The Battle of Neighborhoods

REPORT ON THE MOST FAVOURED CUISINES IN BENGALURU

Venkatesh Kocherlakota | IBM – Coursera – Capstone Project | 25 April 2020

1. Introduction

1.1 Background

In modern times, due to the advances in communication, people all around the world have become one big family. Exchanging of information has led to the discovery of each other's culture and attracted new folks. At present scenario, we have all major cities having people from diverse cultures living. This is an opportunity for businesses as each group of people have their own preference based on their culture. For this assignment, lets focus on the city of **Bengaluru**.

Especially, when it comes to food, we now have different cuisines available based on the preference of customers. But the problem now is we have a lot of competition built up as well. Not having a good start might have unexpected results and may also lead to failure.

Hence, proper analysis must be done before opening a Restaurant of a specific cuisine and choosing the right location is crucial for success.

When thinking of starting a new business, it is important to analyze the market we are stepping into so the business strategies can be fine-tuned for best results.
Considering Bengaluru, **the Silicon Valley of India** we have people settled there from many cultures and regions.

From this itself we can infer that we would have a wide range of tastes.

1.2 Problem Description

When entering the world of Restaurants, it is important to find the pulse of people. Knowing which cuisines are preferred by majority can help business Pivot accordingly to need while maintaining good results.

Even though we have diverse people residing in Bengaluru, it is important to note that the city is still adapting to different cuisines. We have foodies who prefer western cuisines while some prefer traditional.

Opening a restaurant of specific cuisine requires a lot of factors to be considered such as Neighborhoods which have highest demand for the cuisine and the profits that can be earned.

Hence the goal here is to find the most profitable Cuisines as well as the areas with high demand for the same.

2. Data Acquisition and Cleaning

2.1 Data Sources

The sources for Data used in the Analysis are as follows:

For the details of different restaurants and cuisines, the data is extracted from a Kaggle Dataset whose link is given below:

URL: https://www.kaggle.com/ngokulakannan/zomato-india-restaurants2-lakh-restaurants-data

The above dataset provides us important details such as restaurants present in each city in India as well as details such as Latitude, Longitude, Rating of the restaurant, the cost for two and so on.

The data related to the neighborhoods of Bengaluru are extracted from the below link using Web Scraping:

URL: https://en.wikipedia.org/wiki/List_of_neighbourhoods_in_Bangalore

2.2 Data Cleaning

The first dataset considered is the Kaggle dataset on the Indian Restaurants. It has data about 225,000 restaurants across India. The columns present in this dataset are:

Zomato URL, name, city, area, rating, rating count, telephone, cuisine, cost for two, address, timings, Online Order, table reservation, delivery only, famous food, longitude and latitude

Out of these columns, the columns of interest are as follows:

city, name, area, rating, cuisine, cost for two, famous food, longitude, latitude

This huge dataset is first loaded into a Pandas Data frame and only the required columns are kept deleting the rest. Then, the data related to Bengaluru is filtered and loaded into a separate data frame.

Then the final step would be to remove Restaurants that had 0 ratings as well as no data related to cost for two. These two are going to become crucial factors for decision making in the coming sections.

2.3 Feature Selection

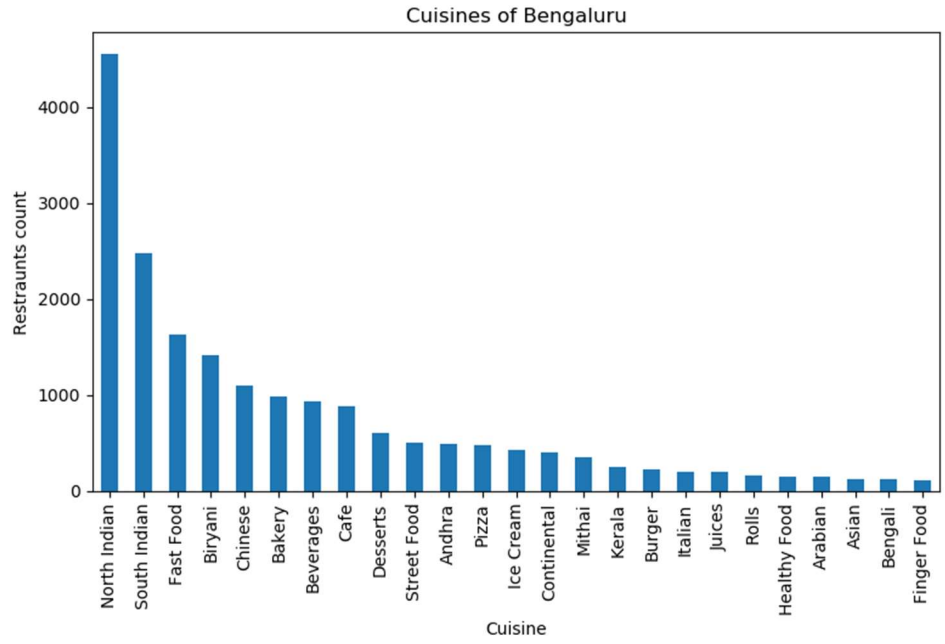
The main deciding factors for this analysis would be the *user ratings*, the *cuisines* of the restaurants and the *cost for two* value of the restaurants.

- **User Ratings:** These decide the restaurant's profit and the user's liking to a cuisine.
- **Cuisines:** These describe the cuisines that the restaurants mainly offer.
- **Cost for Two:** This is the cost associated with the dishes served by the restaurant. It is useful for classifying if the cuisine served is affordable.
- **Location:** The location details of the restaurant. This helps in analyzing the competition in each neighborhood.

3. Exploratory Data Analysis

3.1 Exploring Cuisines in Bengaluru

From the cleaned dataset, the number of restaurants per cuisine provides the competition offered for each cuisine. This can be obtained by classifying restaurants based on cuisines and counting the number of restaurants present per cuisine. The results upon classifying are as follows. Here, only the top 25 cuisines are shown in descending order:



From the above visualization, it can be inferred that the cuisines with most restaurants are North Indian and South Indian whose number of restaurants crossed 2000. These cuisines cannot be used for profit as the restaurants could be spread across Bengaluru.

Upon further observing the bar graph, the next most restaurants present for a particular cuisine are:

- Fast Food
- Biryani
- Chinese
- Bakery, etc.

Now, if we take international cuisines into consideration, a wider population can be targeted. Hence, regional cuisines can be excluded from the list as Bengaluru is home for people from many countries and cultures as well.

Then, the list can be shortlisted to:

- Italian
- Ice cream
- Burger
- Bakery
- Continental
- Chinese

From the above cuisines, Chinese is also a common cuisine and is served in almost all restaurants. Hence, even Chinese is excluded. Then the list would shorten to:

- Italian
- Continental
- Burger
- Bakery
- Ice cream

Now, for these cuisines, finding the average rating as well as the average cost per two can be helpful in further shortlisting.

Upon calculating the mean of the ratings of all restaurants serving these cuisines, it can be understood that the obtained rating would be a measure of how interested people are in the cuisine as people would give a lower rating if they do not like the cuisine.

All further analysis is done assuming the rating is given only based on the interest of the people and the restaurants delivered food of fine quality.

Upon calculating the average rating as well as the average Cost for Two for each of the cuisines, the results are tabulated as follows:

Cuisine	Average Rating	Average Cost for Two
Italian	3.85	914.43
Ice Cream	3.74	254.3
Burger	3.67	434.6
Bakery	3.56	358.2
Continental	3.88	1084.75

On comparing these with the cuisines with the most restaurants, it can be inferred that even though the number of restaurants is high, the rating is comparatively low.

The table for comparison is as follows:

Cuisine	Average Rating	Average Cost for Two	Number of Restaurants
Continental	3.88	1084.75	396
Italian	3.85	914.43	201
Ice Cream	3.74	254.3	429
Burger	3.67	434.6	224
South Indian	3.57	288.48	2476
Bakery	3.56	358.2	978
North Indian	3.54	498.28	4550
Fast Food	3.51	289.53	1633

Now from the above table, the most rated cuisines are Continental, Italian followed by Ice cream and Burger.

Now upon looking at the Average Cost for Two, Continental seems to be too pricy and since Bengaluru is still adapting to newer cuisines, there is a high chance that people might not prefer this cuisine as its price is relatively high compared to other cuisines. Hence, Continental can be excluded from the list.

The cuisine with least average price in the list is Ice cream but for that price, the number of restaurants is high as competition would not allow major profits. This would further boil down the list to Burger and Italian. Even though Italian Average Cost for Two is high, its rating is high, and the number of restaurants is relatively low. This can mean that there is a decent amount of demand for Italian. And coming to Burger, it would be an ideal choice as its rating average cost and the number of restaurants are relatively favoring.

Hence, it can be concluded that the most favorable cuisines for a profitable business are:

Italian and ***Burger***

3.2 Exploring Venues in Bengaluru

To get the details of venues in different neighborhoods of Bengaluru, Foursquare API is used.

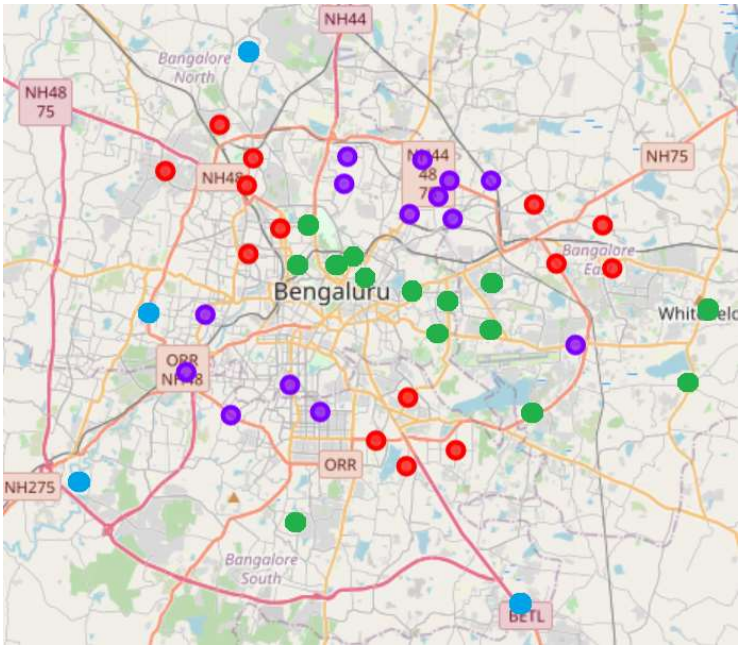
The below link is used for getting the details of the neighborhoods of Bengaluru:

https://en.wikipedia.org/wiki/List_of_neighbourhoods_in_Bangalore

There are 7 Boroughs and 47 Neighborhoods in Bengaluru. After web scrapping the required data and saving into a file, the data is then loaded into a Data frame.

Next using Foursquare API, the nearby venues for each neighborhood are requested and are then saved into a Data Frame. Then he venues are one-hot encoded into different venue categories provided by the API. This helps in quickly filtering out the neighborhoods with required venues.

Finally, k-means clustering is applied to the processed data to create clusters accordingly. Here k is chosen as 4 for simplicity. The output of the clustering is as follows:



	Cluster 1
	Cluster 2
	Cluster 3
	Cluster 4

4. Results

Upon looking at each cluster, the top 5 Venues for each are as follows:

S. No	Cluster	Burger Frequency	Italian Frequency	Neighborhoods
1	Cluster 1	Second and Furth Most Visited	First and Second Most Visited	Jalahalli, Mathikere, Peenya, Yeshwanthpur, Bommanahalli, BTM Layout, HSR Layout
2	Cluster 2	Eighth Most Visited	Ninth Most Visited	Horamavu, Kalyan Nagar, Kammanahallil, Hebbal, R. T. Nagar, Nayandahalli
3	Cluster 3	Not frequently Visited	Eighth Most Visited	Vidyaranyapura, Yelahanka
4	Cluster 4	Fifth Most Visited	Eighth Most Visited	Cantonment area, Jeevanbheemanagar, Shivajinagar, Vasanth Nagar, Varthur

Clearly, from the above findings, Neighborhoods present in Cluster 1 are more favorable as they have our Cuisines being most frequently ordered and the restaurants serving them are most frequently visited.

5. Conclusion

Hence, from the above analysis, the following can be concluded:

The Most profitable Cuisines to serve in Bangalore are:

1. Italian - Costly
2. Burger - Budget Friendly

The most suited Neighborhoods for Burger Cuisine are:

1. HSR Layout
2. Bommanahalli

The most suited Neighborhoods for Italian Cuisine are:

1. Yeshwanthpur
2. Jalahalli
3. Mathikere
4. Peenya