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ONLINE PRODUCT RECOMMENDATION SYSTEM

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Abstract:A product recommendation is basically a filtering system that seeks to predict and show the items that a user would like to purchase. It may not be entirely accurate, but if it shows you what you like then it is doing its job right. With the vast amount of data that the world has nowadays, Companies like Amazon use their huge amounts of data to give recommendations for users. Based on similarities among items, systems can give predictions for new items rating. Recommender systems use the user, item, and ratings information to predict how other users will like a particular item. The motivation for this project comes from the eagerness to get a deep understanding of recommender systems. In this project, a website has been developed that uses different techniques for recommendations namely Frequent Itemset and Association Mining using Apriori algorithm.

Keywords: Product Recommendation, Similar Data items, Machine Learning.

I. INTRODUCTION

The increase in enrolment is due to institutions of higher education expanding online programs to respond to the changing demand and need of online education. Yet, little has been done with one aspect of student support services – sharing information about which courses to take to fulfil requirements. Part of the lack of online student support for course advising or course recommendation is because many of the classes are filled with students who are enrolled in traditional face-to-face courses as well as online courses so the students can use the same advising structure and word of mouth processes as usual. But as institutions begin to move programs to online only, unlike students enrolled in traditional programs, online students are not limited in selection of courses to fill their general education requirements because they do not have to select classes to "fit around" other requirements needed for graduation within their majors or college. Thus, online students experience more flexibility in course selection. However, these same students suffer from the lack of information generally received from upper class men – recommendations on what to take based on personal preference or interests. Most students online or traditional receive recommendations from advisors who tend to recommend classes to students based on schedules or "what other students have found successful within the discipline." This approach of word of mouth is not easily transferable to the online student. Not that the number of electives for general education is staggering. But if institutions position themselves accordingly, the number of enrolees in online programs could be. The volume of potential students may be considerably more than a group of individuals can handle. The system described in this paper is designed to provide that word-of-mouth approach that students miss when engaged in a pure online program.

II. RELATED WORKS

Artificial intelligence (AI) is the ability of a computer program or a machine to think and learn. It is also a field of study which tries to make computers "smart". As machines become increasingly capable, mental facilities once thought to require intelligence are removed from the definition. AI is an area of computer sciences that emphasizes the creation of intelligent machines that work and reacts like humans. Some of the activities computers with artificial intelligence are designed for include: Face recognition, Learning, Planning, Decision making etc.,

Artificial intelligence is the use of computer science programming to imitate human thought and action by analysing data and surroundings, solving or anticipating problems and learning or self-teaching to adapt to a variety of tasks.

Machine learning is a growing technology which enables computers to learn automatically from past data. Machine learning uses various algorithms **for building mathematical models and making predictions using**

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historical data or information. Currently, it is being used for various tasks such as **image recognition, speech recognition, email filtering, Facebook auto-tagging, recommender system**, and many more.

Machine Learning is said as a subset of **artificial intelligence** that is mainly concerned with the development of algorithms which allow a computer to learn from the data and past experiences on their own. The term machine learning was first introduced by **Arthur Samuel in 1959**. We can define it in a summarized way as: "Machine learning enables a machine to automatically learn from data, improve performance from experiences, and predict things without being explicitly programmed".

A Machine Learning system **learns from historical data, builds the prediction models, and whenever it receives new data, predicts the output for it**. The accuracy of predicted output depends upon the amount of data, as the huge amount of data helps to build a better model which predicts the output more accurately.

Suppose we have a complex problem, where we need to perform some predictions, so instead of writing a code for it, we just need to feed the data to generic algorithms, and with the help of these algorithms, machine builds the logic as per the data and predict the output. Machine learning has changed our way of thinking about the problem. The below block diagram explains the working of Machine Learning algorithm.\

FREQUENT ITEMSET ALGORITHM

Association Mining

Searches for frequent items in the data-set. In frequent mining usually the interesting associations and correlations between item sets in transactional and relational databases are found. In short, Frequent Mining shows which items appear together in a transaction or relation.

Need of Association Mining:

Frequent mining is generation of association rules from a Transactional Dataset. If there are 2 items X and Y purchased frequently then its good to put them together in stores or provide some discount offer on one item on purchase of other item. This can really increase the sales. For example it is likely to find that if a customer buys **Milk** and **bread** he/she also buys Butter. So the association rule is **['milk]^['bread']=>['butter']**. So seller can suggest the customer to buy butter if he/she buys Milk and Bread.

APRIORI ALGORITHM

Association rule mining is a technique to identify underlying relations between different items. Take an example of a Super Market where customers can buy variety of items. Usually, there is a pattern in what the customers buy. For instance, mothers with babies buy baby products such as milk and diapers. Damsels may buy makeup items whereas bachelors may buy beers and chips etc. In short, transactions involve a pattern. More profit can be generated if the relationship between the items purchased in different transactions can be identified.

For instance, if item A and B are bought together more frequently then several steps can be taken to increase the profit. For example:

1. A and B can be placed together so that when a customer buys one of the product he doesn't have to go far away to buy the other product.
2. People who buy one of the products can be targeted through an advertisement campaign to buy the other.

PROBLEM DEFINITION:

- Huge number of dataset collected
- More number product recommendation showing to the user
- High accuracy
- Increase speed.

III. EXISTING SYSTEM

- Text movie reviews which can be used as features for a recommendation system.
- The information extracted from the users opinions can be employed in combination with structured information about the movies which in turn leads to better results.
- Movie Based aspect extraction and clustering approach yields the best results while the candidate extraction and clustering work fully automatic.

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DISADVANTAGES

- Less number of product analysis
- Recommendation of product showing is less
- Low accuracy

IV. PROPOSED SYSTEM

This paper proposes an approach to improve the performance of recommendation systems using user reviews. The experiments are performed on Amazon product dataset which consists of product ratings and reviews. A comparison between traditional rating-based and the proposed recommendation system shows improvement in the recall and root mean square error (RMSE) scores of recommendation system.

ADVANTAGES

- Huge number of dataset collected
- More number product recommendation showing to the user
- High accuracy
- Increase speed

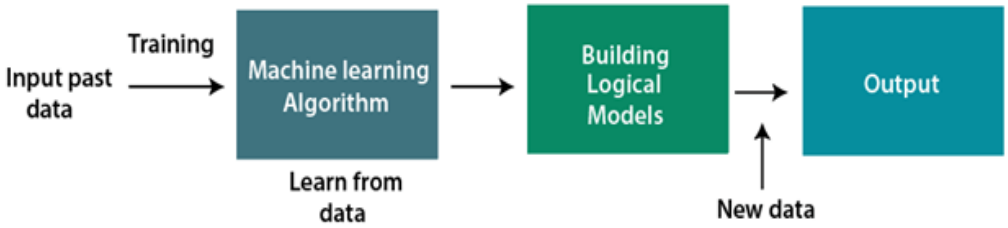

Figure 1: Architecture Diagram

V. IMPLEMENTATION

LIST OF MODULED

The proposed system is composed of the following modules:

Module 1: Dataset Collection
Module 2: Pre processing
Module 3: Implement the model
Module 4: Product Recommendation

VI. TESTING

Testing is performed to identify errors. Testing is used for equality assurance. Testing is an integrated part of the entire development and maintenance process. The goal of the entire during phase is to verify that the specification has been accurately and completely incorporated into the design as well as to ensure the correctness of the design itself. Testing is one of the important factor in the software development phase.

VII. CONCLUSION

Thus the recommender system was successfully implemented. We found that Frequent itemset include Association rule and Apriori Algorithm was the best as the accuracy was higher in its case as compared to the rest of the methods. For working on large dataset, it was an approach in implementing the algorithm and making it a web-based Recommender System. This is similar to the algorithm that Netflix uses in its website to recommend movies to its customers. It was a challenge for me to implement a web-based recommender system on this scale of huge data. Recommender systems have become ubiquitous. People use them to find books, music, news, smart phones, vacation trips, and romantic partners. Nearly every product, service, or type of information has recommenders to help people select from among the myriad alternatives the few they would most appreciate. Sustaining these commercial applications is a vibrant research community, with creative interaction ideas, powerful new algorithms, and careful experiments.

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