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Smart Travel Plan Recommendation System

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Abstract: The enormous growth of web and its user base has become source amount of knowledge available online. This information is also helpful for users, to suggest items or services as per their preferences. Recommender system plays the role of generating suggestions by collecting user information like preferences, interests, and locations. The research on recommender systems gained importance after the emergence of collaborative filtering. Generating suggestions in step with user preferences may be a complex task for recommender systems. Recommender system uses information from many sources to form predictions and to suggest an item for a user. This project are a one-stop tool for travellers planning their vacations by providing them suitable recommendations in step with preferences.

Keywords: Recommender Systems, Machine learning, Collaborative Filtering, Cosine Similarity, Travel and Tourism.

I. INTRODUCTION

What do you do when you need a break from your boring life? – You go on a Vacation!
Now a Days we need a considerable amount of time sitting and planning for any vacations . We must go through every hotel, attraction, restaurant, their rating, reviews, attributes and choosing the set of things to do within our budget – The entire process is highly tedious. Planning for a vacation that takes into consideration all the travel preferences of an individual without having to look through at least hundreds of websites is close to impossible.
Our aim behind doing this project is to reduce the time spent on planning for the vacation and help travellers spend more time on a vacation that they will love. Our project provides a Tailor-made Travel Plan for travellers based on their travel details and preferences. We obtain information from users about the destination, travel dates, trip type, budget, amenities that they look for in hotels, categories of attractions that users would love to visit and their favourite cuisine type. Using these we generate a travel plan for the entire trip, recommending users where to stay, what to do at which part of the day and where to eat for different meals of a day.

II. OBJECTIVES

So the objectives described during this paper are:

1. To develop a Tourism Recommendation System based on their interests and Travel Preferences.
2. To provide a tailor made plan consisting of possible places to stay, attractions to visit and restaurants to eat at for the entire duration of travel.
3. To recommend restaurants separately for each meal of the day (breakfast, lunch and dinner) and provide two recommendations per meal per day.
4. To recommend five possible stay options (hotels) for your travel alongside possible attractions to view.
5. To supply best set of Attractions that tourist can visit day by day. Attractions are recommended supported timing, (i.e) which of them to look at during the day and which of them are better off at the hours of darkness.
6. To supply short and easier approach to tourists to induce what they need.

III. EXISTING SYSTEM

1. The present system recommends hotels with the consideration of user reviews and provides a graphical type of user reviews to create it easier to choose and also the search process of hotels easier for tourists.
2. The system relies on a dataset for hotels.
3. Supported hotel rating, number of reviews and sentiment analysis, the user reviews are analyzed and best hotels are recommended.

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IV. PROPOSED SYSTEM

1. The User/Tourist who want to plan for a vacation will visit the website and will enter their basic details such as name, destination, budget, start date, end date, trip type and the preferences.
2.Once the data is entered, the data from the web application will be send to the corresponding machine learning models which will predict the five best hotels , best set of attractions for each day using travelling salesman problem and best restaurants for all the meals of the day for each day.
3.The Results from the corresponding models will be given as an input to an another machine learning model which will predict nearby emergency services to each predicted hotels and attractions.
4.The output of the above mentioned model will be displayed on the website.
5.The users will get an additional option in which they can receive the travel plan via email on signing up to the website.

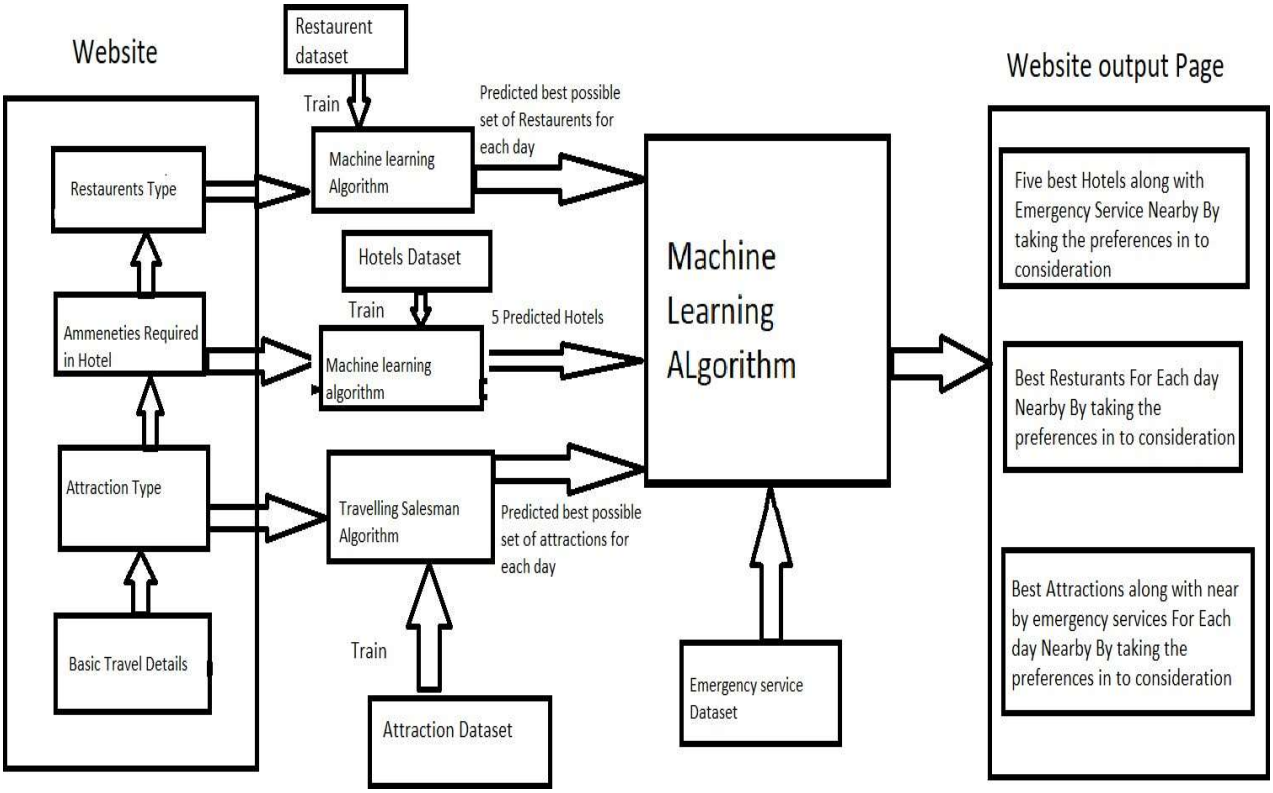

Fig 1: System Architecture

V. IMPLEMENTATION DETAILS

The data required to provide the recommendations mentioned above was not available readily. Web scraping techniques were used to crawl through several attractions, hotels and their respective reviews on each item from relevant websites. To obtain these datasets, we crawled through thousands of attractions and hotels on Tripadvisor and cleartrip. We had to crawl through hotels and attractions in a different manner due to unique HTML page structures of both the categories.In order to have a better understanding of the data collected and integrated for recommendations, we performed extensive exploratory data analysis on various features of each dataset. This step was highly significant in helping us understand the distribution of prices and ratings across different categories and other attributes in the dataset. EDA helped us arrive at the decision for using specific attributes from each dataset for user profiling by explaining variance in the data with respect to different attributes of the dataset.

Hotels:- The dataset for the hotels is been downloaded from kaggle from whose link is as follows: https://www.kaggle.com/PromptCloudHQ/indian-hotels-on-cleartrip

Attractions:- Since the dataset for the attractions was not available online . So we have scrapped the data from Trip.com whose link is as follows:

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https://www.trip.com/travel-guide/search/?keyword=rajasthan
https://www.trip.com/travel-guide/search/?keyword=kerala

Restaurants:-Since the dataset for the Resaturants was not available online . So we have scrapped the data from Zomato.com whose link is as follows:
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https://www.zomato.com/bikaner/delivery
https://www.zomato.com/alwar/delivery
https://www.zomato.com/udaipur/delivery
https://www.zomato.com/jodhpur/delivery
https://www.zomato.com/thiruvananthapuram/delivery

Model Building And Training:
COLLABORATIVE FILTERING :
Mainly based on information of user's behaviour and interest and prediction. Mainly it does not depend on machine learning and complex information can be recommended. Much **i**nformation is collected from other users. This can be combined with soft computing techniques for achieving accuracy.

In this project we are using cosine based similarity to calculate the similarity coefficient between the tuples or rows and on the basis of it we are fetching top 10 similar tuples or rows. For front end we have used html css bootstrap and for backend we have used flask which is a python framework.

VI. RESULTS

Step 1: Firstly, the datasets for the hotels is loaded and pre-preprocessed along with proper analysis and then by applying the Collaborative Filtering Technique ,the resultant recommendations are stored in the final data frame by taking the amenities into consideration.

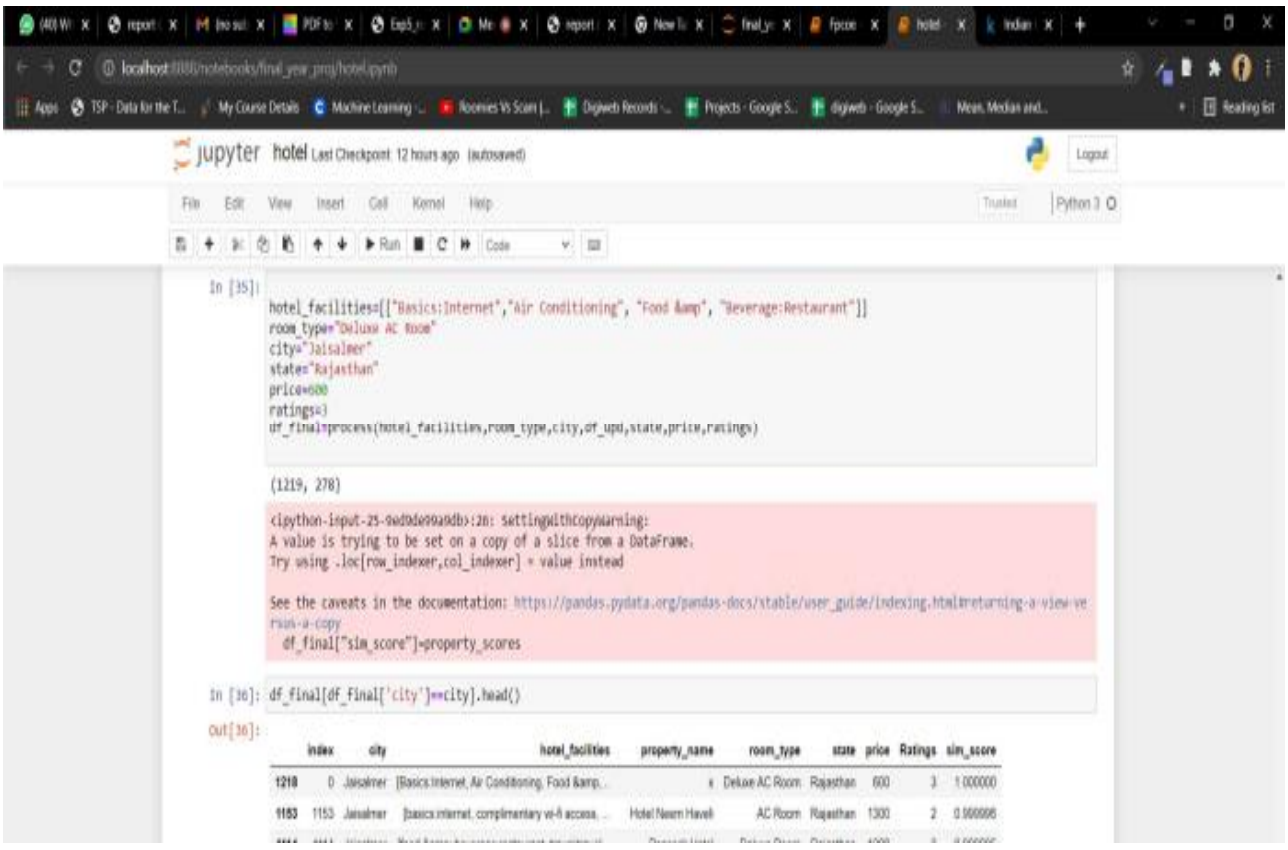

Fig 1 : Step 1

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Step 2: The datasets for the restaurants is loaded and pre-preprocessed along with proper analysis and then by applying the Collaborative Filtering Technique ,the resultant recommendations are stored in the final dataframe according to the cuisine preferences given by the user.

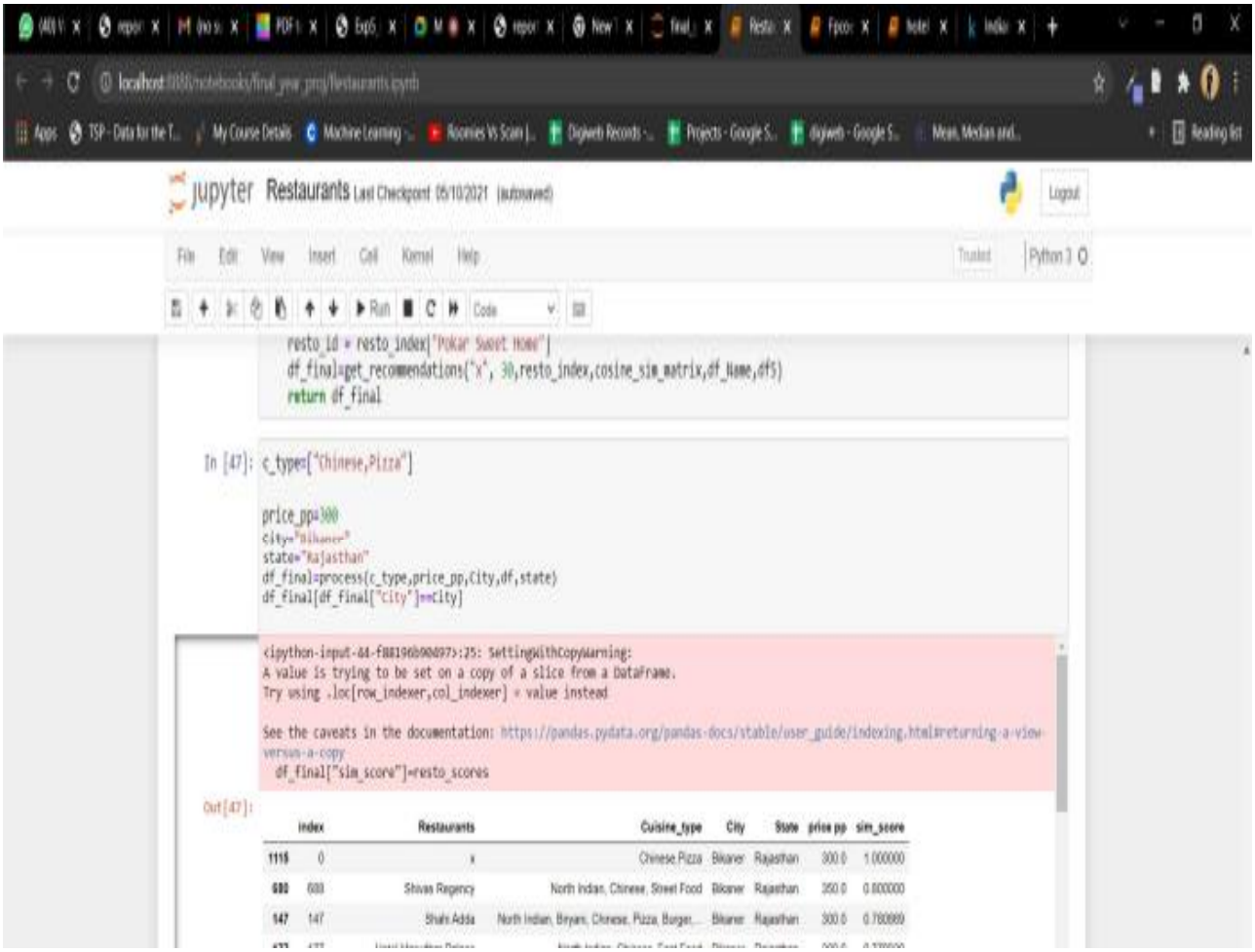

Fig 2: Step 2

Step 3: The datasets for the attractions is loaded and pre-preprocessed along with proper analysis and then by applying the Collaborative Filtering Technique ,the resultant recommendations are stored in the final dataframe according to the categories given by the user.

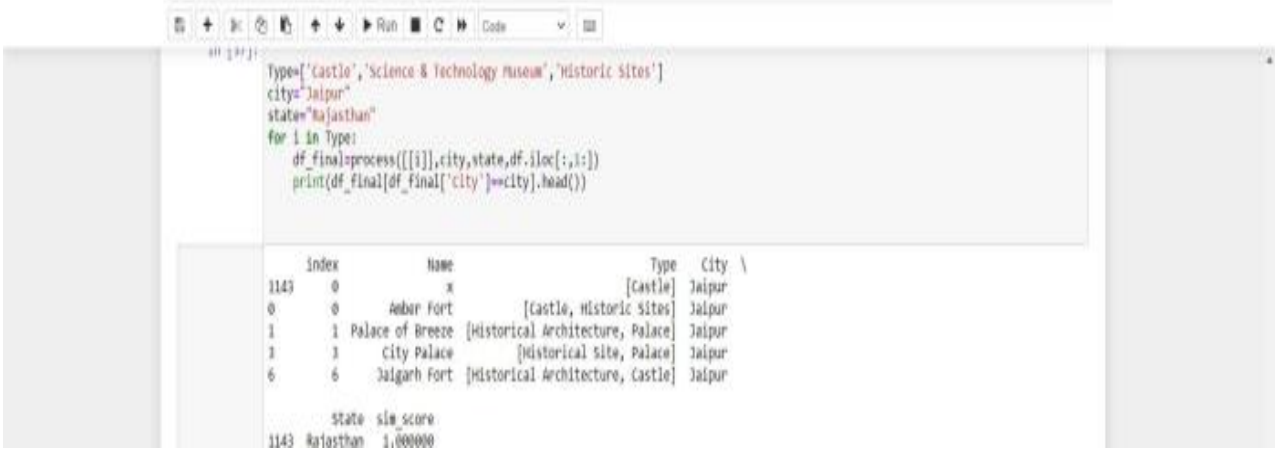

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Fig 3: Step 3

Step 4: The following image describes the UI of our web application where the user can give in their preferences and basic travel details for providing them a tailor made travel plan.

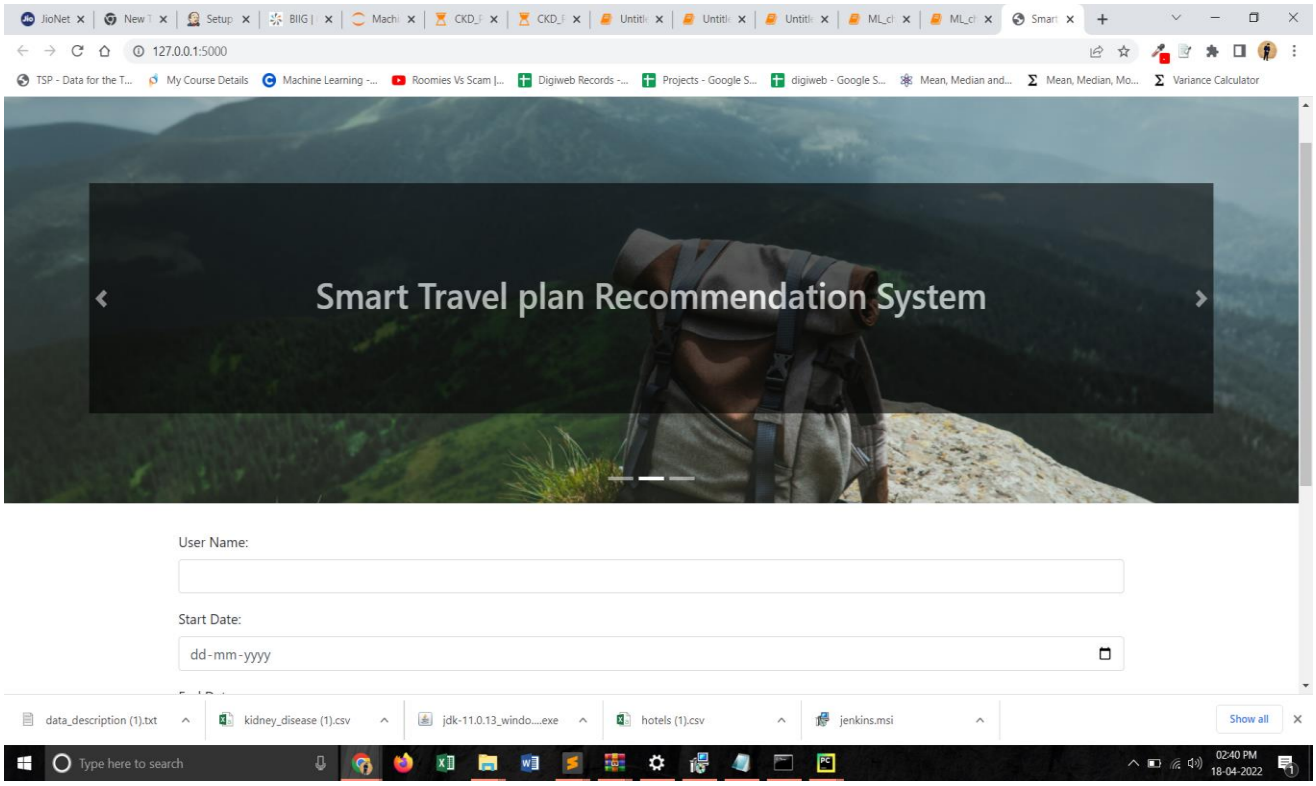

Fig 4: Step 4

Step 5: The following is a representation of restaurants section where we take the input of cuisine types which the user would like to have to provide with the suitable recommendations.

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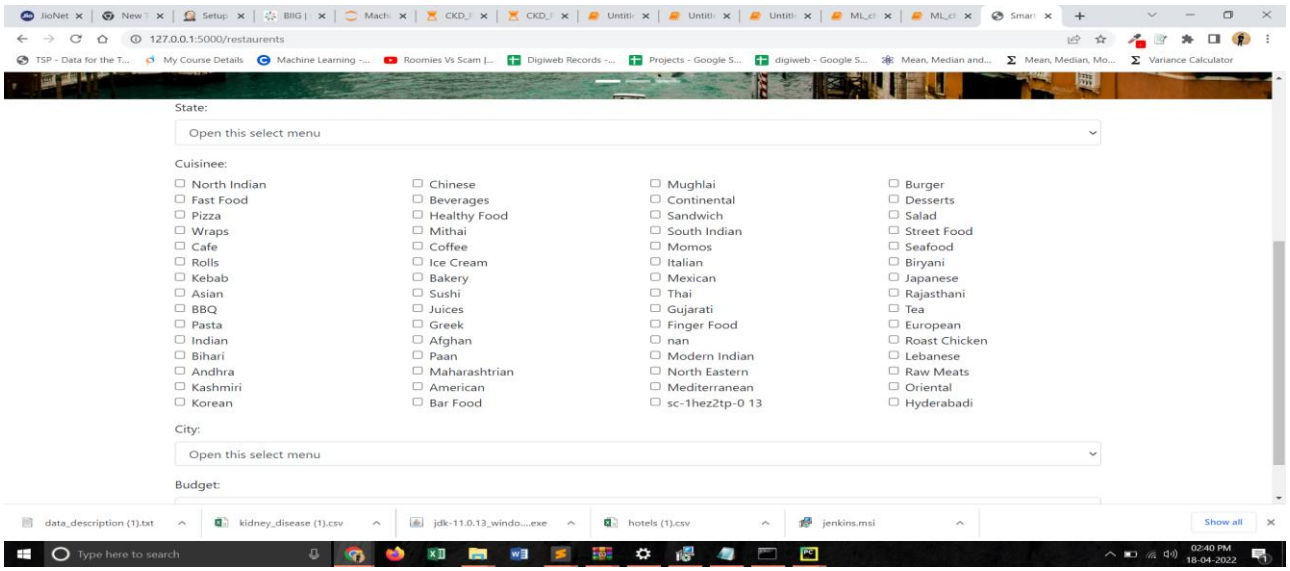

Fig 5: Step 5

VII. CONCLUSION

Traditional travel route planning fails to meet the user's personal interest and generates only highly ranked recommendations. Several methods that are used in recommendation systems were examined and it was found that to overcome the drawbacks of traditional travel systems, This Recommendation System that uses methods like collaborative filtering and Travelling Salesman Problem. This system can be a boon for the common people as it would save their valuable time for planning a vacation .

VIII. ACKNOWLEDGMENT

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