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TRAVELLER'S GUIDE: A Personalized Recommendation System for Tourists

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Abstract- Recommender systems are currently being applied in many different domains. This paper focuses on their applicatons in tourism. Information about travel destination and their associated resources such as accommodations, restaueants, near by attaractions, is commonly searched by tourist in order to plan a trip or tourist may consult travel agencies for plan their trip.

Tourist has to plan their trip according to agencies available packages. Each tourist's interest, budget and need are not considered when trip is planned by travel agencies. There are generalized packages are offered by travel agencies and does not give freedom to tourist to choose their hotels, restaurants according to their choice, budget and need.

To solve this problems we propose a system in which tourists will define their need , time, date, interest, hobbies then system provide recommendations like best places to travel which are nearer to his current location, cost of package, points according to season, schedule, hotels, transportation options based on his/her interest.

Index Terms- Recommendation, KNN Clustering Algorithm, Apriori Classification Algorithm, Machine Learning, Supervised Machine Learning.

I. INTRODUCTION

Travelling is an important part of our life. Hence planning of it is also important. Now days, lots of travelling agencies are there which helps tourists to plan their vacations according to their packages. Hence sometimes users need to adjust their plans according to their agencies plans. Lots of Websites provides us travelling options like hotels. Some websites helps us to plan our trips. They recommend us places if we specify a particular location. But these systems are more generalized and also they may suggest us same places repeatedly. It may also happen that some plans may not fit in tourist's budget.

This system overcomes all these drawbacks of travelling agencies and websites. In this system, user needs to create their profile in which he/she will enter personal details like interest, hobbies, budget, number of peoples, previously visited places, dates for vacation planning, etc. And according to these information system will recommend places or tourist plans along with hotels. It will also recommend travelling options like by car or by flight or by bus, etc. This system is more personalized i.e. it will recommend places which are more specific to each user. Also it will not recommend those places which the user has already visited. User can also give feedback for places which they have already visited. According to that, high rating places can be recommended to other users.

Personalization techniques aim to provide customized information to users based on their preferences, restrictions or tastes. They are particularly relevant in recommender systems, whose objective is to filter irrelevant options and to provide personalized and relevant information to each particular user. In the tourism field, travel recommender systems aim to match the characteristics of tourism and leisure resources or attractions with the user needs. These systems are especially useful if they can automatically learn the user's preferences through the analysis of her explicit or implicit feedback. Explicit data may be given by the user in different ways, for instance whenever she specifies her cultural interests by filling in a form. Implicit interests can be inferred by the system through the analysis of the behavior of the user.

II. EXISTING SYSTEM

When we want to plan a trip for holidays or general visit, very first we take a help from travel agencies then we need to plan according to travel agencies. But, because of this we face some difficulties like our vacation get start but travel agency package date is at the end of our holiday or in our working time.

Existing system is generalized system, i.e. travelling recommendation might be same for some of tourists. It provides plans according to travel agencies, which is not match with tourist need and interest. Sometime packages are too much costly which are not affordable by tourist. Sometime travel agencies promises good quality service to tourist, but that does not happen actually and tourist face many problems.

III. PROPOSED SYSTEM

We propose a system in which tourist will define his/her interest, budget, holiday starting date and ending date then system will provide some recommendation like cost of package, best places to visit according to season, schedule, System Architecture hotels and different packages, travelling options, etc based on his/her need, past history, budget, interest. Then tourist will choose place and other things according to its need.

System architecture is as shown in fig1. System architecture consists of admin, tourist user and system itself. Admin will add new places to the dataset. Tourist's user will search for places as per their interest, need and budget. System will do analysis of data and filter it as per the user need.

Euclidian Distance formula is used to find distance between two places. KNN algorithm is used to find the nearest attraction and location in this project. In this project, apriori algorithm is used for classification. In this project we are recommending the frequently visited places as we storing history of tourists.

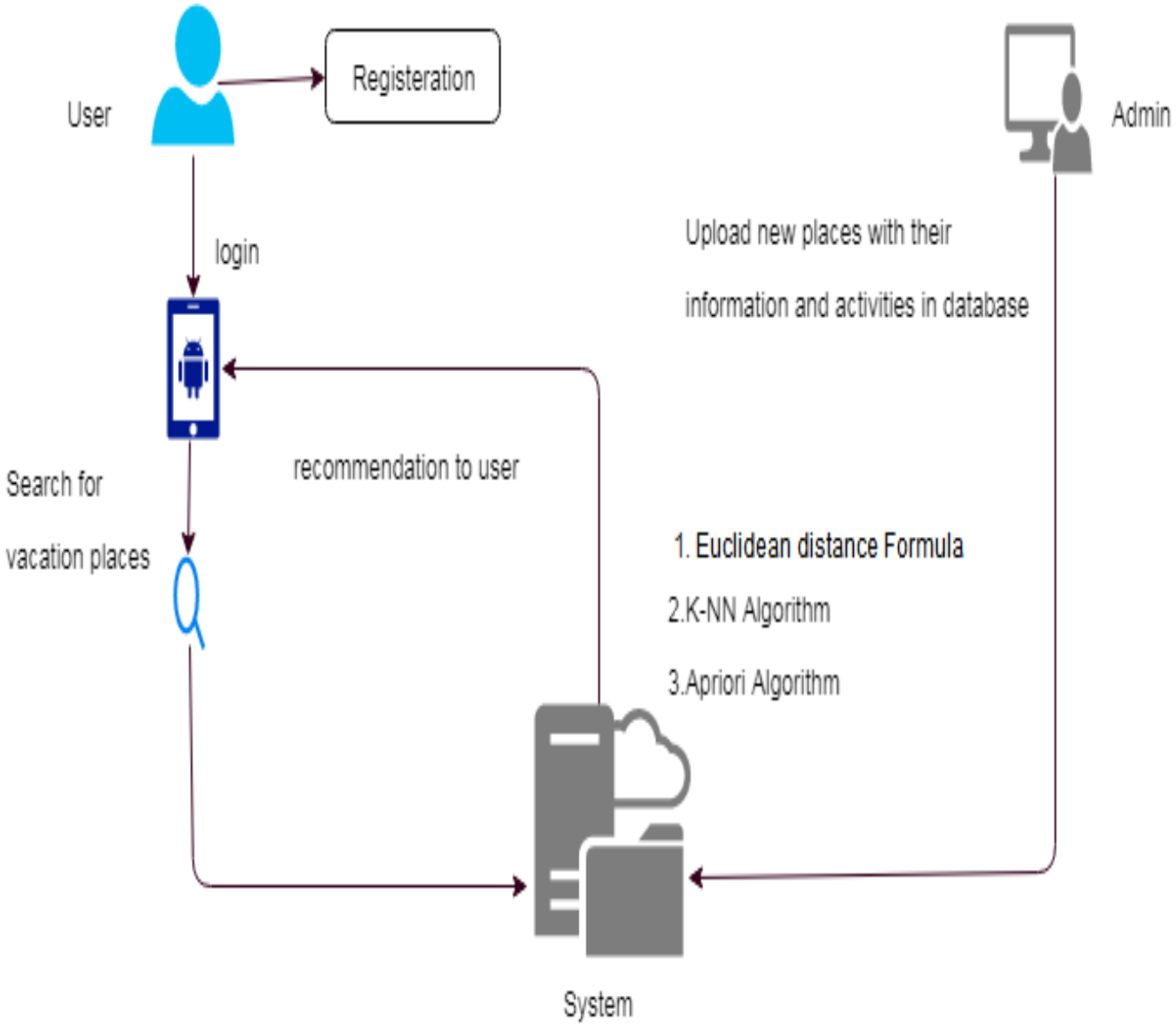

Fig.1: System Architecture

IV. INTERFACE

This section analyses the user interfaces of recent tourism recommender systems. Most of them offer a Web-based interface and/or an interface specifically designed to be used in mobile devices. A Web-based interface is the option chosen by most of the systems, since it permits an easy access from any computer connected to the Web without any kind of downloading, installation and configuration. However, due to the enormous increase in the use of smart phones connected to the Web in the last years, more than half of their viewed systems have specific interfaces for mobile devices

A. Web-based Recommendation

The use of a Web-based interface is the most common option adopted by e-Tourism recommenders. This kind of interfaces allows tourists to look for information in a user-friendly manner. Users normally have a rich interaction with the system using a wide screen which allows displaying a large amount of data extended with maps, images or even high quality videos. Moreover, the mouse permits to interact easily with the computer and move through maps, perform zoom actions, select items or even drag and drop them. This is very useful for tourists when they are still in the planning stage of their trips. Nevertheless, Web based applications are usually not designed to be used during thestay since most of the tourists will not have easy access to computers with Internet connection. Although an increasing number of tourists have mobile handsets or tablets with Internet connection, the information-ridden Web pages usually shown by recommenders cannot be easily read or manipulated on such small screens. In the remainder of this section we comment some interesting features exploited in Web-based interfaces to improve the interaction with the users.

B. Mobile-Recommendations

Systems that offer mobile interfaces have increased considerably in the last few years, due to the large number of users acquiring mobile devices with Internet connection or, more recently, the well-known smart phones. Mobile devices are small and their Internet connection is usually slow; thus, the quantity of information that can be shown in these devices cannot be compared with a standard Web page. Therefore, mobile tourism recommender systems have to make an effort to provide only the information that is essential for the user, and it must be well structured in order to be displayed correctly in small screens. Moreover, the user's interaction with the system is limited, since even the basic actions made in Web-based interfaces (scrolling, introducing text) are not that easy. However, it is fair to say that the latest smart phones with bigger touch screens provide a better user interaction. Furthermore, the main advantage of mobile devices is that they allow the use of the system in any place with an Internet connection, so that tourists may access information, discover places or modify their trips during the stay. Besides, most mobile systems are equipped with GPS and the recommender may know the present location of the user and it may offer geo-referenced information, advice or recommendations based on this knowledge

V. ALGORITHM

A. Distance Calculation Formula

It is used to find distance between two places.
We can compute the distance between two scenarios using some distance function, where are scenarios composed of features.

Euclidean distance measuring:

$$d_E(x,y) = \sum_{i=1}^{N} \sqrt{x_i{}^2 - y_i{}^2}$$

Xi – is the Longitude of ith SR and Yi – is the Latitude of ith SR.

X – is the Longitude of New SR and Y – is the Latitude of New SR.

B. KNN Algorithm:

In pattern recognition, the ***k*-nearest neighbors algorithm** (***k*-NN**) is a non-parametric method used for classification and regression. In both cases, the input consists of the *k* closest training examples in the feature space. In k-NN classification, the output is a class membership. An object is classified by a majority vote of its neighbors, with the object being assigned to the class most common among its *k* nearest neighbors (*k* is a positive integer, typically small). If *k* = 1, then the object is simply assigned to the class of that single nearest neighbor.

KNN algorithm is used to find the nearest attraction and location in this project. In this project dataset is very important; we are storing many locations in that dataset along with distance. Then we will find nearest locations by calculating distance between current place and all locations stored in dataset.

C. Algorithm for Distance Functions

As stated previously, we are only considering absolute (Equation 1) and Euclidean (Equation 2) distance functions.

1. User raised Service Request
2. Get confirmation on SR number
3. Capture Longitude and Latitude from the SR.
4. Compare the distance from point represented by Longitude and Latitude of new SR with all other open SR in Garbage or Road network Queue using Euclidean distance measuring formula.

5. Check the distance from new Sr point to respective open SR points falling within 20mtrs
6. If within 20 mtrs then attach the SR to the existing open SR falling within 20mtrs
7. If not within 20 meters then it will be a new SR in queue.

In above formula i- is the SR number open in queue.
Xi – is the Longitude of ith SR and Yi – is the Latitude of ith SR.
X – is the Longitude of New SR and Y – is the Latitude of New SR.
N – is the number of open SR.

D. Apriori Algorithm:

In this project, apriori algorithm is used for classification. In this project we are recommending the frequently visited places as we storing history of tourists.

Apriori is an algorithm for frequent item set mining and association rule learning over transactional databases. It proceeds by identifying the frequent individual items in the database and extending them to larger and larger item sets as long as those item sets appear sufficiently often in the database. The frequent item sets determined by Apriori can be used to determine association rules which highlight general trends in the database.
Join Step: C k is generated by joining Lk-1with itself

- Prune Step: Any (k-1)-itemset that is not frequent cannot be a subset of a frequent k-itemset
- Pseudo-code:

C k: Candidate itemset of size k
L k : frequent itemset of size k
L 1 = {frequent items};
for (k = 1; L k != ∅; k++) do begin

Ck+1 = candidates generated from L k;
for each transaction t in database do increment the count of all candidates in Ck+1 that are contained in t Lk+1 = candidates in Ck+1 with min_support

End
Return ∪ k L k;

VI. CONCLUSION

This paper proposed Recommendation System for tourist who wants to plan a trip. Recommendation is done on basis of tourist needs, interest, budget and past history. Our system recommend tourist new places, nearby hotels, nearby attraction, provide review for places and hotels, interface for booking hotels and give estimation for trip, gives transportation information.

Advantages of proposed system

- Tourists choose the package as per its holiday.
- Budget decided by user.
- Recommends places as per tourists need..
- Easy efficient technology with user friendly access

VII. FUTURE SCOPE

Currently our system only recommends places, hotels, transportation means, nearby attraction, interface for booking hotels from existing websites. In Future, it can be further extended to provide hotel booking system instead of redirecting to existing hotel booking sites.

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