Restaurant Recommendation System

IBM Capstone Project

Introduction:

Background: Database which is available is of restaurant of city Bangalore. There is very large diversity on different perspective like religion, language, education, food, etc. If we talk about the diversity of foods which are preferred by the different section of people in this city make the diversity to unite.

Problem: Suppose I travel and keep changing places very frequently.

This is very hectic and plus i get to experience very different types of environment, of which I do not have much knowledge about. In such situation, food can be an important factor for decided how you rate your trips and plus also recommending it to the people. Food can also attract people around to world to try it out if it were to be the best. In such scenarios, we need to find the right place, at reasonable cost, to serve us the best possible way.

1. How many types of foods are available in the restaurant?
2. Which is the most nearest to me with good rating?
3. How many "similar" restaurants are available nearby me?
4. Do the "similar" restaurants cost more? If so, what specialty do that have?

With restaurants evolving, new food categories emerge, hybrid food starts to be more popular, we need a system that could help us access vast number of food varieties. It is impossible for a person to ask each and every one about their visit to a particular place and also not everyone remembers everything. On the other hand, Computers are good at remembering things, and with Machine learning to its peak, it high time technology will by our personal guidance and help us personally based on our likes and dislikes. So people would care about this project as their personal assistance and success rate could certainly increase with time.

Data Collected:

1. **Borough ,Neighbor Database**: 8 borough and 64 Neighbor

	Neighborhood	Borough
0	Cantonment area	Central
1	Cantonment area	Central
2	Cantonment area	Central
3	Cantonment area	Central
4	Cantonment area	Central

2.Income By Neighbor:

	Borough	Neighborhoods	Latitude	Longitude	Population	City	AverageIncome
0	Central	Cantonment area	12.972442	77.580643	866377	Bangalore	18944.099792
1	Central	Domlur	12.960992	77.638726	743186	Bangalore	56837.022198
2	Central	Indiranagar	12.971891	77.641151	474289	Bangalore	41991.817435
3	Central	Jeevanbheemanagar	12.962900	77.659500	527874	Bangalore	6667.447632
4	Central	Malleswaram	13.003100	77.564300	893629	Bangalore	53270.063892

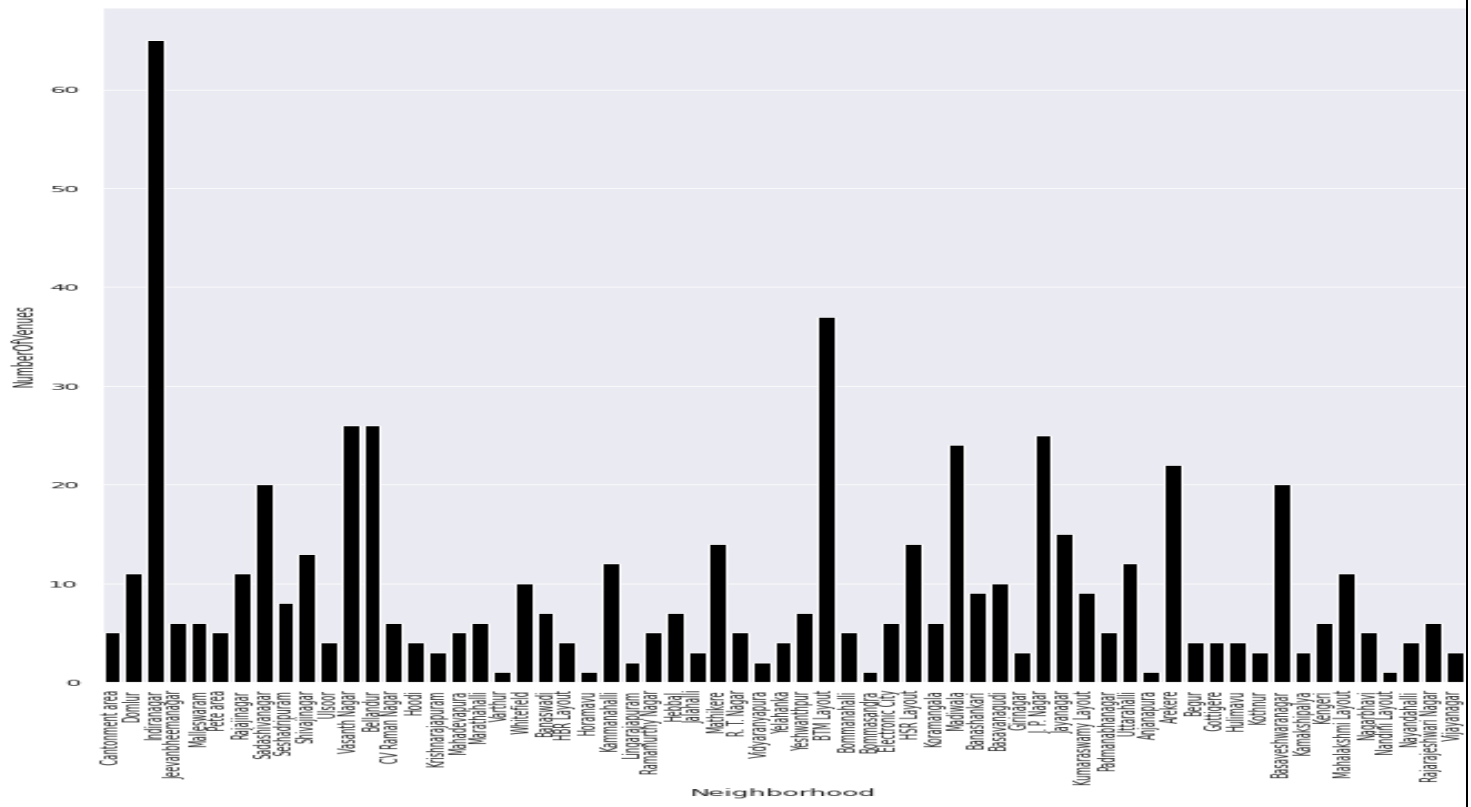
3.Foursquare API:

	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	Adigas Hotel	12.973554	77.579161	Restaurant
3	Cantonment area	Central	12.972442	77.580643	Vasudev Adigas	12.973707	77.579257	Indian Restaurant
4	Cantonment area	Central	12.972442	77.580643	Kamat Yatrinivas	12.975985	77.578125	Indian Restaurant

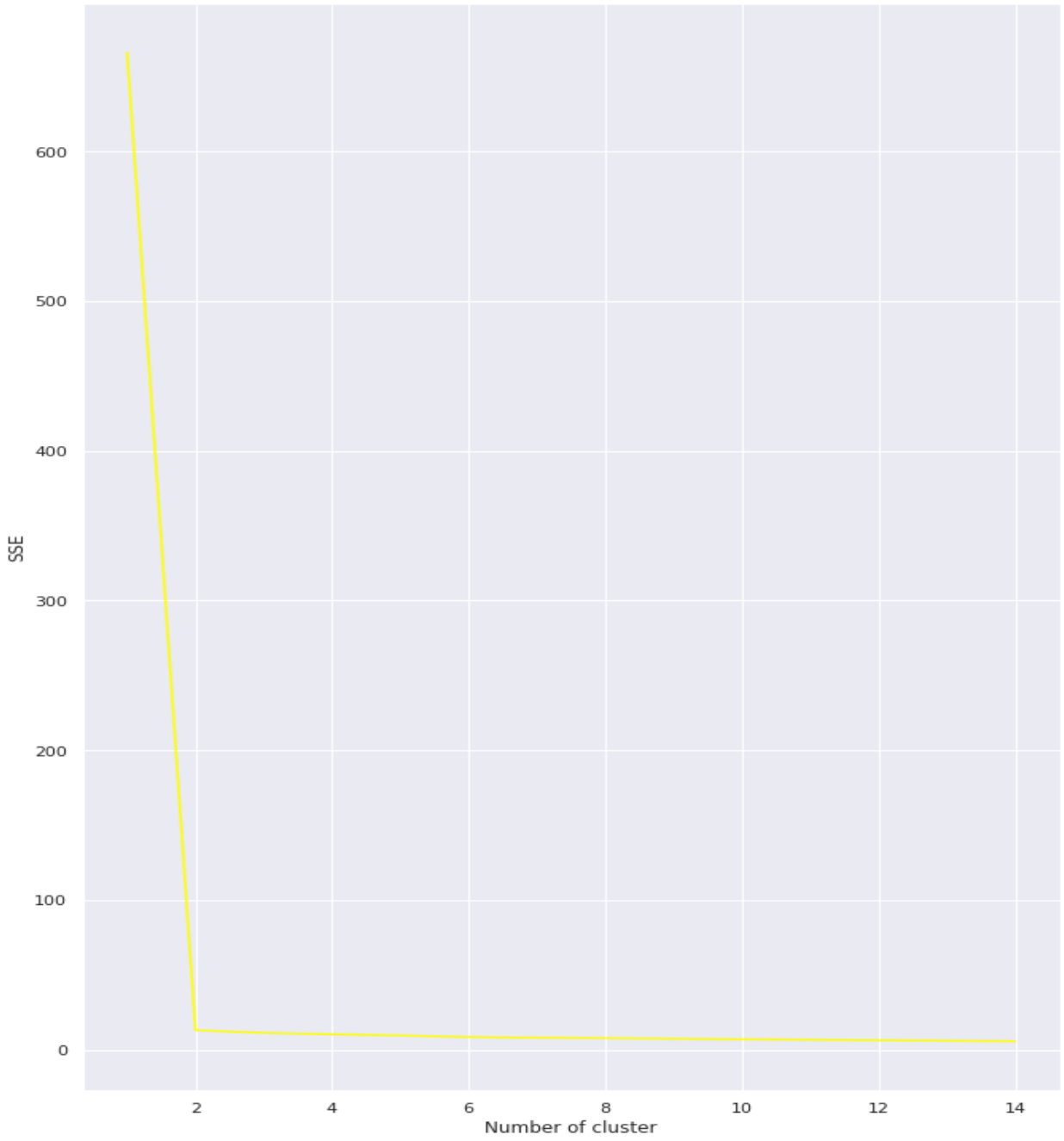
PROCESS:

Exploratory analysis

Damjour has most number of venues while Nandini Layout has the least.



I produced a graph to explore all the values for n_clusters and then finding the best by exploring the elbow:



3. Result :

The result of the recommender system is that it produces a list of top restaurants and the most common venue item that the user can enjoy. During the runtime of the model, a simulation was done by taking ‘Whitefield’ as the neighborhood and then processed through our model so that it could recommend neighborhoods with similar characters as that of ‘Whitefield’.

	Neighborhoods	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	Ranking
0	Arekere	Venue Category_Sporting Goods Shop	Venue Category_Indian Restaurant	Venue Category_Pizza Place	[0.32959888840700624]
1	BTM Layout	Venue Category_Indian Restaurant	Venue Category_Coffee Shop	Venue Category_Ice Cream Shop	[0.6918117751640321]
2	Banashankari	Venue Category_Café	Venue Category_Clothing Store	Venue Category_Shoe Store	[0.8234029969357847]

4.Conclusion :

The recommender system is a system that considers factors such as population, income and makes use of Foursquare API to determine nearby venues. It is a powerful data driven model whose efficiency may decrease with more data but accuracy will increase. It will help users to finish their hunger by providing the best recommendation to fulfil all their needs.