Tourism Recommendation System with Collaborative Filtering and Data Mining

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Abstract- *Now a days many peoples are interested to visit new places and spend their valuable time with family or friends. They arrange tour with family member or group of friends. In this paper we use tourism recommendation system. But the large number of users are used this system. So keyword based recommendation system is the best approach for tourism recommendation system because it is easy to understand. Basically it is totally depends upon the similarities of users opinion like ranking or rating and it takes the user's feedback from the service like positive or negative. After the data mining process recommendation is having high support and confidence level and it is considered as strong recommendation. In this paper we combine recommendation for tourism application by using a filtering and data mining using keyword based search.*

Keywords- Collaborative filtering, Association rule mining, tourism, recommendation system.

I. INTRODUCTION

Data Mining is the method of identifying valid, novel, and useful patterns from huge amount of data. It is also refers as the process of extracting or "mining" knowledge from large amount of data. It functionalities includes Data characterization, Data discrimination, Association analysis, Classification, prediction, Cluster analysis, Outlier analysis, Evolution analysis etc. Discovering patterns from the data via Association rule mining techniques are commonly used in many applications such as pattern recognition, market research, image processing and biological data analysis [1].

Second section of this paper we propose a hybrid method of recommendation system. Third section gives the need for the new system. Fourth section gives the related work done for this recommendation system. In fifth section we had focused on proposed system. Finally in sixth section we had given comparison of the different methods of recommendation system by using data mining techniques.

Recommendation system is used to provide recommendations of interesting items in a wide variety of application domains such as web page recommendation, digital news, movie recommendation, travel agent and many others. A variety of approaches has been used to perform recommendations in the domains which includes collaborative, content-based, demographic and knowledge based.

In this research paper, tourism recommendation system applies both content-based and collaborative approaches. TRS conducts personalized travel recommendation by considering specific user profiles or attributes (e.g. Age, gender, race, personal, professional) as well as travel group types (e.g. Family group, couple).The system provides information about tourist places based on their similarity.

II. REVIEW OF LITERATURE

[1] Masoumeh Mohammad and Mehregan Mahdavi [2012].

Collaborative filtering is the proposed method which is used for recommendation system. Clustering and association rule mining these are the data mining techniques used in recommendation system.Clustering also used the K-means algorithm.

[2] Adomavicius, G., Tuzhilin [2007].

Recommendation method is used for the large number of users and items for identifying the similar users. To improve the quality and to provide strong recommendation to the users these are the main objective and aim of recommendation system. Collaborative filtering and content-based filtering this are the two methods of recommendation are described by author in simple way. Data mining techniques such as clustering and association rule mining are working on four phases cluster based on their location, two level graph models is used to show the similarity between the interest of tourist and the similarity of the tours.

[3] Aggarwal, C. C., Procopiuc, C., and Yu, P. S. [2012].

The author has proposed an example of online shopping mall. But in this application the explicit rating information about online shopping mall is not available. So that the problem about providing recommendation services using collaborative filtering techniques for their users is occur. Here author used pattern analysis to provide recommendation to the users with less accuracy. This article proposed a scheme for providing rating given as a customer that can be applied to the online transaction.

[4] An-Jung Cheng, Yan-Ying Chen, and Winston H. Hsu[2013]

There are two approaches are used in tourism recommendation system first is content based filtering and second is collaborative approach. Travel recommendation is conducted by tourism recommendation system by considering specific user profiles or attributes like age, gender, personal, and professional as well as travel group types like, Family group, friends group, and couple. Based on the similarity of tourist places the system provides information to the user.

[5] Lee, C.-H., Kim, Y.-H., Rhee, P.-K[2013]

Recommendation method used the hybrid approach of collaborative filtering and content-based filtering. Data mining technique is used for sorting frequent item from large amount of data. It is also called associative classification method which can combine the concept of classification and association. Also they show the comparison method to improve the quality of recommendation.

III. PROPOSED SYSTEM

Tourist places ratings and reviews based collaborative filtering

- Users will rate tourist places on various objectives
- Users will specify reviews about visited places and hotels, which will be used to find out the ranking of particular place and hotels.

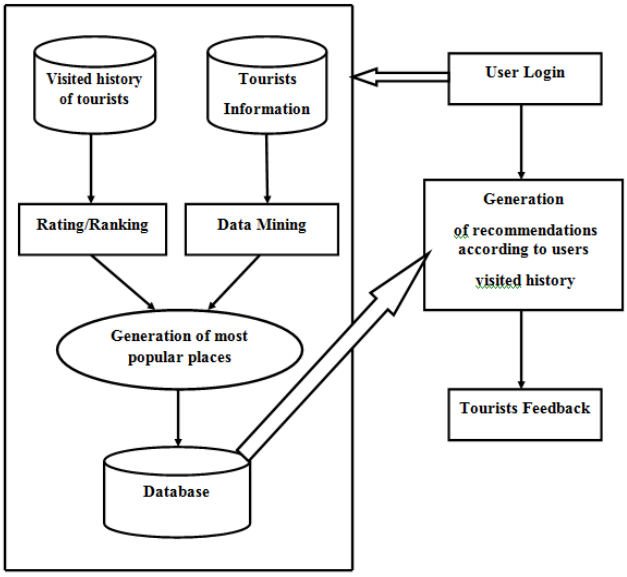

Figure 1. System architecture

a. The representation of user (tourist) information. The visiting history of attractions by tourist need to be analyzed and modeled.
b. The generation of neighbor users (tourists). The similarity of tourists can be computed according to the visiting history data and the collaborative filtering algorithm presented by us. A neighbor tourist list can be calculated on the basis of known similarities.
c. The generation of attraction recommendations. Top- N attractions will recommend to the tourist according to the visiting history of his neighbors.

IV. SYSTEM ANALYSIS

Data mining consists of the following Step [1]:

Step 1: Find all frequent item sets.

Get frequent items:

- Items whose occurrence in database is greater than or equal to the min. support threshold.

Get frequent item sets:

- Generate candidates from frequent items.
- Prune the results to find the frequent item sets.

Step 2: Generate strong association rules from frequent item sets. Rules which satisfy the min. support and min.confidence threshold.

This work also proposes the working of Collaborative Filtering.

Collaborative Filtering consists of two major step:

Step 1: A user expresses his or her preferences by rating items (e.g. books, travels name or place) of the system. These ratings can be viewed as an approximate representation of the user's interest in the corresponding domain.

Step 2: The system matches this user's ratings against other users' and finds the people with most "similar".

Step 3: With similar users, the system recommends items that the similar users have rated highly but not yet being rated by this user (presumably the absence of rating is often considered as the unfamiliarity of an item).

V. SOFTWARE REQUIREMENT SPECIFICATION

We implemented and design the system using java and JSP. Data is stored in Mysql database. We have created a web application for search tourist from anywhere with local server. Web application that communicates with local server and connect as a client and server. We have checked unauthorized user access to the main server for performing unauthorized activity. Here we also check user log details for future analysis.

VI. MATHEMATICAL MODEL

Set Theory
User Module:

Set U = u1, u2, u3, u4
u1=Available java Systems.
u2 = Resources Required
u3 =Search for travel rout for Execution.
u4 =analysis graph.
Set S = s1, s2, s3, s4
S1 = get user registration.
S2 = activate user for java services.
S3 = check the Files for Execution.
S4 = Allocate Resources for Execution.

Mining Module:

Set D = d1, d2, d3, d4, d5
d1 = Read keyword to be execute.
d2 = Analysis of keyword
d3 = Feedback system for travel services.
d4 = Execution.
d5 = Deployment.

VII. SYSTEM ANALYSIS

Let S be the system
Where S= I, O, P
Where,
I = Set of input
O = Set of output
P = Set of technical processes
Let 'S' is the system,
S = {Identify the input data S1, S2,…,Sn}
I = {({types of places, activity}, budget, start date, distance, number of vacation days, number of people), travel options}

Searching places P with {{types of places, activity}, travelling season}=k using apriori algorithm.

K= Filter places from k where distance < user defined distance using knn algorithm

Select the places from K where, travelling cost+ staying cost+ activity cost is < user defined budget

Find the user rating for recommended places.
Searching route recommended mid station for source, destination, and type of interest
R ={ r1, r2,...,rn}
Where, each r is the recommended route for matching mid stations
Identify the Places as P
K means algorithm for clustering similar type of places, activities, season to visit

User input={source, destination, type of interest, activities}
Identify the output applications as O

O ={ K, R, Places, Activity, Hotel, Travelling option, Nearby attraction, distance, rating}

VIII. CONCLUSION

By using different techniques, methods we generate tourist recommendation system. Collaborative filtering approach is used by recommendation system for making automatic predictions according to the users interest by collecting preferences from many users. Finally user got the recommendation about tourist places from the system.

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