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RECOMMENDATION SYSTEM FOR MOVIE BY USING MACHHINE LEARNING

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***Abstract*— A data filtering approach is a recommendation system. They are used to provide recommendations to users based on their interests and needs. It is a highly popular approach in recent years, and many e-commerce websites and other platforms use it to recommend news, books, movies, shopping products, novels, music, and other items, which is why recommendation systems have become a hot issue. Data filtering systems include recommendation systems as a subset. Whereas there are many types recommendation systems are utilized on numerous platforms and have become an basic feature of a variety of applications. It's a decision-making procedure that will assist people in purchasing things that they're interested in. Recommendation systems are a very helpful and effective method of data filtering. This paper is a study of recommendation systems that will discuss recommendation systems, how they operate and assist in various platforms, and the many types of recommendation systems, as well as their benefits and drawbacks.**

***Keywords*: Recommendation System, Unsupervised Learning**

INTRODUCTION

The goal of a recommendation system, [1] is to give effective and useful content (item) to users who are engaged on the site. In recent years, recommendation algorithms have grown in popularity. After the publication of the first work on collaborative filtering in the mid-1990s, recommendation systems became a popular study topic. The term "recommendation system" refers to a technology that is used to filter and retrieve data. The sales of e-commerce websites and other platforms are also boosted with the aid of these technologies. These systems are essentially a software tool that offers users with services and things in which they are interested, as well as assisting them in finding the items they desire It is now a generic phrase for giving services to users based on their preferences.

Recommendation systems are an area of machine learning technology[2] that falls under the category of unsupervised learning machine learning models, in which data is not labeled, as mention in [fig1].

The aim of the machine or model in unsupervised machine learning approaches is to group uncategorized data according to similarities, patterns, and differences without giving the computer any form of training. Recommendation systems are a type of unsupervised machine learning in which the data is not labeled, allowing unsupervised learning approaches to discover hidden and cluster information.

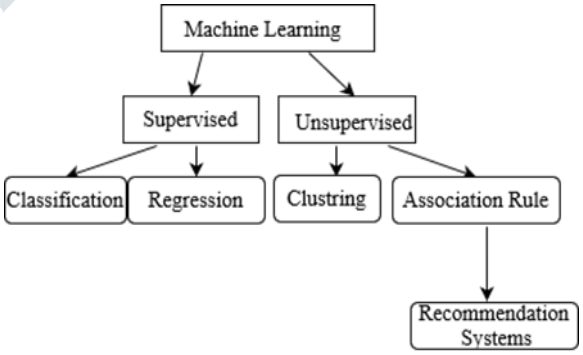

Fig. 1. Recommendation Systems in Machine Learning.

Many websites utilize recommendation algorithms to provide a better user experience. J. Ben Schafer, Joseph Konstan, and John [15] provide the greatest examples of recommender systems. You may have seen suggestions on

Amazon such as "Customer who bought","Amazon.com Delivers", "Book Matchers", on Moviefinder.com such as "We Predict", "Match Maker", on Reel.com, eBay, and others. They compiled a list of the technologies, programmes, and other tools that users may use to get recommendations and how they do it. Recommendation systems are incredibly effective data filtering strategies since they allow you to learn more about the user. Depending on the platform, many types of suggest systems exist.

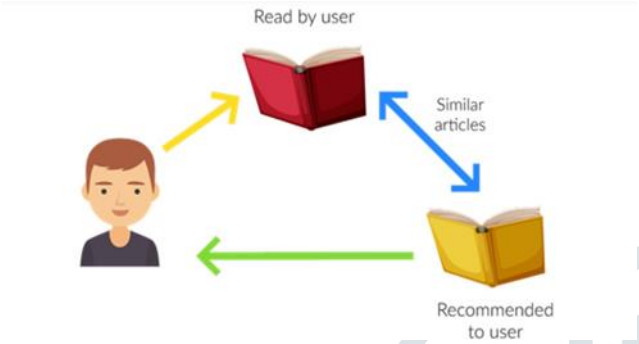

Fig. 2. Recommendation Systems in Machine Learning.

As seen in the diagram above, a user purchased a book, and the recommender system advised him to purchase similar type of book. The book was displayed at the top of the screen based on previous behavior and the preferences of the user. Basically, this is how these platforms' recommendation systems function. These recommendation systems are used to filter data and provide a better experience for the user, and they have become a common part of everyone's life. Providing recommendations to anyone is a difficult task, but it is accomplished by these systems, which is why these systems are becoming more popular in the research field.

CHALLENGES

Recommendation System faces a number of difficulties. These challenges are Conization, Data Scarcity, ascendable.

- Conization: It requires a how many number of users in the system to locate a match. If we wish to locate a comparable individual or object, for example, we match them against the collection of available users or goods. Because a new user's profile is empty at first because he hasn't rated anything and the system doesn't know what he likes, it's tough for the system to make recommendations for him. The same may be said about a new item, which has yet to be reviewed by any user because it is new to them.
- Data Scarcity: The user or rating matrix has a lot of free space. Because the most of users do not evaluate the things, it is difficult to discover individuals who have rated the same items .As a result, finding a class of people who score the things becomes difficult. When there is little information on a user, it is extremely difficult to provide a recommendation.
- Ascendable: Collective filtering makes use of a huge amount of data to improve dependability, which necessitates a huge number of resources. As data expands at an exponential rate, processing becomes more costly and incorrect, posing a Big data quandary.

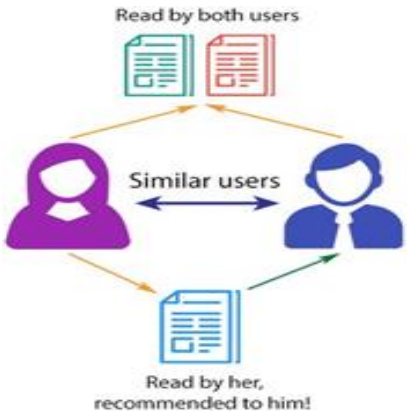

Fig. 3. Content Based Filtering.

These strategies are employed in a variety of e-commerce platforms and give a better experience than other ways for suggesting contents (products).The [fig4] figure clearly shows how collaborative filtering algorithms function Collaborative Filtering is a widely used recommendation tool. These approaches may be grouped into two types, according to Recommender systems, Handbook by F. Ricci, Lior Rokach, B. Shapira, and Paul B. Kantor [5]. The first is the Neighborhood based method, and the second is the Model based method.

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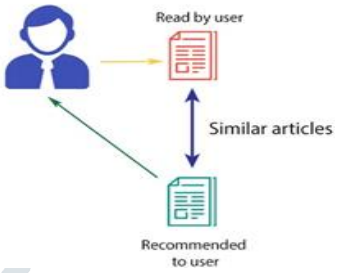

Fig. 4. Collaborative Filtering.

Users input ratings via the Neighborhood Based Method, and the algorithm computes the similarities between users and things [2]. Memory-based or heuristic-based approaches are other names for it. These strategies are simple to execute, comprehend, and do not need any training. As a result, the user's assess are saved in memory, and a new item is recommended to the user immediately. User based collaborative filtering (UBCF) and item based collaborative filtering (IBCF) are two forms of neighbourhood approaches techniques, according to K. Shah, A.k Salunke, S. Dongare, and K. Antala [2]. (IBCF) .

In UBCF approaches, recommendations [3] are generated based on the likes or dislikes of the active user's neighbours node, but in IBCF techniques, the similarity between things is computed, and then an item is offered to the user. The primary idea behind UBCF is to find peer users who have similar preferences to the present user using a database of ratings and the current user's id as input.

Recommended goods in UBCF techniques have been loved by other users who share their taste and preferences. The disadvantage of UBCF, is that if a user likes an item but his/her neighbours do not, the item will not be recommended to the user u, whereas the basic idea of IBCF is to calculate the similarity between two items using ratings given by other users in related ways. IBCF, calculates item similarities first and then predicts the item to the user. G. Gupta and

R. Katarya [3] stated in their study that suggestions based on previously liked things produce successful outcomes when compared to recommendations based on comparable items liked by all u
sers. This simply indicates that IBCF outperforms UBCF.
The following topic is replical-based approaches, which are the second category of collaborative filtering procedures. replica-based techniques, according to K. Shah, A.k Salunke,

S. Dongare, and K. Antala [2,] first train the dataset, then use the learned dataset to forecast user input for every new item. The previously recorded ratings are utilised for prediction in neighbourhood approaches, while in model-based methods, the ratings gain comprehension and then forecast the model. Support Vector Machine [9], Latent Semantic Analysis [10], Singular Value Decomposition [11], and other approaches are employed for this.The benefit of these strategies is that the algorithm deals with a much smaller matrix with a lower dimensional space [12].

These algorithms compare the sim- ilarities of result matrices in a way that is scalable enough to handle huge datasets [13].
The advantages of collaborative filtering techniques include the ease with which new data may be added when using neighborhood-based collaborative filtering approaches. These approaches can forecast tailored suggestions since they assess a user's previous behaviour, discover comparable users, and then predict similar tastes in another user.
These techniques capture the user's interest over time, but their limitations are that the systems have a Conization, which means that if the user is new to the database (website, etc.) it is difficult to recommend anything to them, and these techniques require a huge number of users to give a new item a rating or feedback.

ADVANTAGES AND DISADVANTAGES

A. Advantages of content-based filtering

- They can recommend unlimited things.
- Content-based recommendation algorithms just need the impacted user's rating, not the ratings of other system users.

B. Dis-Advantages of content-based filtering

- It's doesn't applicable to a new user who
- still hasn't rated anything quite as sufficient material based on content suggestions made by the reviewer, who assesses the user's tastes and makes correct recommendations.

C. Advantages of collaborative-based filtering

- They can be reliant on user connections, implying that they are unaffected by content.
- They can check the true quality of things by considering other affected user, people's information.

D. Dis-Advantages of collaborative-based filtering

- Collaborative filtering systems are unable to provide new product recommendations as there are no user ratings on which to predict based.

CONCLUSION

Recommendation systems are a prominent approach in today's world, and they assist to provide a better experience for both the consumer and the firm. These systems can be content- based or collaborative, depending on the system that the developers have created. In this study, we examine the many types of recommendation systems, as well as their benefits and draw- backs. Content-based filtering approaches are advantageous in the case of new users; however these systems do have certain drawbacks .The collaborative filtering techniques are split into two categories; neighborhood approaches, which are used to promote basic items but lack accuracy, and model based methods, which increase the quality of the cold-start problem. Collaborative filtering systems are very popular because they have many advantages.

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