Best location for new restaurant in Bangalore, India

IBM Data Science – Capstone Project

By Cebe Chakaravarthi, January 25, 2020

1. Introduction

1.1 Business Problem

Bangalore is one of the third most populous and fastest-growing cities in India. This city has been known as the silicon city for years now, as it is the hub for IT Companies in the country. This fact has attracted over 5 million people to work and live in the city. Currently, the city is called the Startup capital of India. This fact attracts young talents from across the country, resulting in rapid urbanization and an environment that fosters business. As people find better jobs and better business opportunities, people are more willing to spend their money. Thus new business in Bangalore finds a better chance of success. This scenario makes Bangalore the best choice to start a restaurant. However, there are many localities in Bangalore which are already saturated and which are in the phase of development. This objective of the study is to analyze and find the best locality in Bangalore to start a new restaurant.

1.3 Target Audience

This study will be of help to entrepreneurs who are planning to start a restaurant or allied business in Bangalore and to the managers of restaurant chains to prepare for their next successful branch.

2. Data Description

2.1 List of data required

- List of localities in Bangalore with their coordinates
- List of venues and venue categories in the localities with their coordinates
- Current developments in the city of Bangalore

2.2 Data Sources

For this study, first, we need the list of localities in Bangalore with their coordinates. The list of localities is available in Wikipedia page 'https://en.wikipedia.org/wiki/Category:Neighbourhoods_in_Bangalore'.

With the name of the localities, we have to figure out the coordinate of the localities. This can be dome through python geo-locator API's. Further, we will obtain the venues, it's category and it's coordinates using 'Foursquare

API'. Foursquare has one of the largest database of 105+ million places and is used by over 125,000 developers. These data will be sufficient to evaluate the number of restaurants in each localities. Finally, we have to find the current developments in and around Bangalore. We have to analyze the news websites for this information.

3. Methodology

3.1 Localities – Data extraction, visualization and cleaning

As first step we use 'BeautifulSoup' library in python to scrape the Wikipedia webpage to arrive at the list of localities in Bangalore. We create a data frame with the list of localities. We then use the locality names to obtain their coordinates using the 'Python Geo-locator' library. This coordinate for each locality is appended along with the data frame. The resultant data frame is as below (fig 3.1) with

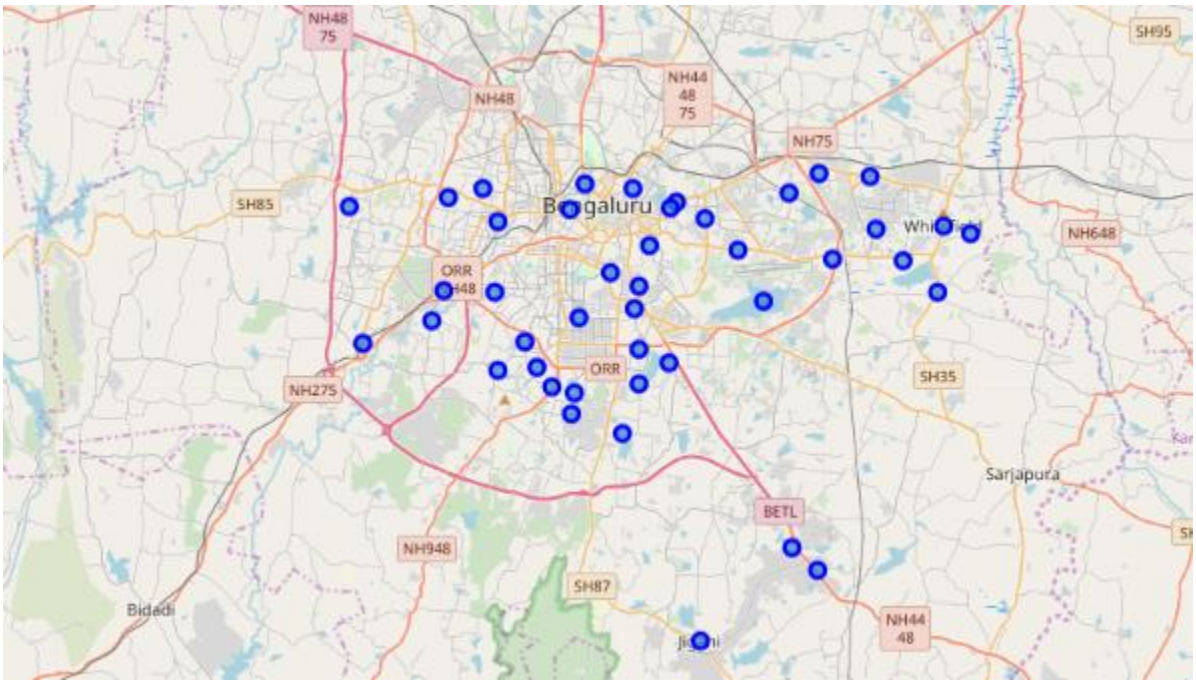
Neighborhood	Latitude	Longitude
Adugodi	12.942847	77.610416
Arekere	12.881274	77.615294
Banashankari	12.888475	77.538571
Banaswadi	12.936439	77.666984
Basavanagudi	12.978571	77.477858
Basaveshwaranagar	12.899593	77.610317

While we try to obtain the coordinates of the localities, we are faced with two challenges.

1. The Geo-locator does not provide the coordinates for locality name.
2. The locality is far away from the city limits

Since the number of localities for which coordinates are not available are very few, we could manually search for the coordinates and add it to the data frame. But for this project, we shall ignore these localities without coordinates and shall be considered as scope for further study.

For the second challenge, we address by limiting the latitude and longitude range within the city limits. We then visualize the localities in a map using 'folium' maps library in python. The resultant map is as below (fig 3.2).



3.2 Obtaining & processing venues and venue category in each locality

To obtain the nearby venues and venue categories in the localities we use the Four Square API. We choose a radius of 3km. As we list the venue category, we find the restaurants are with various names such as Burger Joint, Breakfast Spot, Indian restaurant, Asian Restaurant, etc. We have to consider all these categories as restaurants. So we filter out all the venues with a name related to restaurant and create a separate data frame.

3.3 Finding the restaurant density in each locality

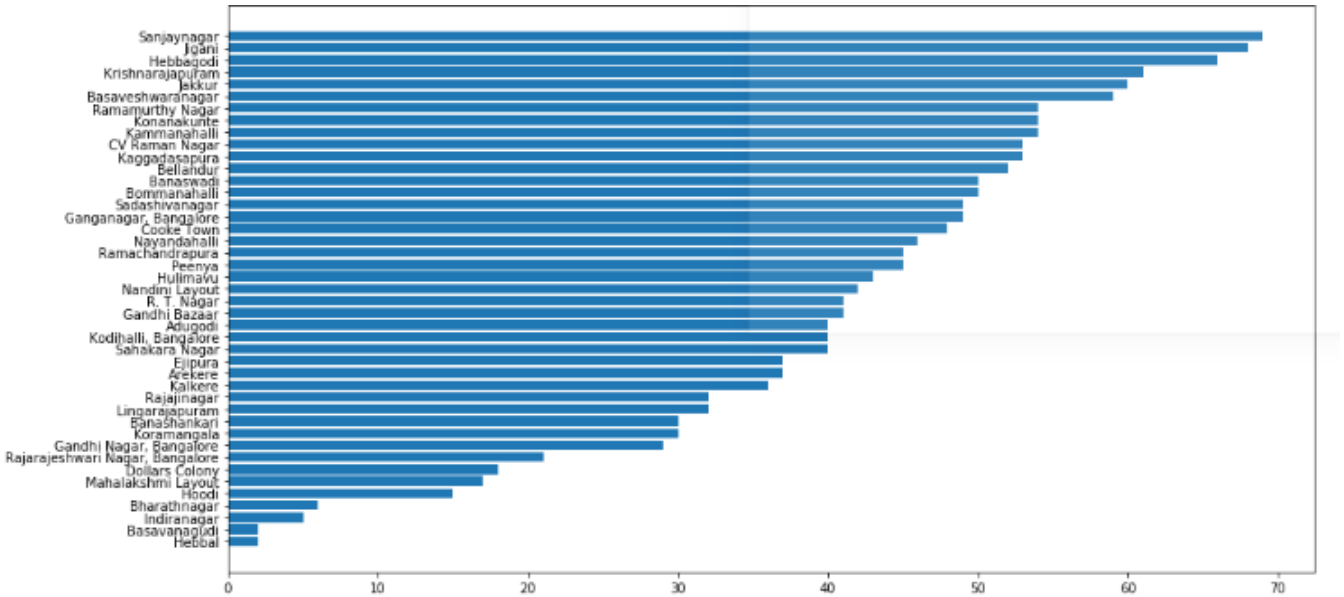
The resultant data frame will contain the locality name and the restaurant count. The restaurant count is for the area of radius 3km. We then arrange the rows in the ascending order of restaurant count. The resultant data frame is as below (fig 3.3).

	Neighborhood	Restaurant Count
17	Hebbal	2
4	Basavanagudi	2
20	Indiranagar	5
7	Bharathnagar	6
18	Hoodi	15

We will discuss the observations and results in the result section of this report

4. Results

We plot the localities and the restaurant count in a bar chart using 'python matplotlib' library. We prepare a bar chart with the locality name in the Y axis and restaurant count in the X axis. With the bar chart we can find that areas such as Sanjaynagar, Jigani with more than 70 restaurants have the highest density of restaurants while Hebbal and Basavangudi with single digit restaurants have the least restaurant density compared to the rest of the localities. The resultant bar chart is as below (fig 4.1).



5. Discussion

From the bar chart it is clearly evident that places with low restaurant counts has huge potential to start a new restaurant considering the influx of immigrants from neighboring state. But with only this data it is perilous to conclude that Hebbal, Basavangudi, Indiranager and Bharathnagar are the best places to start a new restaurant because these areas might be an industrial area or some area unable to be occupied. So the places suggested by our study have to be co-related with the current developments in the city such as metro rails, airport, IT parks, etc.

When analyzing the current affairs in the city, the most important aspect that pops up is the development of new airport in Bangalore near an area called Devanahalli. In a city an airport increases the activities in all the nearby areas. It triggers development of hotels, IT parks etc. By analyzing the closeness of the localities in the list most nearest to the airport – Hebbal turns out to be the gateway between the Airport and the rest of the city. Below is the article which talks about the real estate and infrastructure development in Hebbl - https://economictimes.indiatimes.com/news/politics-and-nation/hebbal-gets-international-airport-tailwind/articleshow/63475744.cms?from=mdr. Further the government is planning a metro rail in Hebbal - https://www.newindianexpress.com/cities/bengaluru/2018/oct/12/bengaluru-metro-airport-line-to-now-run-through-hebbal-1884445.html

Hence we can safely conclude that setting up a restaurant in Hebbal will give a better chance of success and also an early mover's advantage.

6. Conclusion

In this project, we have gone through the process of identifying the business problem, specifying the data required, extracting and preparing the data, sorting the data and lastly providing recommendations to the relevant stakeholders i.e. entrepreneurs and restaurant owners regarding the best locations to open a new restaurant. To answer the business question that was raised in the introduction section, the answer proposed by this project is: Hebbal – locality which is expected to have a rapid development as the most appropriate location to start a new restaurant. The findings of this project will help the relevant stakeholders to capitalize on the opportunities on high potential locations while avoiding overcrowded areas in their decisions to open a new restaurant.