Suggesting suitable location to live in "Silicon Valley of India – Bengaluru"

Ravi Singh Yadav

July 30, 2020

1. Introduction

1.1 Background

Bengaluru is the capital of the Indian State of Karnataka. It has a population of about 10 million and a metropolitan population of about 8.52 million, making it the third most populous city and fifth most populous urban agglomeration in India. Bengaluru is home to infotech companies like Wipro, Infosys. Many MNCs like Google, Apple have their branches here too, making it very popular for job seekers. Industrial infrastructure, engineering education and industrial policy are some other reasons which help it to become a Tech hub. About 35% of India's pool of IT professionals are in Bengaluru. Now, Bengaluru is not just an IT Hub but it is also the hub of other industries like aeronautics, space research and defence research. It is also the one of the best places for engineering education, thus attracting a lot of students every year. These makes the Bengaluru favourite city among job professionals and students to reside at. Therefore, it will be great help for the professionals if they would know the best location to reside at.

1.2 Problem

 It is difficult for the students and professionals to choose the best location to reside at according to their needs and status and taking important factors in account like whether they are married or not , they have kids or not , they have a joint family or not and the facilities required by all of them like school for kids , hospital for elderly people , restaurants for bachelors etc. This project aims to use all the above information and decide the best location for residence.

1.3 Interest

People shifting to Bengaluru from other places or people changing the location inside Bengaluru will be very much interested in knowing the best suitable location for them. Students and IT professionals would be the most interested people in this project.

2.Data

2.1 Data Acqiusition

The postal code data of Bengaluru was obtained from the website
https://www.mapsofindia.com/pincode/india/karnataka/bangalore/ .

The above website has the data of Loaction, Postal Code , District , State .

The required data was obtained from the website.

The latitude and longitude data of the locations were obtained by using the GeoPy library of Python.

The details of the venues were obtained by using "Foursqure API" . The Foursquare API is a RESTful API and is currently used by 100,000 developers and is used by many companies like Apple Maps , Uber , Snapchat etc. Every developer has a unique CLIENT ID and CLIENT SECRET which is used for making calls to the Foursqaure Database. The data provide by Foursquare also includes the category of the venue with a lots of other information like latitude and longitude of venues . The category of a venue will tell us decide that for what kind of people is that venue useful. The project will check the category of all the venues within the given radius of a location and thus assigning the each category to a particular group of people , for example , School is for kids , College and University of Senior Students , Restaurants , Pubs , for Bachelors as well as married , Therapy and Massage Centres for Elderly people , similarly all the categories in the received data will be assigned to group of peoples and then using a combination of all of this to suggest the best location where all the required venue categories are available.

2.2 Feature Selection

As Foursquare API was used to search for the particular type of categories around the locations for each type of categories.

For Analysis of location for Joint Families which include Adults , Elderly Persons and kids, following venue categories were selected:

```
bnglu_venues["Venue Cat"].unique()

array(['Hospital', 'High School', 'Middle School', 'School',
       'Nursery School', 'Garden', 'Music School', 'Park', 'Plaza',
       'Pet Service', 'Preschool', 'Language School', 'Elementary School',
       'Emergency Room', 'Driving School', 'Adult Education Center',
       'Religious School', 'Private School', 'Tech Startup'], dtype=object)
```

For Analysis of location for Bachelor Job seekers following categories were selected:

```
In [46]: bach["Venue Cat"].unique()

Out[46]: array(['Cocktail Bar', 'Fast Food Restaurant', 'Indian Restaurant',
                'Andhra Restaurant', 'Beer Garden', 'Cafeteria',
                'Food & Drink Shop', 'Karnataka Restaurant', 'Bar', 'Wine Bar',
                'South Indian Restaurant', 'Chaat Place', 'Dhaba', 'Whisky Bar',
                'Other Nightlife', 'Hotel Bar', 'Farmers Market', 'Grocery Store',
                'Laundry Service', 'Liquor Store', 'Udupi Restaurant',
                'Szechuan Restaurant', 'Breakfast Spot', 'North Indian Restaurant',
                'College Cafeteria', 'Multicuisine Indian Restaurant', 'Brewery',
                'Nightclub', 'Fish Market', 'Snack Place', 'Butcher',
                'Punjabi Restaurant', 'Department Store',
                'Maharashtrian Restaurant', 'Vegetarian / Vegan Restaurant',
                'Bakery', 'Indian Sweet Shop', 'Dry Cleaner', 'Pub',
                'Gourmet Shop', 'Kerala Restaurant', 'Indian Chinese Restaurant',
                'Dairy Store', 'Tennis Stadium', 'Sports Bar',
                'Middle Eastern Restaurant', 'Supermarket', 'Diner', 'Gay Bar',
                'Strip Club', 'Hotel', 'General Entertainment', 'Lounge',
                'Dive Bar', 'Wine Shop', 'Mughlai Restaurant',
                'Seafood Restaurant', 'Bengali Restaurant', 'Food',
                'Mediterranean Restaurant', 'BBQ Joint', 'Rajasthani Restaurant',
                'Health Food Store', 'Food Truck', 'Street Food Gathering',
                'Hyderabadi Restaurant', 'Parsi Restaurant', 'Asian Restaurant',
                'Hookah Bar', 'Music Venue', 'Northeast Indian Restaurant',
                'American Restaurant', 'Arcade', 'Chettinad Restaurant',
                'Organic Grocery', 'Restaurant', 'Food Service',
                'Chinese Restaurant', 'African Restaurant', 'Gastropub',
                'Italian Restaurant', 'Shopping Mall', 'Beer Bar', 'Irish Pub',
                'Café', 'Event Space', 'Beer Store', 'Cheese Shop', 'Karaoke Bar',
                'Coffee Shop', 'Thai Restaurant', 'Office', 'Juice Bar',
                'Kebab Restaurant', 'Mexican Restaurant', 'Speakeasy',
                'Nightlife Spot', 'Eastern European Restaurant',
                'Southern / Soul Food Restaurant', 'Dessert Shop'], dtype=object)
```
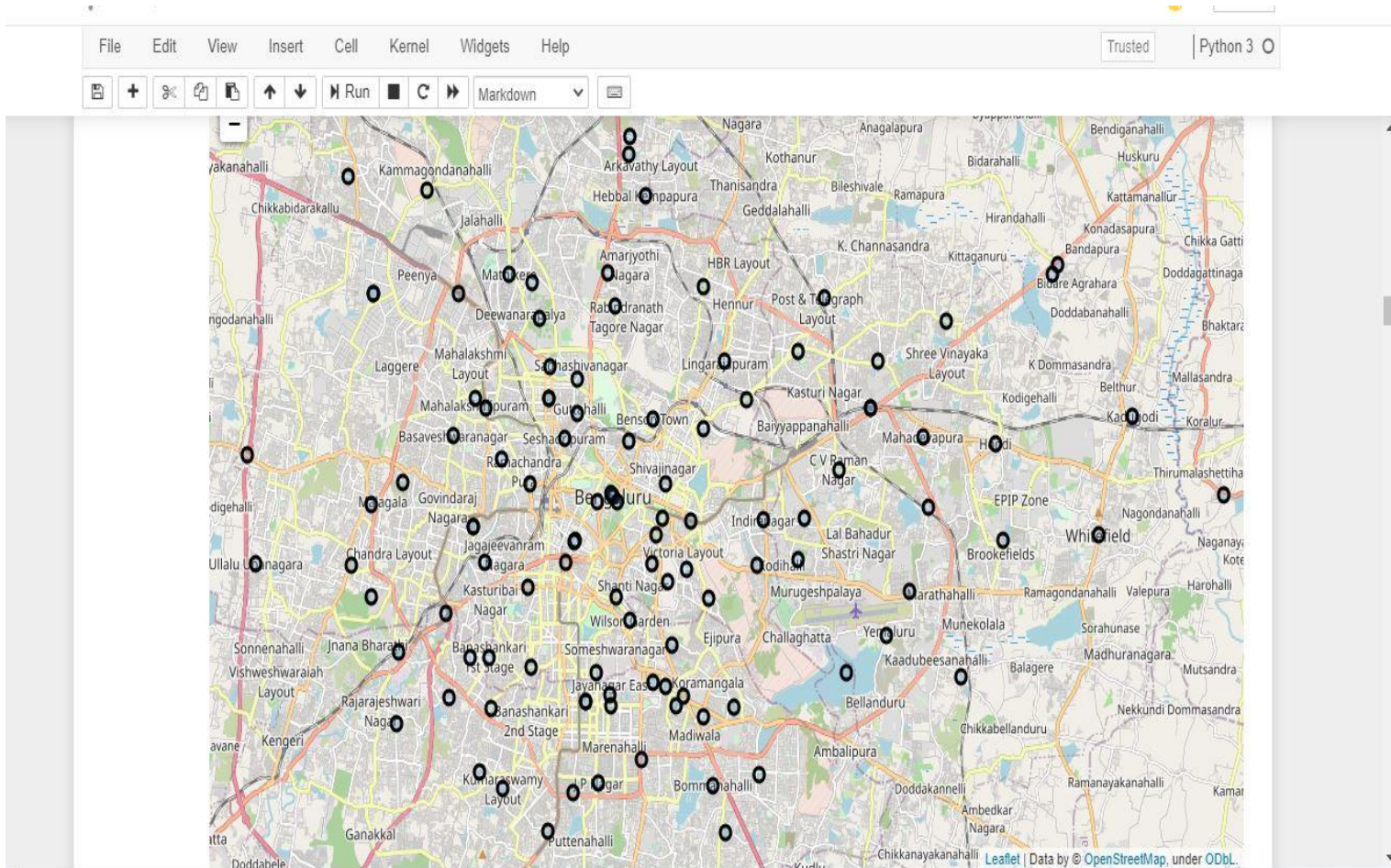
For analysis of college students following categories were selected:

```
In [45]: students["Venue Cat"].unique()

Out[45]: array(['College Administrative Building', 'Hostel', 'Student Center',
                'College Auditorium', 'College Academic Building',
                'College Library', 'College Classroom', 'University',
                'College Engineering Building', 'Medical School',
                'College Rec Center', 'College Cafeteria',
                'General College & University', 'College Technology Building',
                'Laundry Service', 'Bookstore', 'College Bookstore', 'College Gym',
                'College Residence Hall', 'Law School',
                'College Communications Building', 'Fraternity House',
                'Trade School', 'College Science Building',
                'College Basketball Court', 'College Lab', 'College Math Building',
                'Dry Cleaner', 'College Theater', 'College Arts Building',
                'College & University', 'College Soccer Field', 'College Quad',
                'Community College', 'Stationery Store', 'College Football Field',
                'College Hockey Rink', 'College Cricket Pitch', 'Hospital',
                'College Tennis Court', 'Hotel', 'Café', 'College Stadium',
                'College Track', 'Department Store', 'Tech Startup',
                'Electronics Store', 'Concert Hall', 'Library', 'Sorority House'],
              dtype=object)
```

3.Methodology (Visualizing the locations)

All the locations were plotted on the map of Bengaluru, Karnataka , India using the Folium Library.

4. Results

Locations were analysed based on the category of venues required and based on the availability of that particular categories and then looking for locations having most of the available locations and final results were announced.

4.1 For Joint Families

For joint families which include children and elderly person , venue categories that were used are mentioned in the Data Acquisition section, based on that top 5 location that were sorted for Joint families were:

1. Malleswaram
2. Vasanthnagar
3. JayaNagar
4. Madhavan Park
5. Mico Layout

4.2 For Bachelor Job Seekers

For Bachelor people the categories used are mentioned in Data Acquisition Section of the Report , based on that top 5 locations are :

1.Hosur Road

2. Brigade Road

3. Museum Road

4. HSR Layout

5. Koramangala I Block

4.3 For College Students

For College Students the categories used are mentioned in Data Acquisition Section of the Report , based on that top 5 locations are :

1. Msrit
2. Dharmaram College
3. Taverekere
4. Brigade Road
5. Museum Road

5.Discussion

As per observation we can see that Brigade Road and Museum Road are present in both the analysis of bachelors and students locations , so we can say that these two locations are most rich location in terms of availability of venues.

6. Conclusion

By looking at the projects it can be concluded that Bengaluru has adequate locations according to the needs of people moving there. It has huge number of opportunities as well as locations which will help in fulfilling them.