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BUILDING A RECOMMENDOR SYSTEM FOR HOTELS IN THE CITY OF BENGALURU

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INTRODUCTION:

Bengaluru is the capital city of the state Karnataka. With a population of over 21 million (as of March 2018), Bengaluru is the third largest city in India and 27th largest city in the world.

The diversity of the cuisine available is reflective of the social and economic diversity of Bengaluru. It being a cosmopolitan city, gives a foodie a multitude of options starting from Roadside food vendors to tea stalls to continental food to Chinese and Western Foods apart from being home to a multitude of Indian cuisines. Bengaluru is predominantly famous for its Udupi restaurants which largely welcomes vegetarian and vegan crowds alike. Bangalore can also be called a foodie's paradise because of its vast variety of foods and edibles with a touch of Bangalore's uniqueness and tradition.

OBJECTIVE:

As someone who travels very often to different locations and am met with unfamiliar environment more often than not, the lack of local knowledge about choice of restaurants, cuisines etc has caught me unaware more often than not. In such situation the presence of a recommender system which will give me information the following factors:

- Choice of cuisines in the local restaurants
- Recommendations of good hotels based on reviews
- Similar restaurants nearby
- If there are multiple “similar restaurants” nearby, what’s the average piecing in that restaurant? How is it different from my other options?

SCOPE:

The goal of this recommendation engine is to answer the following questions:

- What types of restaurants are present in a particular locality?
- What are the other similar options in the locality based on cuisine preference?
- How do different restaurants rank with respect to my preferences?

TARGET AUDIENCE:

There is no specific class of audience for this recommender system. This will definitely help someone who is travelling, or in a new location identify what their options are based on cuisine preference.

SUCCESS RATE:

With the advent of a huge population increase in cosmopolitan cities, there is almost a new restaurant or eatery that pops up almost every single day. The lack of a recommender system that focuses on the newly introduced cuisines, popular dishes or some of the must try’s is an inconvenience for tourists who may not have a great idea about the local food space and may not know the right people to ask about the same. Putting to use the various machine learning techniques, a recommender system which will cater options based on our preferences will be welcome by the common crowd in general.

DATA REQUIREMENTS:

1. Geographical coordinates – latitude and longitude of restaurants
2. Demographics (population) in the location of the restaurant
3. Average income of neighbourhood to know how much is the restaurant worth.

JUSTIFICATION FOR DATA REQUIREMENTS:

1. To access location of a restaurant, its Latitude and Longitude is to be known so that we can point at its coordinates and create a map displaying all the restaurants with its labels respectively.
2. Population of a neighbourhood Is a very critical detriment of the growth of the restaurant. The number of customers a restraint has is also determinantal of the popularity of the restaurant. Specific to this project, since ratings and reviews will be given by customers with different requirements, the population will be a critical factor in determining the accuracy of the recommender system.
3. Pricing plays a critical role in determining the popularity of a restaurant. Geographic location of a restaurant and the pricing scheme followed by the restraint is directly proportionate to the location of the restaurant. Higher the income of the average customer in a locality, greater the price of the food in the restaurant.

DATA COLLECTION:

1. https://en.wikipedia.org/wiki/List_of_neighbourhoods_in_Bangalore
2. https://indikosh.com/dist/655489/bangalore
3. https://en.wikipedia.org/wiki/List_of_Indian_cities_by_GDP_per_capita

Geographic Coordinates:

Borough	Neighborhoods	Latitude	Longitude
Central	Cantonment area	12.972442	77.580643
Central	Domlur	12.960992	77.638726
Central	Indiranagar	12.971891	77.641151
Central	Jeevanbheemanagar	12.962900	77.659500
Central	Malleswaram	13.003100	77.564300
Central	Pete area	12.962700	77.575800
Central	Rajajinagar	12.990100	77.552500
Central	Sadashivanagar	13.006800	77.581300
Central	Seshadripuram	12.993500	77.578700
Central	Shivajinagar	12.985700	77.605700

Population:

	Borough	Neighborhoods	Population	Normalized_population
0	Central	Cantonment area	866377	0.880810
1	Central	Domlur	743186	0.755567
2	Central	Indiranagar	474289	0.482190
3	Central	Jeevanbheemanagar	527874	0.536668
4	Central	Malleswaram	893629	0.908516

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Income:

	Borough	Neighborhoods	AverageIncome	Normalized_income
0	Central	Cantonment area	18944.099792	0.293051
1	Central	Domlur	56837.022198	0.879225
2	Central	Indiranagar	41991.817435	0.649581
3	Central	Jeevanbheemanagar	6667.447632	0.103140
4	Central	Malleswaram	53270.063892	0.824047

THE FOURSQUARE API:

The Foursquare API was used to find the nearest venues using a radius of 500 meters and clusters were created based n the same.

	Neighborhood	Borough	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
0	Cantonment area	Central	12.972442	77.580643	Hotel Fishland	12.975569	77.578592	Seafood Restaurant
1	Cantonment area	Central	12.972442	77.580643	Sapna Book House	12.976355	77.578461	Bookstore
2	Cantonment area	Central	12.972442	77.580643	Vasudev Adigas	12.973707	77.579257	Indian Restaurant
3	Cantonment area	Central	12.972442	77.580643	Adigas Hotel	12.973554	77.579161	Restaurant
4	Cantonment area	Central	12.972442	77.580643	Kamat Yatrinivas	12.975985	77.578125	Indian Restaurant

The following map is produced by marking all the neighbourhoods in Bengaluru city.

Out[14]: