Research Article

Movie Recommendation System

Aditi Bhatt[a], Shubham Maddhesia[b], Prakhar Gupta[c]

[a] Computer Science And Engineering, Galgotias University, Greater Noida, India,
aditi17.bhatt@gmail.com
[b] Computer Science And Engineering, Galgotias University, Greater Noida, India,
shubhamkr.master@gmail.com
[c] Computer Science And Engineering, Galgotias University, Greater Noida,
guptaprakhar019@gmail.com

Abstract

The tremendous measure of information accessible on the Internet has prompted the improvement of suggestion frameworks. This task set forward the utilization of figuring procedures to create proposal frameworks. It shows the imperative of current calculations used to carry out suggestion frameworks, assessment of test results, and end. The System would profit those clients who need to utilize web crawlers to find pertinent substance. They need to go through pages of results to discover fitting substance. Able suggested motion pictures for guaranteed.

The objective of this task is to consider recommendations engines and recognize the deficiencies of customary recommendations engines and build up a proposal framework.

Keywords: Online Recommendation System, Movie Recommender, Movie Recommendation System, Collaborative Filtering, Content-based Filtering

1. Introduction

In today's time web is important part of our lifestyle, the people around the world facing problem of selecting a particular thing over other due to the great range of options available on the net. There is a big amount of data available over the web. So to help people to deal with this problem of vast information available on the web company's has use recommendation system for managing and dealing with their user across the world. The study and research in this zone of recommendation has been started from very long time however the undivided attention is still there because of vast amount of application and the issue of vast domain.

Recommender are put to use for giving customized recommendations build on their foregoing actions. Recommenders like Amazon Netflix and YouTube generally employ in the Internet industry. Recommendation system in general help people in selecting a particular thing from vast amount of information available on the net. In that similar way a movie recommended system will give a level of ease and customization that help people to link better with system and Consider the movie that well match with their interest. The aim of our system is to recommend movies to Its user Based on the review and rating they have provided. The system will recommend the product to the distinct user based on the type of movies they usually prefer. Collaborative and content-based filtering are major way in providing recommendation to the users. These filtering are best applicable in particular scenarios because of their properties. In this paper We are going to see how these both algorithms improve execution and accuracy towards system and make the system work better

2. Literature Review

Recommender systems are more well known and increment the creation costs for some specialist service providers. These days the world is an over-full so the suggestions are needed for suggesting items. However recommender system limit the transaction costs and improves the quality and decision making process to clients. It is applied in various neighboring areas like information retrieval or human computer interaction (HCI). It gathers enormous amount of information about client's preferences of several things like online shopping products, movies, taxi, TV, tourism, restaurants, etc. It stores information of diverse ways either positive or negative manner. It catches the client's audit for watched films, voyaged puts, and bought items. When compare demand from the shopping products, service providers (travel, and restaurants), movie recommendation system plan a large problem since other recommendation frameworks require fast computation and processing service from service providers and product distributors. To recommend movies, first collects the ratings for clients and then recommend the top list of things to the target client. In addition to this, clients can check surveys of other clients before watching movie. A distinctive recommendation schemes have been presented includes collaborative sifting, content-based recommender system, and cross breed recommender framework.

3. Feasibility Analysis

Financial feasibility: The model is more affordable as we accumulate data from various film raters which will be allowed to get to. A huge staff is additionally not needed as the product just requires essential ideas to chip away at.

♦ Resource feasibility: The model is primarily dependent on large data sets. So, having large resources will maximize the effective results.

4. Proposed Model

We will construct a Movie recommendation system with different methodologies and with each progression, we will get further developed and improve the nature of the ideas made by the proposed framework to show up to 16 characters in two characters
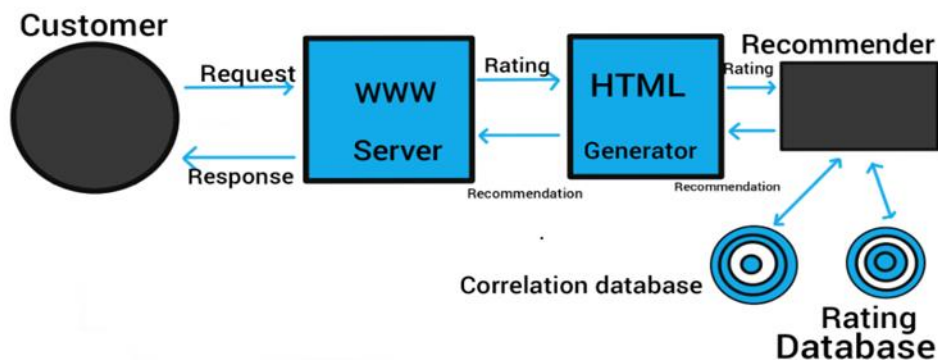
A. Content-Based Recommendation System:

This approach for recommending movies does not involve other clients. On Basis of what we like, our algorithm will take same sort of things and will recommend us.
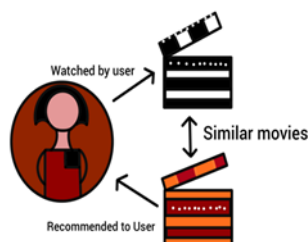
Here, the variety in recommendations will be least as it examines what the client loves. E.g, A client who like Horror movies will only be recommended other horror movies until they attempt some other sort autonomously and decide to give it a like.

Algorithm used :

COSINE SIMILARITY

In order to pick same content, we use cosine similarity algorithm. It measures similarity between two vectors by calculating the cosine of the angle between them.

General formula used to calculate the dot product is:

$$similarity = cos(\theta) = \frac{u \cdot v}{\|u\| \|v\|} = \frac{\sum_{i=1}^{n} u_i v_i}{\sqrt{\sum_{i=1}^{n} u_i^2} \sqrt{\sum_{i=1}^{n} v_i^2}}$$

B. Collaborative Filtering Recommendation System :

The first method didn't include other users so it had some disadvanatges. These limitations involve the recommendations not being diversified. To solve these issues we use the collaborative filtering technique. This method uses the idea that the user rates, and the system recommends different movies which the user has not watched but the others who are similar to the test user have watched and liked. This is called as the User-to-User Collaborative filtering approach where we discover same kind of users.

To check whether both the users are similar or not, we take into account the movies watched by both and how each of them rated. Thus by checking only the common items, we can predict the ratings a user will give to a movie who hasn yet to watch it, based on its similar user rates.
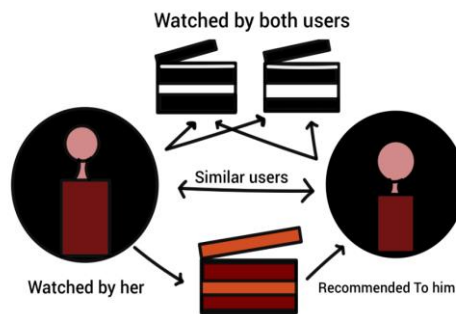

Algorithms Used:

i. K Nearest Neighbors:

The method of Collaborative Filtering is known

as Nearest Neighborhood algorithm. We take a $n \times m$ matrix of rating, with user u_a, $a = 1, ...n$ and item p_b, $b=1, ...m$. Now we need to predict the rating r_{ab} if target user a did not rate/watch an item b. Then calculate the similarities between target user a and all others, select the top X similar users, and take the average of ratings from the X users with similarities as weights.

$$r_{ij} = \frac{\sum_{k} Similaries(u_i, u_k) r_{kj}}{number\ of\ ratings}$$

$$r_{ij} = \bar{r}_i + \frac{\sum\limits_{k} Similaries(u_i, u_k)(r_{kj} - \bar{r}_k)}{number\ of\ ratings}.$$
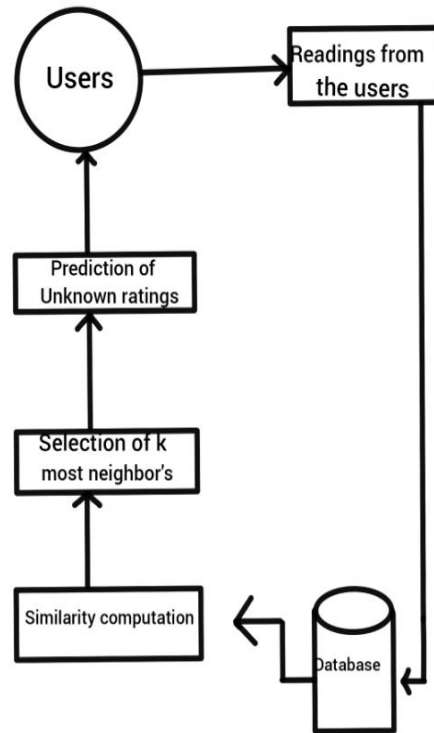
The architecture of Movie Recommendation System

ii. Matrix Factorization

Insufficiency is a major issue which needs to be taken into account while making collaborative filtering recommendation systems. Our method creates matrices where rows represent unique users in the environment and the columns are different movies and the values are the ratings given by users to the movies. Though, movies will be rated by every user. Thus our matrix faces the issue of insufficiency which needs to be solved. For this we use Matrix Factorization. Here, the original sparse matrix is decomposed to low-dimensional matrices with latent features. Therefore this gives us how much a user is oriented with a set of hidden features, and how much a movie fits into this set of hidden trait.

Merit of Model

1. They are equipped for suggesting unrated things.
2. We can undoubtedly clarify the working of the recommender framework by posting the Content highlights of a thing.
3. Content-based recommender frameworks use need just the rating of the concerned client and no other client of the framework.
4. Improve expectation quality.
5. Better effectiveness and versatility.
6. Improve speed and accomplish better execution..

5. Process Conceptualized In Steps

i. Movies are rated by users.

ii. A matrix is created with user, movies and the respective ratings.

iii. Insufficiency of matrix is dealt.

iv. Pearson Correlation or Cosine similarity algorithms finds the Similar users to our target user.

v. Ratings of movies are predicted by comparing them with other similar users.

vi. Hidden features can be compared and used for recommendations.

vii. Probability of ratings are determined by passing these predictions through neural network embeddings.

viii. Highest probability ratings are chosen and allocated to new movies which the target user has yet to watch.

ix. Drew on the assigned ratings whether it is marked or not to recommend the movie to our user.

6. Conclusion

The situation of vast information available on the web, has increased the demand of recommender and so for the movie the requirement of movie recommendation system increasing. This paper shows the implementation of movie recommendation system working on collaborative algorithm, content based and KNN algorithm.

References

[1] M. J. Pazzani and D. Billsus, ''Content-based recommendation systems,'' in The Adaptive Web. Berlin, Germany: Springer, 2007, pp. 325–341.

[2] X. Su and T. M. Khoshgoftaar, ''A survey of collaborative filtering techniques,'' Adv. Artif. Intell., vol. 2009, Aug. 2009, Art. no. 421425.

[3] M. N. Jelassi, S. B. Yahia, and E. M. Nguifo, A personalized recommender system based on users' information in folksonomies, in Proc. 22nd Int. Conf. World Wide Web, Rio de Janeiro, Brazil, 2013.

[4] I. Portugal, P. Alencar, and D. Cowan, The use of machine learning algorithms in recommender systems: A systematic review, Expert Syst. Appl., vol. 97, pp. 205–227, 2018

[5] K. Goldberg, T. Roeder, D. Gupta, and C. Perkins, Eigentaste: A constant time collaborative filtering algorithm, Information Retrieval, vol. 4, no. 2, pp. 133–151, 2001.

[6] J. S. Breese, D. Heckerman, and C. Kadie, Empirical analysis of predictive algorithms for collaborative filtering, in Proc. 14th Conf. Uncertainty