

Trippler – A Travel Recommendation System Using Machine Learning Techniques

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ABSTRACT

Tourism plays an important role in creating economy for various sectors, but tourists face problems in selecting the places to visit of their choice. Development of a recommendation system in tourism sector provides assistance to tourists and makes their planning easier. Rapid growth of web and its applications has created a colossal importance for recommendation systems. Being applied in various domains, recommender systems were designed to generate suggestions such as items or services based on user interests. An effective recommendation system can be developed using machine learning algorithms and python framework. Trippler is a travel recommender web application which is combination of apriori algorithm and flask framework. Hence, this helps users in identifying places according to their interest.

Keywords: *recommendation system, machine learning algorithms, framework, web application, apriori, flask.*

1. INTRODUCTION

Tourism and travelling plays a vital role in creating economy for various occupational sectors. As computer accessories have become more accessible and available to average person in the society, web applications play an important role in people lifestyle. Since, recommendation systems are available in almost all the domains but recommendation or suggesting models dedicated to travelling domain is so minimal. Recommendation system means it is a working model that suggests users with the products they like or according to their interest. In this case it is related to travel which deals with different places. The proposed model is inclusive of several machine learning methodologies along with a user-friendly interface which assists users in selecting various places to travel according to their choice of interest. Trippler is one of the smart recommendation models that is dedicated for suggesting various places to its users. The baseline of trippler is totally dependent on the dataset that contains names of different places and cities. Since, python language is most relevant in developing machine learning models we are using python as our programming language to develop trippler. In order to work on dataset there are libraries readily available in python one among them is 'pandas' this helps in manipulating data and organize it according to our convenience. Having dataset alone doesn't help users to view places according to their interest, we need to combine the dataset with certain machine learning algorithm and train the dataset with it. There are numerous algorithms present but selecting one which helps you to develop the model is important. Here, we use 'apriori' algorithm because it is one among its kind which helps in developing models that need to check frequently used items or frequently occurred items and recommending items. So, this algorithm is correctly suitable for the model that we developed. The results that are generated by the algorithm can be viewed through web application in order to do so we need to combine dataset and algorithm working along with it to user interface which is developed using HTML5 and flask web application framework. One of the standalone features of trippler is that it can maintain its users and their credentials by offering them to register with in the application unlike several other apps which allows users only to get authenticated using facebook and google credentials. To maintain users, we need database since trippler needs to store images, we are using mongodb as our backend database which is easy in maintaining unstructured data like images etc. All the users having complete access over web application and database is a huge flaw within the model we have segregated users into two categories according to their access rights. Normal users who are capable in just selecting the categories of places they like to visit and view places that are according to their interest and view the recommended places that are suggested by the model. Another category in user section is admin where this account has complete access over the web application and database. Admin can add, delete places or cities in database. These places which are added or deleted by admin are not related to the places present in dataset. When administration finds any place is missing in the dataset then this functionality of admin helps in including them in the database which can be viewed by the users of trippler.

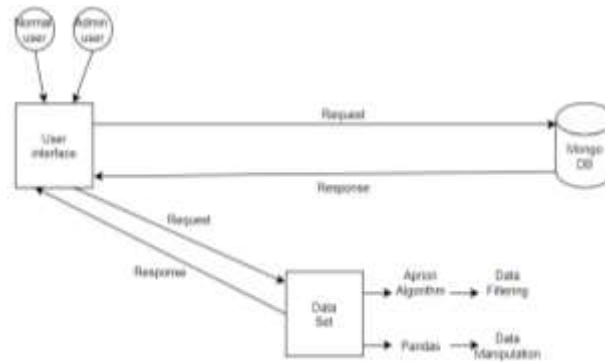


Fig 1: Architecture flow

2. PROBLEM STATEMENT

Limitations in the present available models has stimulated me in developing this project. For example, Holidayfy is a travelling website which gives information about the places but the drawback in it is it doesn't recommend places users based on their interest and also login/signup is done only through Facebook or google accounts. And other website Goibibo whose sole focus is on booking hotels and travelling tickets for the users it doesn't recommend users any places.

3. LITERATURE REVIEW

^[1] Researcher in this paper quotes that travel recommendation system is one of the essential tools. The proposed model recommends different places to its users based on trends in twitter. Parameters include hashtag, URL count etc.

^[2] Holidayfy is a travelling website which gives information about the places when you search. This website provides places nearby to the current location of user.

3.1 Drawbacks

- It doesn't recommend places to users based on their interest.
- Allows login/register only through google or Facebook access.

^[3] Go Ibiblio is a travelling website which is gives information about how to travel to particular places and hotel rooms in that place. This website focuses on booking of different ways of travelling like flight, bus, train

3.2 Drawbacks

- It doesn't recommend places to users based on their interest.
- No categorization of places made.

4. SOLUTION

Machine learning mechanisms plays a vital in recommending travelling destinations to its users by using recommendation algorithm like apriori to suggest places for users according to their choice and usage of data manipulation techniques like pandas and numpy helps in working on the dataset. HTML and CSS is used to generate user interface and the main part of the model that is backend which stores user data and other details regarding places is organized using mongodb. Front end of web application is connected with back end flask framework and mongodb to store data. Tripper also has admin portal which enables admin to add new places and that can be viewed in web application. Basically, this model comes with two different user privileges, one is normal user privilege where in this type users can view different places according to their choice of interest and the other is admin privilege where admin can add, delete new places in the web application and these modifications can be viewed by normal users. It is mandatory that each and every user is required to get authenticated before they could access the web application.

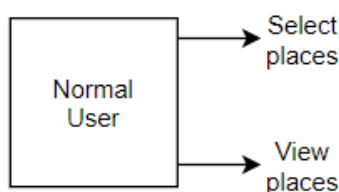


Fig 2: Normal user privileges



Fig 3: Admin user privileges.

5. SYSTEM REQUIREMENTS

5.1 Hardware

- RAM – 2GB
- Storage – 20GB

5.2 Software

5.2.1 Front end

- HTML
- CSS

5.2.2 Back end

- Flask
- Mongo DB

6. FLOW OF MECHANISM

Model gets initiated once the URL is entered in web browser and in order to view the functionalities user must be authenticated to do so normal users should get registered in the web application and with the credentials, they entered during registration can be used for login purpose. Once authenticated he/she can use the web application according to the authorization rights that are allotted to them. Admin user has full control over the web application and privileges of admin differ from normal users.

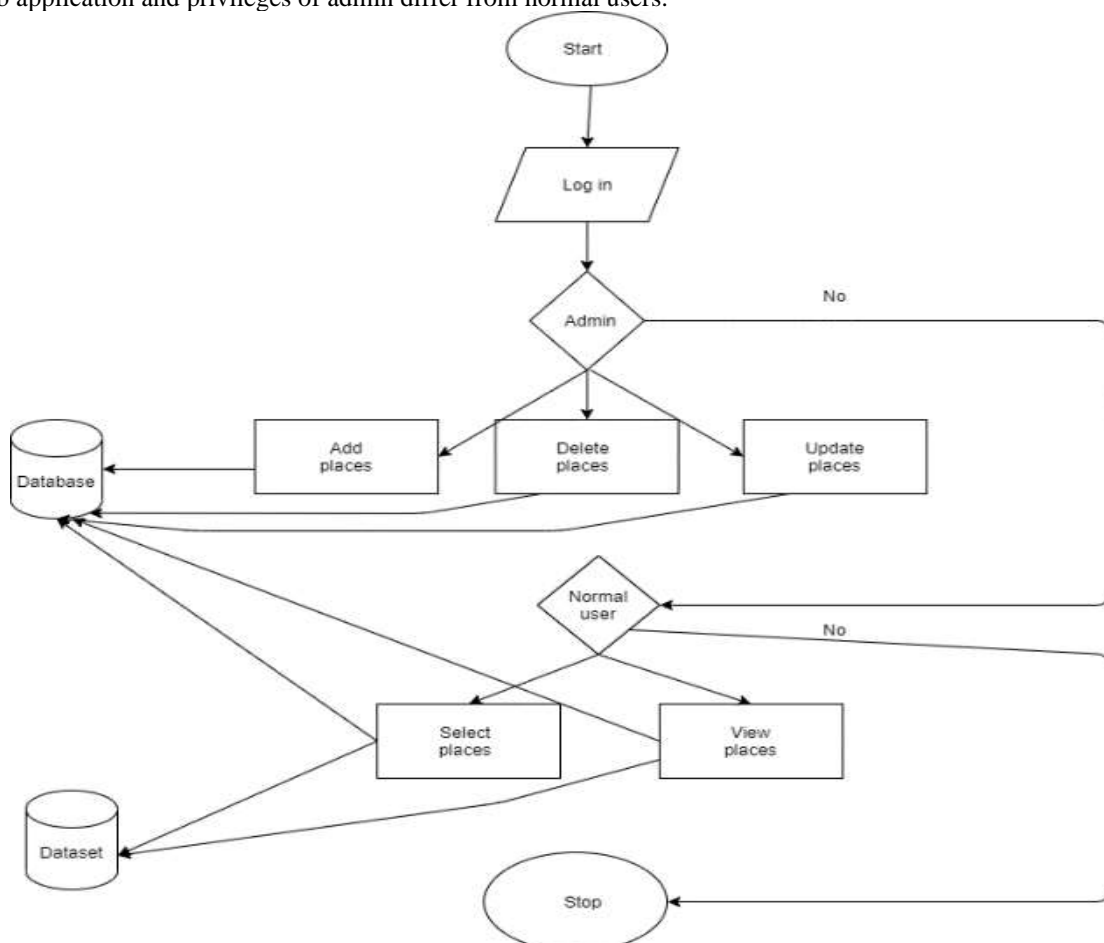


Fig 4: Flowchart

Admin has additional access rights when compared to normal user. Admin user has total control over web application as well as database. But normal users can only view data that is present in dataset and the data that is modified by admin in the database. Apriori algorithm works on the data that is present in dataset and displays the places according to user's choice.

7. ALGORITHM

Apriori is the algorithm that is used in this model development. Apriori is basically used to retrieve frequent items used in the dataset. This algorithm is modified according to the model. In this case algorithm highlights the places in dataset according to user interest.

Parameters of Apriori:

- Support: This refers to frequency of occurrence of data in the data set.
- Confidence: This refers to number of times that the if – then conditions are found true.
- Lift: This parameter is used to evaluate the likelihood of two or more places association in the dataset.

8. IMPLEMENTATION

To develop any recommendation system dataset generation plays a vital role since the data available in dataset will be displayed to the end user. Development of dataset can be done through conducting surveys across multiple people. The data that is fetched from different people who participated in survey are different cities or places that they wish to visit often. Once, the data is generated put them in .csv file. Finding out appropriate algorithm that is suitable to work with dataset and generate results according to the model plays an important role in this case dataset is worked under apriori algorithm. The parameters that present in algorithm helps in generating appropriate results.

In this model algorithm helps in displaying places that user has interest to visit. Basically, the data that is gathered is further clustered into different sections like nature, beach, historical, traditional etc. and when user logs in he/she can select the category of places he like to visit, after this list of places associated with the category selected will be displayed, now user should select any one place he likes and now apriori algorithm works on dataset and recommends user other places. Criteria for recommendation of places is the user selected place should have been entered by other users and other places associated with that place in the dataset will be displayed as recommendation.

9. RESULT ANALYSIS



Fig 5: Normal user login

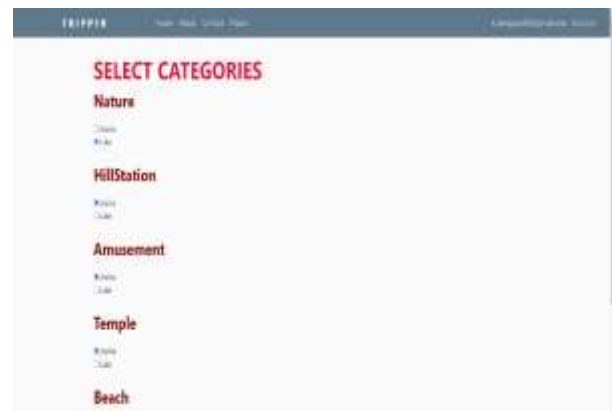


Fig 6: User privileges



Fig 7: Admin login



Fig 8: Admin privileges

10. CONCLUSION

Travel Recommendation System has been developed successfully and performance of the system has been satisfactory. User interface has been designed in such a way that the user doesn't find any difficulty to access. While going through the process of building the travel recommendation system, we came to know about how the various factors work together to play an important role in travel planning.

11. FUTURE ENHANCEMENT

By collecting more data records through extending surveys to various sets of people we can make the model more efficient with the increased number of places to suggest. By adding weather conditions feature to the model we can enhance the functionality and usability of model.

12. REFERENCES

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