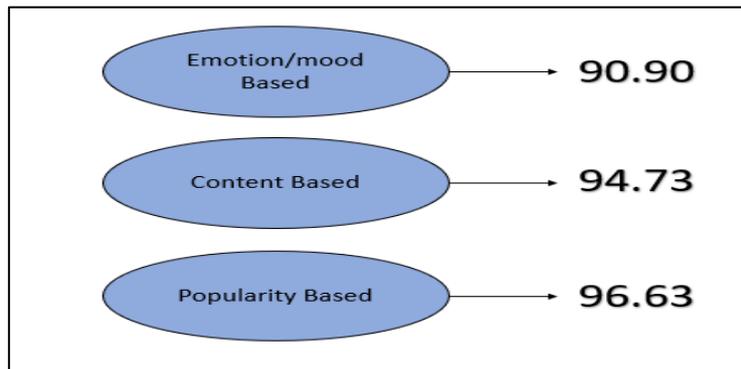


Figure: Final Outcome of Performance analysis

PA Methods	True positives	True negatives	False positives	False negatives	Precision	Recall	F1 score
Emotion Based	5	4	1	0	0.833	0.100	0.909
Content Based	27	11	0	3	0.100	0.900	0.9473
Popularity based	72	14	1	4	0.9863	0.9473	0.9663

Table: Precision, recall and f- measure of performance analysis

A Recommender System is an information provider system which connects the users and products. It basically helps the users to get the recommendation based on broad category of choices. The deliverer of the system needs the app to be used by many users so that it can be popular. Recommendation systems have their resources in a various area of research, including information retrieval, information extraction, data manipulation, text classification, etc. These systems use various methodologies such as machine learning, deep learning, data mining and other wide range of techniques including algorithms, collaborative and hybrid methods, and precision methods.

Our project work is a Movie recommender system is built by loading the datasets from Kaggle Website, then various filtering algorithms like demographic filtering through weighted rating calculation and the quantile function then, we used Content-based filtering for user preferences through the cosine similarity checks for cast, crew, genre and unique keywords then we moved towards the emotion / mood-based filtering through web scraping methodologies are used which makes recommendations based on the users' preferences, rating, genre, matching the terms, experiences, emotions, popularity and collects information to eventually extract the final movie recommendation systems. In this project both personalized (user specific) and non-personalized (common) recommendations are processed. Furthermore, the output is extracted through the Flask Micro Web framework written upon python programming to develop the web application and then its transformed into a Mobile application through the React front-end JavaScript for user Interfaces/ User experiences (UI/UX) for the recommender system.

The evaluation and performance analysis were carried out through the precision, recall and f1 measure formulae which initially was manually evaluated for each and outcome and then created a table which shows the Predictions and outcomes approximately equivalent to 90 % equivalent to emotion-based suggestions then, approximately equivalent to 94 % equivalent to Content-based suggestions and finally highest percentage that is, 96% through the demographic filtering suggestions.

V. SCOPE FOR FUTURE WORK

1. Recommender systems may help in increasing their sales through E-commerce sites.
2. Facial Mood Detection of the users can be added for the Application through image processing and deep learning.
3. We can increase the precision and make our recommendation more relative and personalized.
4. Multiple factors can be taken as an entity at a single time to predict the similarities.
5. Relevant movies/ related information and reminders can be updated through the app and remind to stream at a particular date and time.
6. We can send the emails, messages and update flashes through the social media.
7. Restrictions on some contents can be automatically added based on users' information like age, usage timing, and interested category.
8. Maintainability can be increased to hold a lot of movies data at recommend through the app.
9. New gestures can be installed on the Application.
10. More contents can be added which can be helpful for students to explore and learn different fields.
11. Security and privacy of the users should be the amin concern while we are updating the new features and contents on the app.
12. The memory capacity should be increased so that the system loads the data and its rating for longer period without any data loss.

VI. REFERENCES

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