

Analysis of Restaurants near Hospitals in Bangalore, India

IBM Applied Data Science Capstone Project

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Business Problem

- Restaurants near Hospitals cater to the food needs of a large section of the people in the Hospitals including bystanders, staff and family and friends visiting the patient
- The objective of this capstone project is to analyse Hospitals in the city of Bangalore to get a statistics of the Restaurants around it
- Business Question: If a patient's family or bystander is looking for food venues, do they have enough options and if not, for investing in a new restaurant, where can we recommend it be opened?

Data

- Data Required
 - i. List of hospitals in Bangalore
 - ii. Latitude and longitude coordinates of those Hospitals
 - iii. Venue data, particularly data related to Restaurants

- From Foursquare API, the following is retrieved:
 - i. Name: The name of the venue
 - ii. Category: The category type as defined by the API
 - iii. Latitude: The latitude value of the venue
 - iv. Longitude: The longitude value of the venue



Sources of Data

- Wikipedia page for list of Hospitals in Bangalore
(https://en.wikipedia.org/wiki/Category:Hospitals_in_Bangalore)
- Geocoder package for latitude and longitude co-ordinates
- Foursquare API for venue data

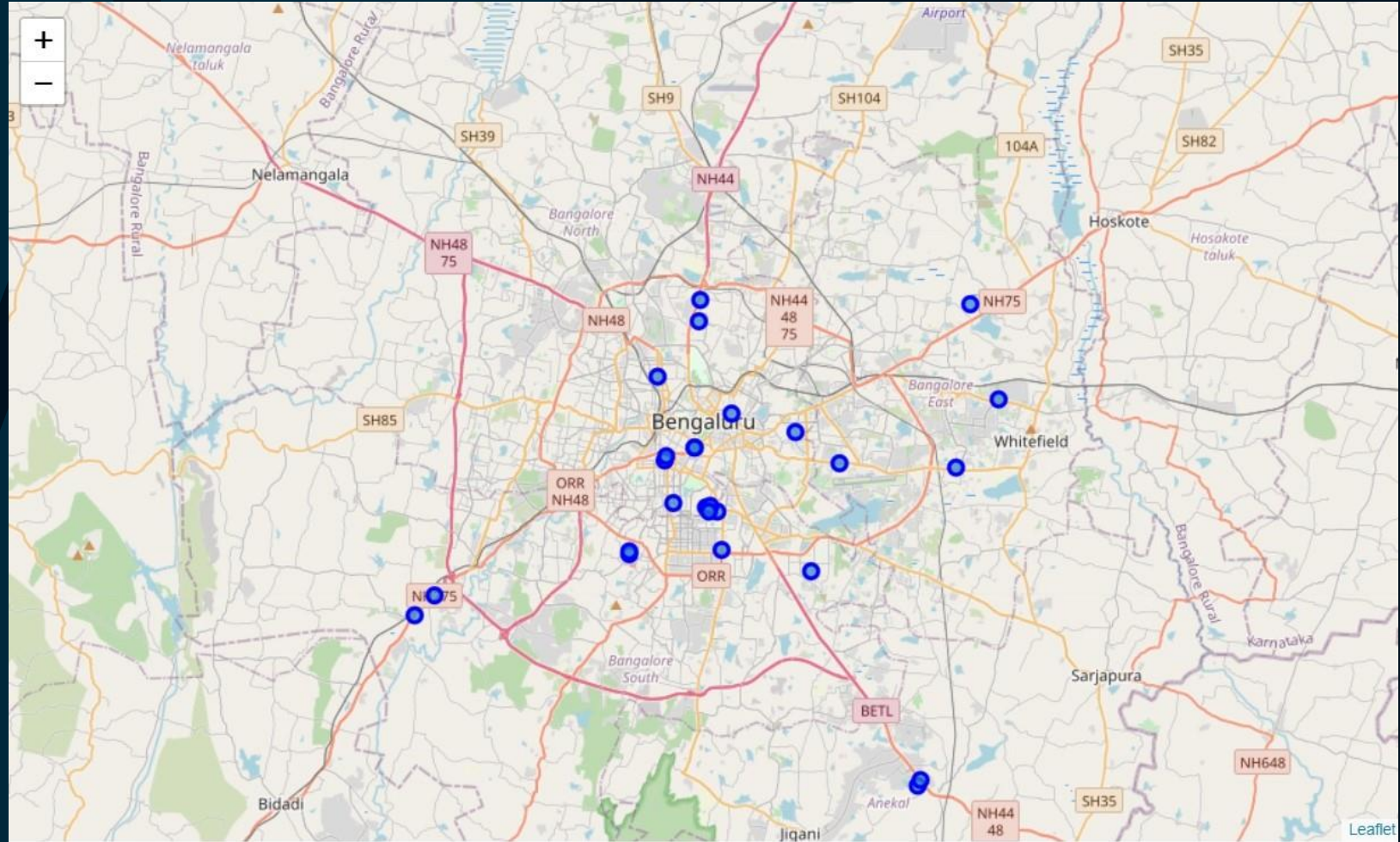
Methodology

- Web Scrapping Wikipedia page for Hospitals List
- Get latitude and longitude co-ordinates using Geocoder
- Use Foursquare API to get venue data
- Group data by Hospitals and taking the mean of the frequency of occurrence of each venue category
- Filter venue category by Restaurant
- Perform clustering on the data using K-Means Clustering
- Visualize the clusters in a map using Folium Package

Exploratory Data Analysis

A. Hospitals in Bangalore

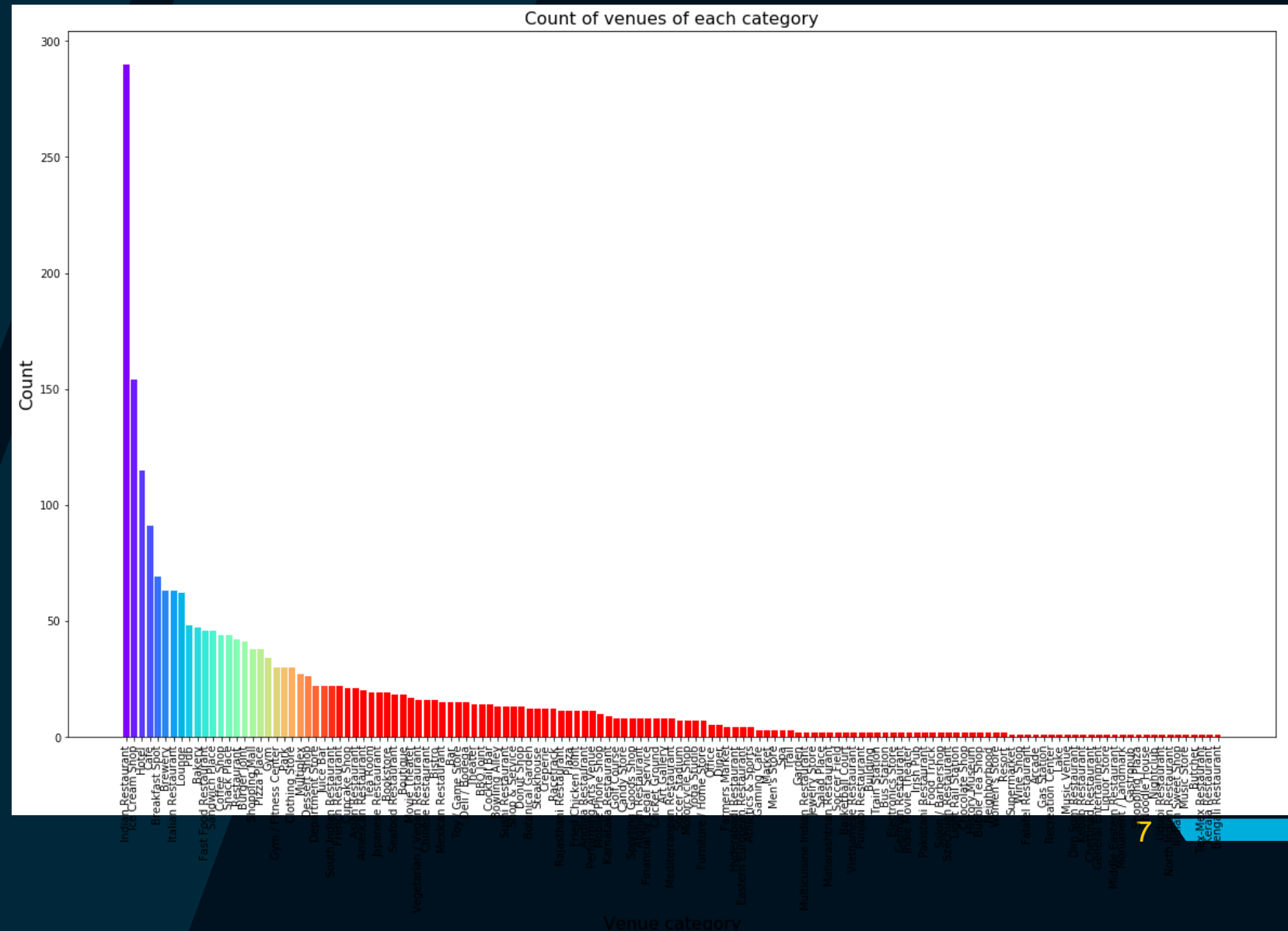
We get the geographical coordinates of Bangalore using the Geocoder package and add markers on it that show the location of the Hospitals



Exploratory Data Analysis

B. Venues in each category near Hospitals

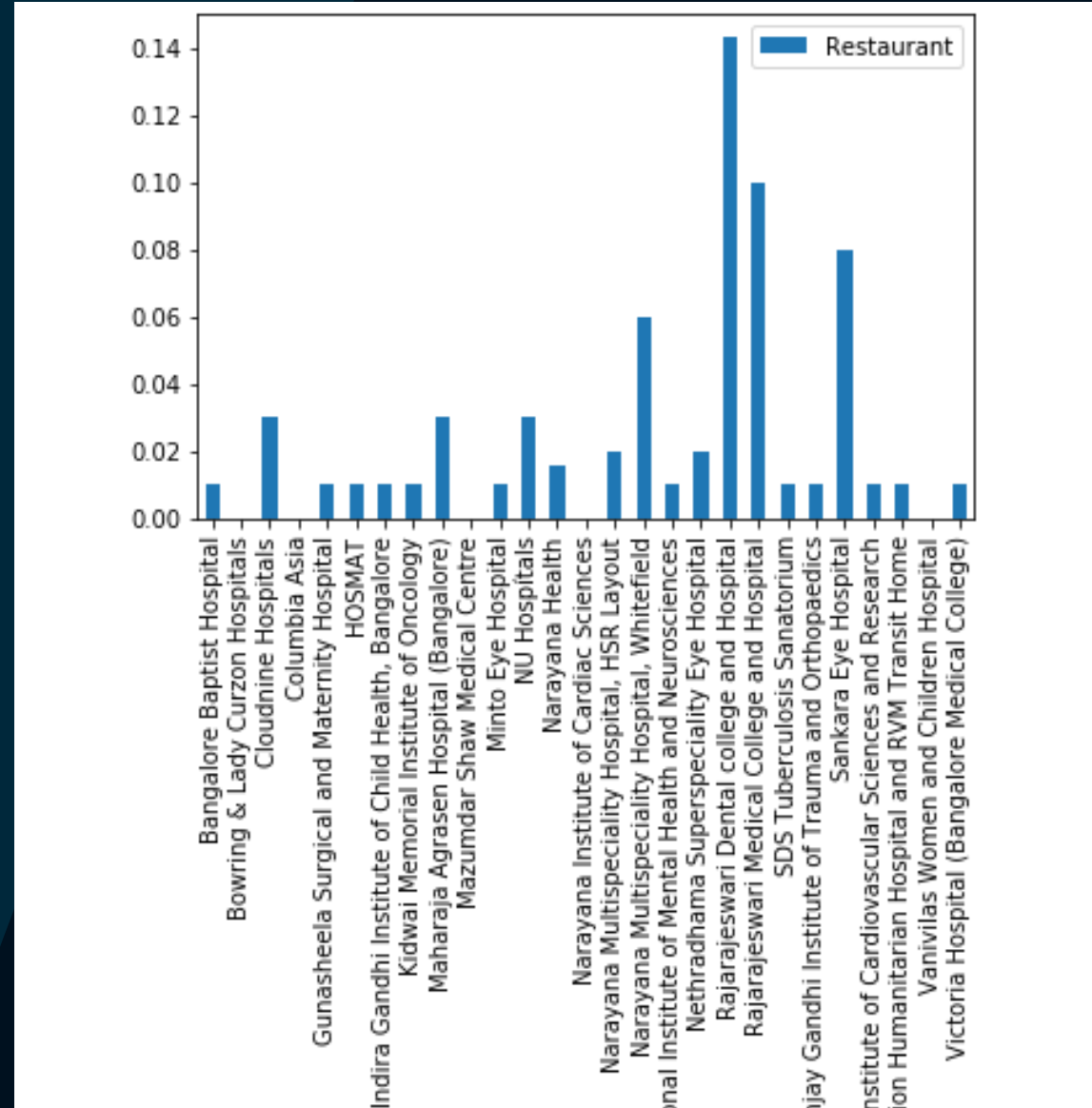
Using Foursquare API to get the venues and their categories around the required Hospital co-ordinates, we use the `groupby()` and `unique()` function to plot the various types of venues versus their count on a bar plot



Exploratory Data Analysis

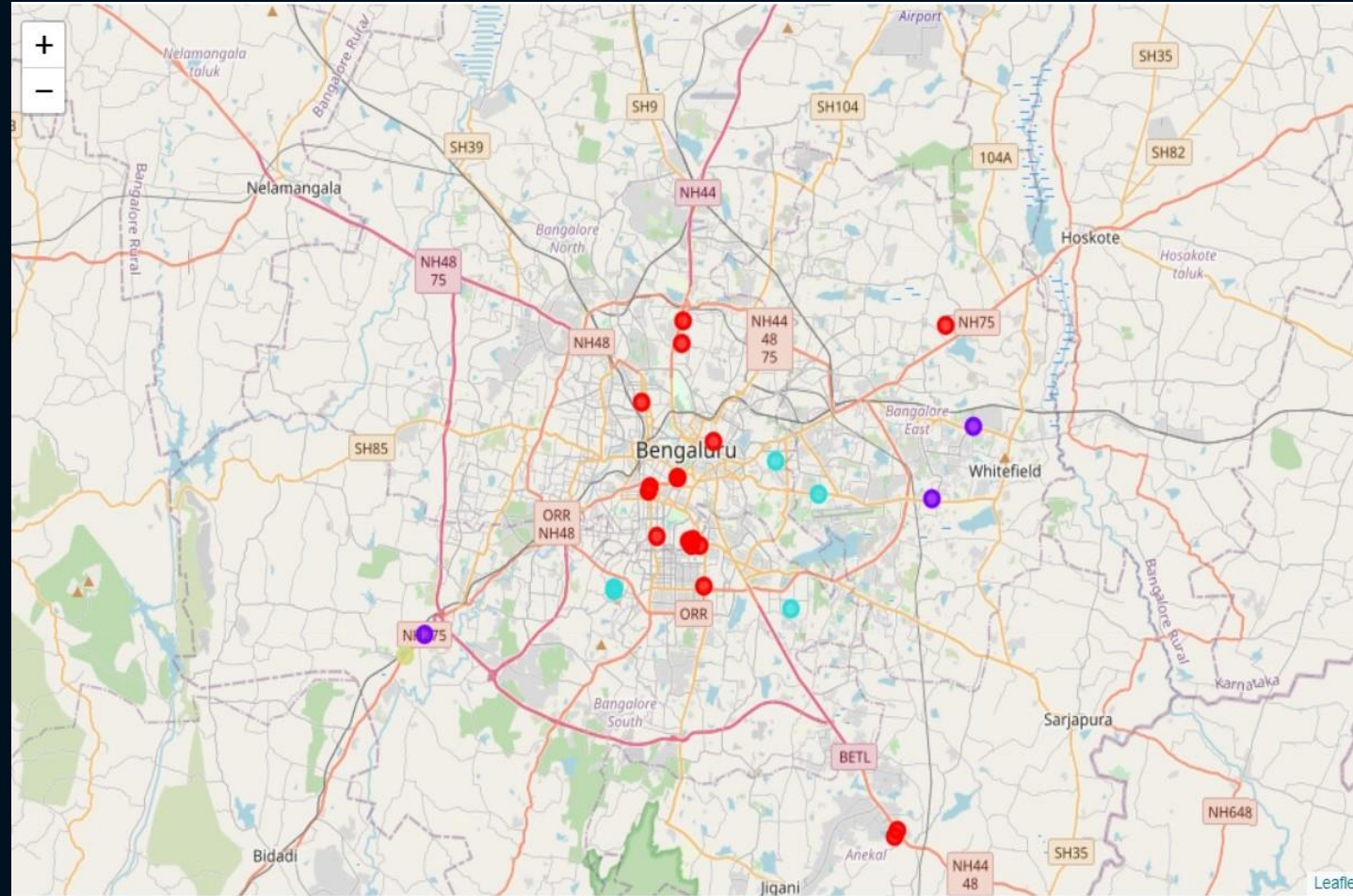
C. Mean of Restaurants around the Hospitals

We group the hospitals as per the mean of the number of restaurants around them. Then we plot the Hospital vs the mean of Restaurants



Results

- We can categorize the Hospitals into 4 clusters based on the frequency of occurrence for “Restaurant”:
1. Cluster 0: Hospitals with a very low number to no existence of Restaurants
 2. Cluster 1: Hospitals with moderate number of Restaurants
 3. Cluster 2: Hospitals with low number of Restaurants
 4. Cluster 3: Hospitals with high concentration of Restaurants



Discussion

- Most of the Hospitals are concentrated in the central area of Bangalore city
- The highest number of Restaurants are in cluster 3 and moderate number in cluster 1
- Cluster 0 has very low number to no Restaurants near the Hospitals
- Restaurants in cluster 3 are likely suffering from intense competition due to oversupply and high concentration of the same

Recommendations

- Cluster 0 represents a great opportunity to open new Restaurants as there is very little to no competition from existing places
- Cluster 2 can also be seen as prospective good places where new restaurants can be opened.
- Property developers with unique selling propositions can also open new Restaurants near Hospitals in cluster 1 with moderate competition
- Property developers are advised to avoid Restaurants in cluster 3 which already have high concentration of Restaurants and suffering from intense competition.

Conclusion

- The business question defined can be answered as: The neighbourhoods of Hospitals in Cluster 0 and 2 are the most preferred locations to open a new restaurant
- Clusters 1 and 4 give ample dining options for Hospital staff, bystanders and friends of patients who are visiting
- Findings of this project will help relevant stakeholders to capitalize on the opportunities on high potential locations while avoiding overcrowded areas to open new Restaurants to cater to Hospital food requirements.

References

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**THANK
YOU!**
