

# A Novel Collaborative Filtering Recommendation System Algorithm

Meenal Moghe, Abhishek Raghuvanshi

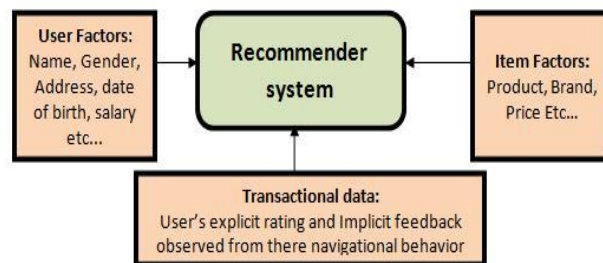
**Abstract**— The internet and world wide web have brought us an abundant information in various fields and due to the information overloading, it is very hard to find out relevant content so, Recommendation System come into existence. The main aim of Recommendation system is to provide suggestions to a user. The suggestions relevant to decision-making processes, like what items to buy, which music to listen to, which online news to read, or which movie is best one. The benefit of recommendation system depends on utility of the system. The utility can be measured in terms of accuracy, flexibility, reliability, sparsity. The proposed work mainly applies an association mining over clustering to recommend the best suitable items to the user by generating better rules. The Clustering is applied to the group of user's set into k clusters by applying k-means algorithm and Association mining is used for generating the rules.

**Index Terms**— Apriori , Association mining, Clustering, K-means.

## I. INTRODUCTION

In everyday life, people rely on recommendations from other people through spoken words, reference letters, news reports from news media, general surveys, travel guides etc. So recommendation system plays an important role in finding the best items. A recommendation system consists of information filtering which applies different data analysis techniques to help the customers for finding the relative content with the help of a predicted likeness score.

Here user's choices are given as input and output will be the list of recommendations. User's choices are known by the ratings which are given by the user. Recommendation system recommends items like music, movies etc. with the help of information filtering technique [1]. In recommendation system, it mainly consist 3 different approaches they are content based approach, collaborative based approach, Hybrid based approach. The Content-based filtering methods are based on a description of the item and a profile of the user's preference. Collaborative filtering methods are based on collecting and analyzing information of users' behaviors, activities or preferences and predicting what users will like based on their similarity with the other users.



## II. RECOMMENDATION APPROACHES

Three main categories of approaches have been developed for recommendations. First is Content - based system which recommends items similar to those users preferred in the past. Second is Collaborative Filtering method which recommends items to users based on similarity between items. Lastly, Hybrid Approach combines above two methods. All approaches aim to give qualitative recommendations. Quality of recommendations includes accuracy, diversity, novelty and serendipity.

### A. Content Based Recommendation System:

The content based filtering approach is used where individual weights were assigned to the keywords of the content and will stored in a content vector and other user items are compared with items which were rated higher by an individual user earlier and after finding similarity between them, the items which have higher similarity measures will be assigned with higher utility and these articles will be suggested to the user. The system first finds out the requirements of item specified by the user and uses keywords from that to find out the knowledge base discovery. The items which are similar to the user requirements are recommended as final result.

### 2.2 Collaborative Based Recommendation System:

In collaborative recommendation system it utilizes different collaborative methods for recommendation to the user. It will also find the similarity with different users and based on similarity of preferences with different users. Here system finds out the similarity between users to make suggestion because of their choices is correlated in the past, and will make the system to improve the accuracy.

## III. RECOMMENDATION SYSTEM TECHNIQUES:

### A. K-Mean Algorithm:

This flowchart represent how cluster are created we first take how many cluster we want to created .after that we select random number of object for that cluster and we calculate the Centriod (mean) and calculate the distance for each object with Centriod (Grouping based on minimum Distance) if No object move group into any group then we stop other we repeat the process until the final cluster is created

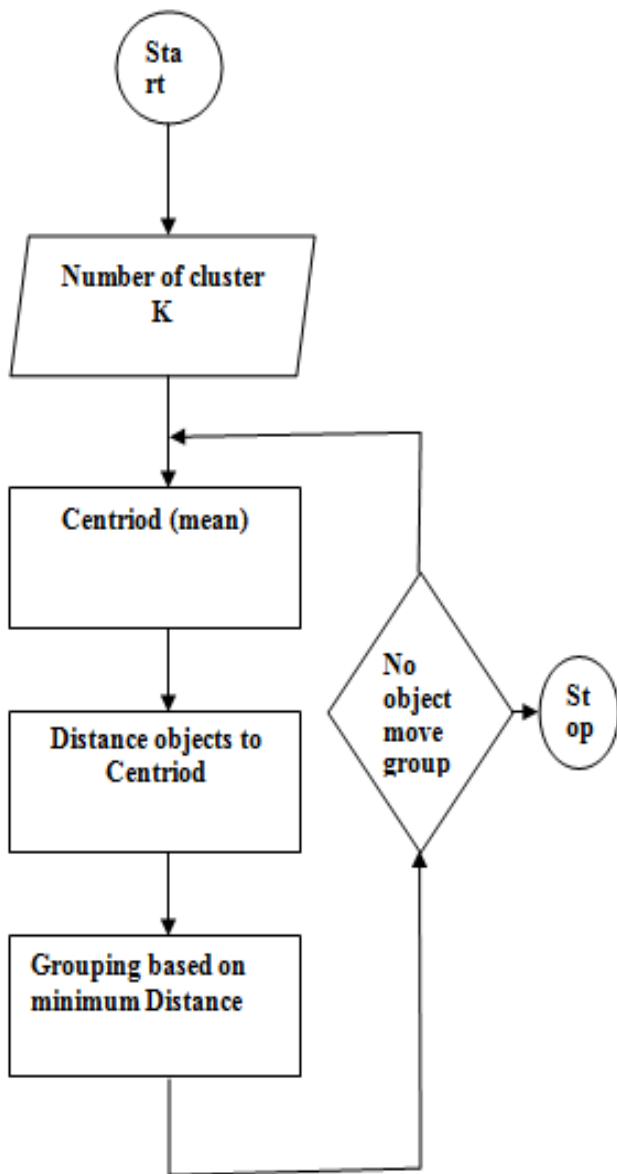


Figure 2 Flow chart for K-Mean Algorithm

*B. Apriori algorithm*

The Apriori algorithm developed by Agrawal, 1994 [30] is a great achievement in the history of mining association rules. It is by far the most well-known association rule algorithm. This technique uses the property that any subset of a large item set must be a large item set. Also, it is assumed that items within an item set are kept in lexicographic order. The fundamental differences of this algorithm from the AIS and SETM algorithms are the way of generating candidate item sets and the selection of candidate item sets for counting. As mentioned earlier, in both the AIS and SETM algorithms, the common itemsets between large item sets of the previous pass and items of a transaction are obtained. These common item sets are extended with other individual items in the transaction to generate candidate item sets. However, those individual items may not be large. As we know that a superset of one large item set and a small item set will result in a small item set, these techniques generate too many candidate item sets which turn out to be small. The Apriori algorithm addresses this important issue.

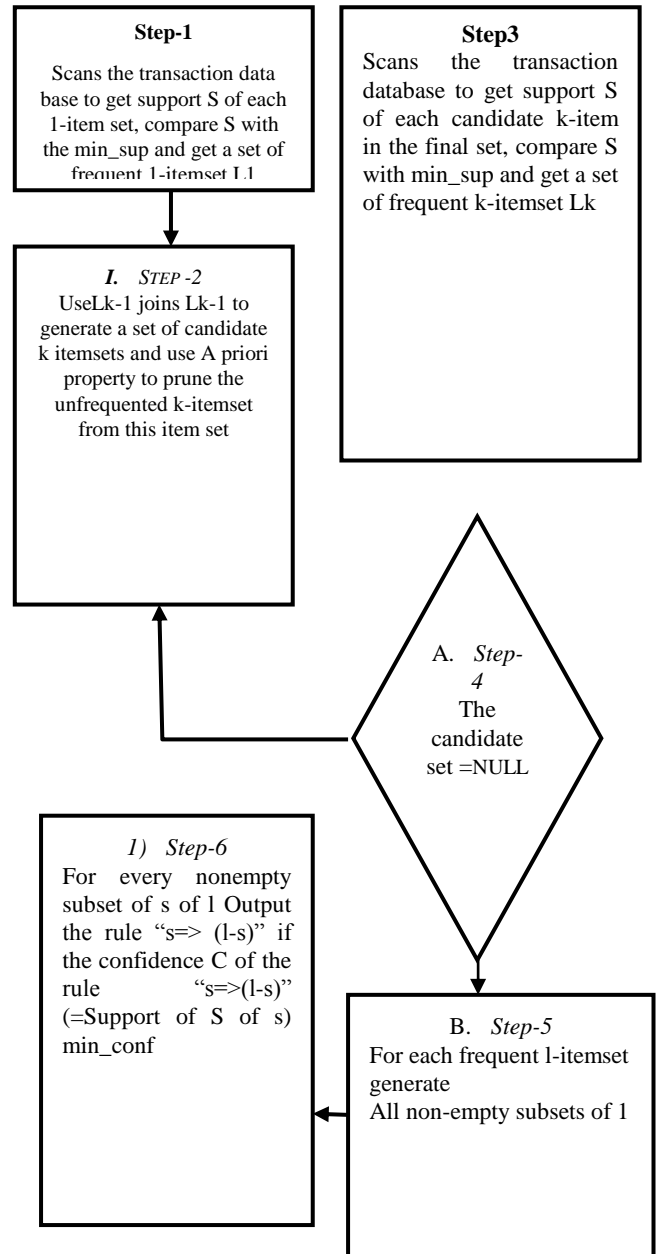


Figure 3 Flow Chart Apriori Algorithm using recommendation systems

IV. PROCESS:

Hybrid recommendation systems combine different approaches such as content based approach, collaborative approach, etc. to improve the accuracy and to overcome the drawback of single approach. Different types of hybrid recommendation method consist: weighted, cascaded, mixed, Feature augmentation.

V. CONCLUSION

Recommendation systems provide valuable suggestions to users with the help of user rating data. The main aim of the proposed system is to recommend the best suitable items to the user. The advantages of proposed system is that it takes lesser execution time as compared to other methods and giving more promising results for applications and tries to improve the problem of sparsity.

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