

Movie Recommendation System Using Rest API and Sentiment Analysis

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Abstract— Finding useful information is becoming increasingly difficult as the Internet grows at a quicker rate. Information or content can take any form that users find appealing, such as music, video, photos, or text. As a result, recommendation algorithms come into play. Recommendation systems are a type of information filtering system that assists people in locating products, accurate information, and even other people. Books, news, articles, music, videos, and movies are among the most prominent domains where recommender systems are used. We suggested a movie recommendation system based on a content-based filtering strategy that takes the information provided by users, analyses it, and then suggests the movies that are most suited to the user at that time.

Keywords—Recommender Systems, content based, Collaborative filtering, similarity, movie.

I. INTRODUCTION

Recommendation systems are crucial in information filtering systems because they determine how best to recommend things or information that are relevant to the user. A recommendation system, also known as a recommender system, can be used in a variety of situations. Recommender Systems make recommendations, which the user can accept or reject, as well as providing implicit or explicit feedback, either immediately or afterwards. Users' actions and feedback can be saved in the recommender database, which can then be utilized to generate new recommendations in subsequent user-system interactions. The user experience is enhanced with high-quality tailored recommendations. Recently, web-based personalized recommendation systems have been used to deliver numerous forms of personalized information to their users. These are the systems in place. These systems can be applied in various types of applications and are very common now a day. We can classify the recommender systems in two broad categories :-

- Collaborative filtering approach
- Content-based filtering approach

II. LITERATURE SURVEY

[1] A Movie Recommendation System Research Paper:-

In this study, we present a review of the relevant literature that employs a variety of methodologies to make various

recommendations systems. Collaborative filtering is classified in this study utilizing several methodologies such as matrix factorization, user-based recommendation, and item-based recommendation. This survey also provides a roadmap for future research in this field. Several strategies for making movie suggestions have been intensively researched during the last few

decades. A recommendation system based on the ALS algorithm, a recommendation based on the weighting technique, and collaborative filtering based on item similarity are some examples. These strategies necessitate prior knowledge of the user-generated movie ratings. For the most part, movie lens datasets are used to evaluate these approaches. These systems, however, are not entirely accurate, and research is ongoing to improve them.

[2] Research Paper On Different Techniques Of Recommendation Systems using the rating and similarity among the two users:-

The system recommends an item to the user for the decision making. Then separate the movie data set into an unrated and rated sample set with the help of the KNN model. It can recommend the movies to the unseen users via user registration information, and it can create new and not popular movie recommendations according to the film's history and score. The database in this approach is the MYSQL database.

[3] A Content-Based Filtering Research Paper:-

CBRS (content-based recommendation system) suggests things to the user based on their previous purchases. In order to give relevant information to the user or buyer, a user profile with traits and features of the objects must be developed utilizing online usage mining or information retrieval methods. The similarity of the materials the user is interested in is used to filter things in the content recommendation system. It suggests or analyses goods based on high-rated items that are comparable to the user's preferences. Documents with textual information, websites, and other applications of content-based recommendation

[4] Sentiment Analysis-Based Research Paper:-

People rely on knowledge to decide their interests therefore the recommendation system is ingrained in their daily lives. The collaborative filtering methodology uses information from a user's previous actions (for example, previously purchased things or numerical ratings given to them) as well as similar judgments made by other users. Following that, several models are employed to predict which products (or ratings for objects) the user might be interested in. Despite the fact that there have been numerous approaches created in the past. Search, on the other hand, continues to exist since it is widely employed in many applications that customize recommendations and cope with inaccuracy. These requirements present considerable difficulties.

[5] K-Means Algorithm-Based Research Paper:-

We choose K initial centroids in the K-means clustering algorithm, where K is the desired number of clusters. The cluster with the nearest mean, i.e. the cluster's centroid, is then assigned to each point. The centroid of each cluster is then updated based on the points allocated to the cluster. We continue the operation till the cluster centre does not change (centroid). Finally, the goal of this technique is to minimize an objective function, in this case, a squared error function.

[6] Utility-Based Recommendation System Research Paper:-

A utility-based system is a function that expresses the degree to which someone is happy. It calculates the usefulness of each attribute of the user to recommend things and determines the users contentment. The user profile is the system's derived utility function for the user, and the system uses constraint satisfaction techniques to find the best match. The advantage of utility-based recommendation is that it may incorporate non-product qualities like vendor reliability and product availability into the utility calculation, allowing users to trade off price versus delivery schedule for example. The disadvantages of the new user problem, data sparsity, are alleviated using utility-based techniques. It also determines the users satisfaction and makes computation based on utility of each attribute of the user to recommend items. This technique can be applied to applications where short term goals need to be achieved.

III. EXPERIMENTAL SETUP

Our user will enter name of the movie they have watched or like to get information for that movie. Our web app will display all information about the movie along with the poster, reviews, names of the top casts also we will get some user reviews and perform sentiment analysis on that. At last we will have the recommended list of movie based on the movie entered by the user. User can click on the list of casts to get some basic details on them, also user can click on the recommended movies to get more info on that movie which again will give us list of recommended movies for the movie user clicked

IV. EXPLANATION OF PROPOSED SYSTEM

I. PROPOSED SYSTEMA BLOCK DIAGRAM

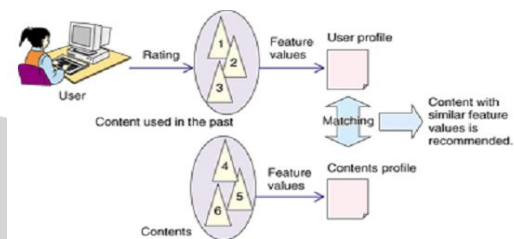


Fig. 1 Proposed System

We are going to Perform Exploratory Data Analysis (EDA) on the data Gathering the appropriate data for the model. Build the Movie Recommendation System Testing the model on different parameters. Get recommendations for the movies. Build a web site for deployment of the model and integrate the same using flask /Django so that it can interact with the model. Lastly Testing and improvement will be done.

(i)We're employing the cosine similarity approach, which is commonly used for movie recommendations. Sentiment Analysis is then performed utilising the Nave Bayes (NB) A movie title is now used as an input to the movie recommendation model, which predicts comparable films. The movie's reviews are acquired via web scraping from the IMDB site and passed to the Sentiment Analysis model for classification as positive or negative. The Cosine Similarity technique is utilised in Python using the sklearn module. In cosine similarity, vectors are used as data objects in data sets, and the similarity is calculated by defining them in a product space. The greater the similarity, the smaller the distance; yet, the greater the distance, the lower the

$$\text{Cos } \theta = \frac{\vec{a} \cdot \vec{b}}{\|\vec{a}\| \|\vec{b}\|} = \frac{\sum_1^n a_i b_i}{\sqrt{\sum_1^n a_i^2} \sqrt{\sum_1^n b_i^2}}$$

similarity.

The angle between two vectors determines Its direction and is measured in 'θ'. This angle θ can be calculated by

using above equation When $\theta = 0^\circ$, the 'x' and 'y' vectors overlap and prove to be similar. When $\theta = 90^\circ$, the 'x' and 'y' vectors are therefore dissimilar.

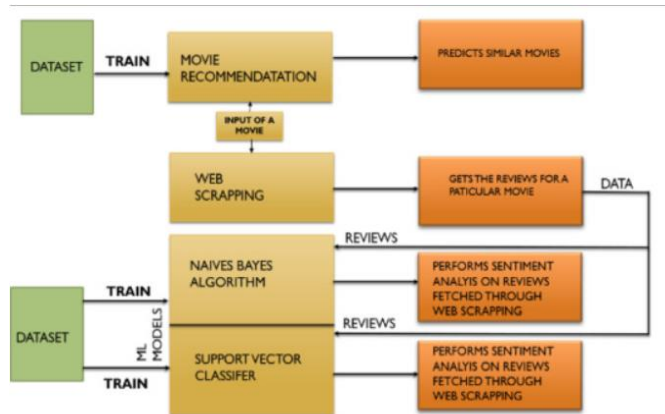


Fig. 2 Flowchart of proposed method

The NB Algorithm uses conditional probability to classify the given data set. Bayes theorem is used for the computation and used class levels represented as feature values or vectors of predictors for classification

$$P(A|B) = \frac{P(B|A)P(A)}{P(B)}$$

This equation calculates the conditional probability of event A such that B has already occurred and this is used to for calculation in the NB classifier. Types of models under NB algorithm

Gaussian

Multinomial

Bernoulli

The multinomial NB model is used in the proposed system to predict the badge of a text, such as an email or a newspaper article. For a given sample, the likelihood of each badge is determined, and the badge with the highest probability is produced. This algorithm was an excellent choice for sentiment analysis of movie reviews because it is primarily utilised for natural language processing and text data analysis.

ii) Creating a RESTful API Using Flask

We create an instance of this class. The first argument is the name of the application's module or package. We then use the route() decorator to tell Flask what URL should trigger our function. In this case, we use the /movie endpoint with the base URL. We define a function which will be used to return recommendations. In this line, we call the get_suggestions function and store the recommendations in a variable named suggestions. We run the app after our application.py file is called directly in the terminal/command prompt. We set our port number to 8080 when running on localhost and we set debug=True to trace back any errors that occurs whilst running our application.

V. CONCLUSION

This paper is broken into two primary sections. One focuses on a movie recommendation system, while the other is concerned with sentiment analysis. The research examines both systems in depth and draws some crucial conclusions. The Cosine Similarity algorithm has been used in the Movie Recommendation System to recommend the best movies that are relevant to the movie submitted by the user based on multiple characteristics such as the movie's genre, overview, cast, and ratings. Even after multiple testing, Cosine Similarity has shown reasonable results and has been pretty accurate in selecting movies. In this study, sentiment analysis is also significant. Its primary goal is to categorize evaluations as good or negative. While conducting sentimental analysis, one difficulty is the linguistic barrier. Only reviews written in English may currently be examined. If the reviews are sarcastic or humorous, the Sentimental analysis incorrectly classifies them.

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