Project Proposal Report

On

RECOMMENDATION SYSTEM

Submitted by

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Abstract

We know that oyr life is surrounded by various technology mobile apps and internet resources.we often use these thing to entertain ourselves in the form of vedio ,movies and products,we find these thing from our personal liking. One of today's most important concerns is providing personalised services to each individual based on their preferences. To accomplish this goal, a recommender system could be used as a tool to assist users in their decision-making process by providing various items and options. They are used to predict and recommend relevant products to users. An item in this case could be anything, such as a document, a location, a movie, an article, or even a user (friend suggestion). The main goal of recommender systems is to suggest items that have a high likelihood of being liked by users. Various methods are combined in modern recommender systems with the goal of extracting patterns in available datasets. The combination of different algorithms complicates prediction because various parameters must be taken into account when making recommendations. Personalized or non-personalized recommendations are both possible.The selection of items for a user in a non-personalized type is based on the number of times an item has been visited in the past by other users. The main goal of the personalized type, on the other hand, should provide the best items to the user based on her taste and preferences. Although recommender systems have made significant advances in many domains and are now providing better services to users, more research is needed to improve the accuracy of recommendations in many areas. In fact, the current recommender systems on the market are far from the ideal model of the recommender system. This paper examines the state-of-the-art recommender system algorithms and techniques, which are required to identify gaps and areas for improvement. In addition, we discuss in detail recommender system evaluation methods.

Contents

1 INTRODUCTION

Recommendation System:

"Which mobile phone should I buy?", "Which movie should I watch this weekend?", "Where should family and I go to spend the coming holidays?", "Which books should I carry during my long vacation?" – These are a few examples of very common indecision for which we often seek suggestions from our friends and known ones. Unfortunately, almost every one of us has experienced that those friendly suggestions, even with their best intention, are not really effective in many of the cases as others' taste does not necessarily mean to harmonise with that of ours

Recommender systems are more popular and increase the production costs for many service providers. Today the world is an over-crowded so that the recommendations are required for recommending products or services. However recommender systems minimize the transaction costs and improves the quality and decision making process to users . It is applied in various neighboring areas like information retrieval or human computer interaction (HCI). It gathers huge amount of information about user's preferences of several items like online shopping products, movies, taxi, TV, tourism, restaurants, etc. It stores information of different ways either positive or negative manner. It captures users review for watched movies, traveled places, and purchased products. When compare demand from the shopping products, service providers (travel, and restaurants), movie recommendation system design a big problem since other recommendation systems require fast computation and processing service from service providers and product distributors. To recommend movies, first collects the ratings for users and then recommend the top list of items to the target user . In addition to this, users can check reviews of other usersbefore watching movie. A different recommendation schemes have been presented includes collaborative filtering, content-based recommender system, and hybrid recommender system. However, several issues are raised with users posted reviews.

A Recommendation System is simply a filtering system that attempts to forecast and display what a user would be interested in purchasing. It may not be completely accurate, but if it shows you what you want, it is doing its job correctly. In this Projects Project we built a Recommendation System, which uses the concepts of Bipartite Graph.
Recommender Systems are software tools and techniques providing suggestions of relevant items to users. The suggestions relate to various decision-making processes, such as what products to buy, what music to listen to, or what TV programs to watch.[**?**] Therefore, recommender systems can help people to identify contents of their interest among a large set of options available.

Bipartite Graph :
Let's consider a graph G(V, E). The graph G is a bipartite graph if

- The vertex set V of G can be partitioned into two disjoint and independent sets V_1 and V_2.
- All the edges from the edge set E have one endpoint vertex from the set V_1 and another endpoint vertex from the set V_2.

Let's try to simplify it further. Now in graph G, we've two partitioned vertex sets V_1 and V_2. Suppose we've an edge (E_1, E_2) $\in$ E. Now according to the definition of a bipartite graph, the edge (E_1, E_2) should connect to one vertex from set V_1 and another from set V_2.

Let's Understand Bipartite Graph with the help of an example.

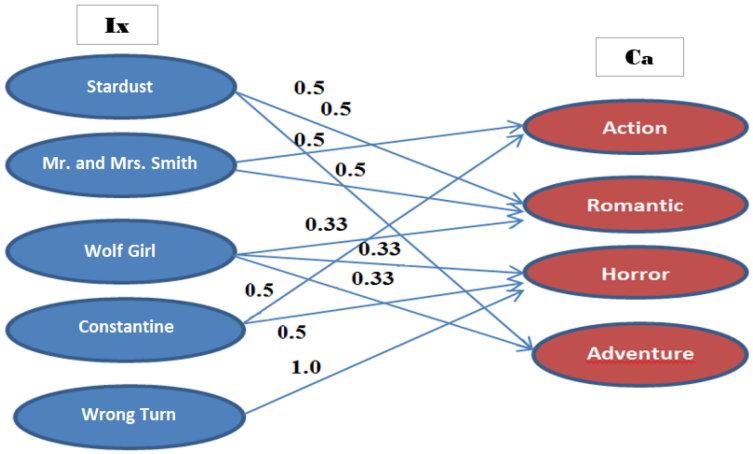

Figure 1: A random Graph

Here, we've taken a random graph G_1(V, E). Now, to satisfy the definition of a bipartite graph, the vertex set needs to be partitioned into two sets such that each edge joins the two vertex sets.[**?**]

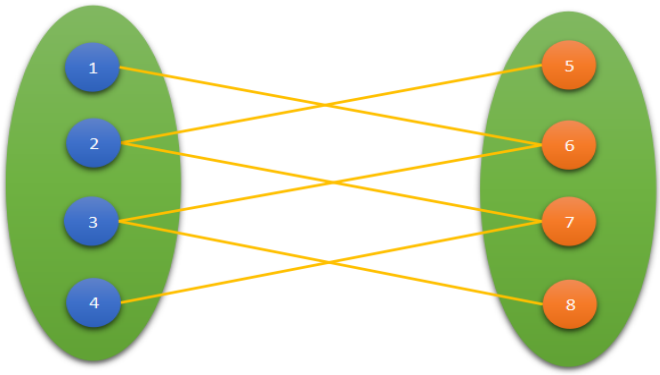

Figure: Bipartite Graph

Figure 2: Bipartite Graph

In Figure 2,this is the same graph G_1, just with a different representation. Here, we partition the vertex set V=(A, B, C, D, E) into two disjoint vertex sets V_1 = (A, D) and V_2 = (B, C, E).

Also, we can see the edges from the edge set E = (E_1, E_2, E_3, E_4, E_5, E_6) follows the definition of a bipartite graph. Each edge has one endpoint in V_1 and another endpoint in V_2.

2 RELATED WORK

A recommender system is defined as a decision-making strategy for users under complex information environments. Also, the recommender system was defined from the perspective of E-commerce as a tool that helps users search through records of knowledge that is related to users' interests and preferences.[**?**] A recommender system was defined as a means of assisting and augmenting the social process of using recommendations of others to make choices when there is no sufficient personal knowledge or experience of the alternatives.[**?**] Recommender systems handle the problem of information overload that users usually encounter by providing them with personalized, exclusive content and service recommendations. Recently, various approaches for building recommendation systems have been developed, which can utilize either collaborative filtering, content-based filtering, or hybrid filtering. The collaborative filtering technique is the most mature and the most commonly implemented. Collaborative filtering recommends items by identifying other users with similar tastes; it uses their opinion to recommend items to the active user. Collaborative recommender systems have been implemented in different application areas. GroupLens is a news-based architecture that employs collaborative methods in assisting users in locating articles from the massive news database. [**?**] Ringo is an online social information filtering system that uses collaborative filtering to build users' profiles based on their ratings on music albums. Amazon uses topic diversification algorithms to improve its recommendation. The system uses a collaborative filtering method to overcome scalability issues by generating a table of similar items offline through the use of an item-to-item matrix. The system then recommends other products which are similar online according to the users' purchase history. On the other hand, content-based techniques match content resources to user characteristics. Content-based filtering techniques normally base their predictions on users' information, and they ignore contributions from other users, as with the case of collaborative techniques. Fab relies heavily on the ratings of different users in order to create a training set, and it is an example of a content-based recommender system. Some other systems that use content-based filtering to help users find information on the Internet include Letizia. [**?**] [**?**]

Companies benefit through recommendation system :

Netflix	2/3rd of the movies watched are recommended
Google News	recommendations generate 38% more click-troughs
Amazon	35% sales from recommendations
Choice stream	28% of the people would buy more music if they found what they liked

Figure 3: Companies benefit through recommendation system

3 ALGORITHM FOR RECOMMENDATION SYSTEM

The Algorithm that we have used for the Recommendation system is as follows [**?**]:

- Input users name and there choices.
- Store above inputs in the form of adjacency list.
- Adjacency list represents Bipartite graph of users and choices.
- For users find no of edges connected to choices node.
- For each choices from step 4 find no of edges connected with users.
- For each users from step 5 find no of edges connected with choices and push into set.
- Find intersection of user choices 4 from and the set we get from step 6 and store into vector.
- Delete step 7 vector from step 4 choices.
- Repeat step 4-8 for every users.
- Push every users answer into vector.
- push each vector into another vector.
- If any vector is empty print "NO RECOMMENDATION FROM ANY USER".
- Else Print each vector for each user.

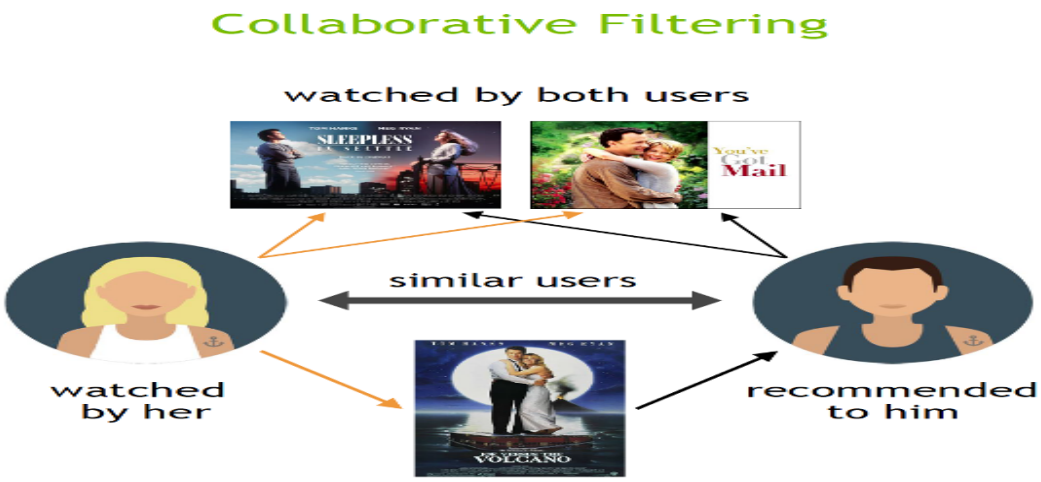

Figure 4: Recommendation Chart

4 APPLICATIONS OF RECOMMENDATION SYSTEM

Friend recommender system for social networks :
Based on a user's social graph, different social networking sites or services recommend friends to its users, which may not reflect the user's preferences on selecting a friend in real life.

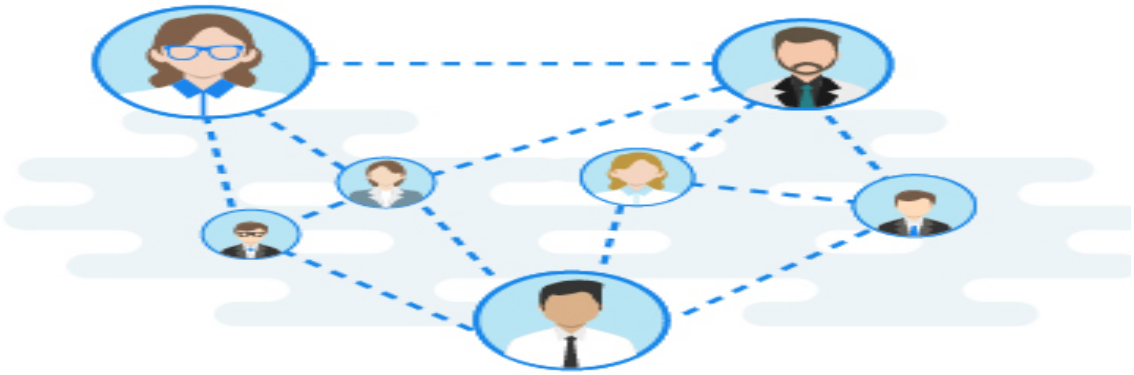

Figure 5: Picture from: facebook

Amazon Recommendations :
Amazon practically invented the concept of giving personalized product recommendations after online purchases, using an algorithm they call "item-based collaborative filtering." This algorithm makes the homepage of each of its many millions of customers unique, based on their interests can increase revenue by showing more ads.

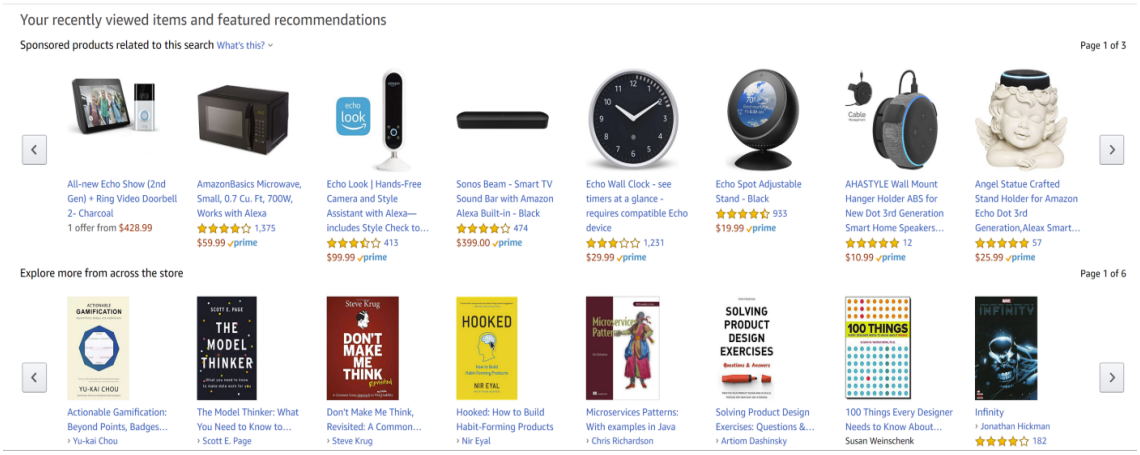

Figure 6: Picture from: Amazon.com

5 INPUT AND OUTPUT SNAPS

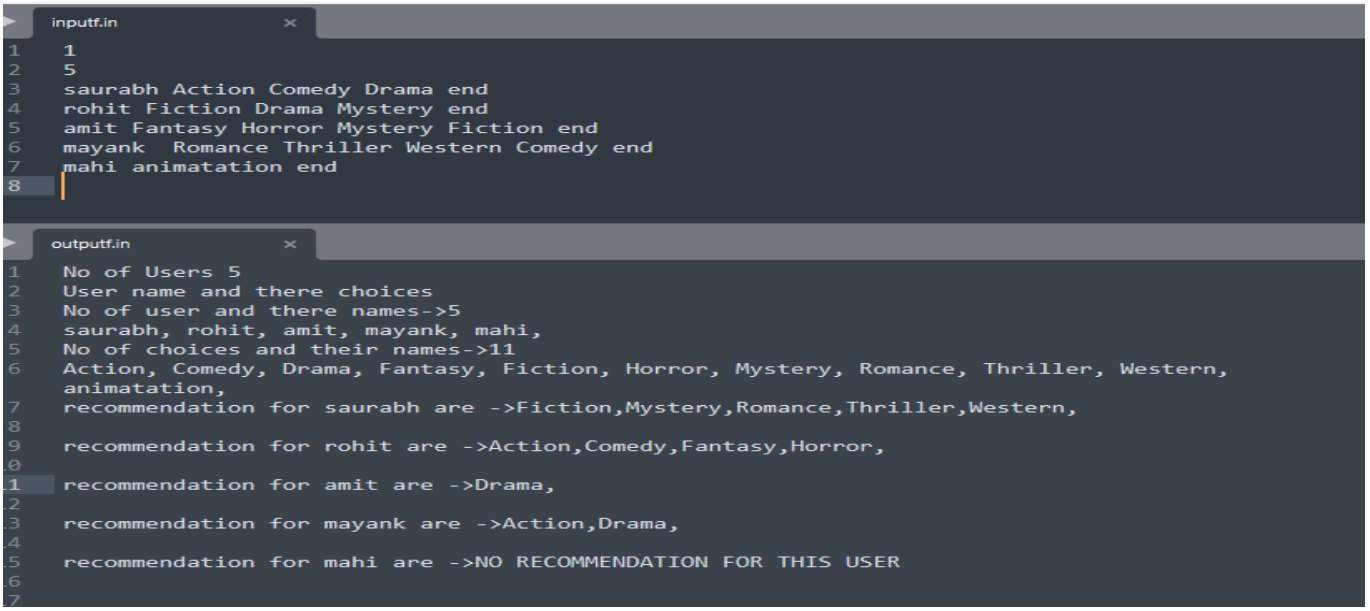

Figure 7: input and output

6 CONCLUSION

A recommender systems are an important research field today. Rabidly, increasing in data size like a number of items and users over sites raises the big data analysis techniques like Spark, Map-Reduce, Apache Hadoop, etc. Recommender system used to recommend items to the user according to their interests and previous items rate list. Recommender systems are a powerful new technology for extracting additional value for a business from its user databases. These systems help users find items they want to buy from a business. Recommender systems benefit users by enabling them to find items they like. Conversely, they help the business by generating more sales. Recommender systems are rapidly becoming a crucial tool in E-commerce on the Web. Recommender systems are being stressed by the huge volume of user data in existing corporate databases, and will be stressed even more by the increasing volume of user data available on the Web. New technologies are needed that can dramatically improve the scalability of recommender systems. In this paper, we discuss recommender systems.

7 PROJECT CONTRIBUTION

AMIT KUMAR (212CS003)

(a) Concept and algorithm.
(b) Power point presentation.

MAYANK (212CS012)

(a) Involved in code and implementation.
(b) Power point presentation.

PREM SAGAR (212CS019)

(a) Involved in code and implementation.
(b) Power point presentation.

ROHIT NIKHARE (212IS024)

(a) Concept and Algorithm.
(b) Power point presentation.

SAURABH SINGH (212IS028)

(a) Concept and Algorithm.
(b) Power point presentation.

8 THE BIBLIOGRAPHY

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