**Exploring venues in Bangalore, India**

**using Foursquare and Zomato API**

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**1. Introduction**

**1.1 Background**

Whenever a person searches for a venue in a new city, they’re highly interested in the best

places that the city has to offer. The person might want to know how good a given restaurant

is or the price range it falls under. This extra information would help decide which venue to

choose amongst the many venues in the city. Combining the location of the venues in the city

with their price and rating information would surely help visitors in a city make better informed

decisions about the places they should visit.

Bangalore is composed of a number of sectors spread across a total area of 114 sq Km. There

are many venues (especially restaurants, hotels and cafes) which can be explored. This project

explores various venues in Bangalore and attributes the data based on user ratings and average

price. To explore this information, this project involves the juxtaposition of both the

Foursquare API and the Zomato API to fetch complete information of various venues

(including name, address, category, rating, and price). Further, a map of the venues with

specific color attributes will be plotted to highlight their position, and information about these

venues. Such plots imbibe bountiful information in the form of their colored representations

and location on the map. This enables any visitor to take a quick glance and decide what place

to visit.

**1.2 Interested audience**

The target audience for such a project is twofold. Firstly, any person who is visiting

Bangalore, India can use the plots and maps from this project to quickly select places that suit

their budget and rating preferences. Secondly, a company can use this information to create a

website or a mobile application, which is updated on a regular basis, to allow individuals to the

city or even expand same functionality to other places.

**2. Data**

**2.1 Data Sources**

To get location and other information about various venues in Bangalore, I used two APIs

and decided to combine the data from both of them together.

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Using the Foursquare’s explore API (which gives venues recommendations), I fetched venues

up to a range of 1 kilometers from the center of Bangalore and collected their names,

categories and locations (latitude and longitude).

Using the name, latitude and longitude values, I used the Zomato search API to fetch venues

from its database. This API allows to find venues based on search criteria (usually the name),

latitude and longitude values and more. Given that the data from the two APIs did not align

completely, I had to use data cleaning to combine the two datasets properly.

From Foursquare API (https://developers.zomato.com/api), I retrieved the following for each

venue:

• **Name:** The name of the venue.

• **Category:** The category type as defined by the API.

• **Latitude:** The latitude value of the venue.

• **Longitude:** The longitude value of the venue.

From Zomato API (https://developers.zomato.com/api), I retrieved the following for each

venue:

• **Name:** The name of the venue.

• **Address:** The complete address of the venue.

• **Rating:** The ratings as provided by many users.

• **Price range:** The price range the venue belongs to as defined by Zomato.

• **Price for two:** The average cost for two people dining at the place. I later convert the

same to average price per person by dividing by 2.

• **Latitude:** The latitude value of the venue.

• **Longitude:** The longitude value of the venue.

**2.2 Data Cleaning**

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*Figure 1: Venues retrieved from Foursquare API*

*![A picture containing text, map

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*Figure 2: Venues retrieved from Zomato API*

From figure 1 and figure 2, we can clearly see that some venues from the two APIs do not align

with each other. Thus, I decided to combine them using their latitude and longitude values.

To combine the two datasets, I had to check that the latitude and longitude values of each

corresponding venue match. After careful analysis, I decided to drop all corresponding venues

from the two datasets that had their latitude and longitude values different by more than 0.0004

from one another. Thus, I rounded both the latitude and longitude values up to 4 decimal places.

Then, I calculated the difference between the corresponding latitude and longitude values and

saw if the difference was less than 0.0004 which should ideally mean that the two locations are

the same. This removed many outliers from the two datasets.

As a final dataset, we’re left with **140 venues with 8 columns** as described in figure 3.

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*Figure 3: Final data aggregated from both APIs*

**3. Methodology and Exploratory Data Analysis**

As a first step, I retrieve the venues in Banglore from Foursquare and Zomato APIs. I extract

the location data from the Foursquare API for all venues up to a distance of 4 kilometers from

the center of Banglore. Using this, I fetch the venue information including price and rating

data from Zomato API.

Using data cleaning, the dataset from the two APIs will be combined based on the venue names,

latitude, and longitude values. One to one matching and careful data inspection would be used

to remove any remaining outliers such as multiple venues at the same location from the two

datasets. The final data will include the venue name, category, address, latitude, longitude,

rating, price range, and average cost per person.

Using this dataset, I begin by analyzing the top venue types that exist in Banglore. I will then

explore the venues on maps. This will allow us to better understand the location of various

venues and the places where many venues co-exist and create place worth visiting. I’ll also

explore the venues based on the ratings and price range of various venues. The venues will be

plot using proper color coding such that a simple glance at the map would reveal the location

of the venues as well as give information about them. I aim to identify places which can be

recommended to visitors based on their price and rating preferences. I’ll also cluster the venues

and see if we can draw meaningful information out of what kind of venues exist in Banglore.

As a final step, I will analyse these plots and try to draw conclusions on what places can be

recommended to visitors. I’ll discuss my findings and any inferences I can draw.

**3.1 Categories**

I begin my analysis by taking a look at the various categories of venues that exist in

Banglore. As there are many restaurants, I believe that the majority venues shall include

restaurants.![A screenshot of a cell phone

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*Figure 4: Count of various types of venues in Banglore*

From figure 4, we see that the majority venues are Indian Restaurants. This is closely followed by Ice cream shops. For someone who is visiting Bangalore and loves either ice cream or Indian

Restaurants, they’d surely love their stay.

**3.2 Rating**

Next, I’ll explore the ratings of various venues in Bangalore. I decided to plot a bar chart with

x-axis as the rating from 1 to 5 and the y-axis as the count of venues with that rating. I decided

to plot the bar chart to see what average rating venues get in Bangalore. This can be seen in

figure 5.

While the whole range of rating of venues might stretch from 1 to 5, the average rating is spread

across 4 with maximum number of venues scoring between 3 and 5.

The venues that were rated below 3 were marked by red and orange while the venues that were rated more than or equal to 3 were plot as green and dark green. Taking a look at figure 6 reveals the same results as the bar plot.

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*Figure 5: Rating and count of venues with that rating*

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*Figure 6: Plot of venues with different ratings*

**3.3 Price**

Next, I explore the average prices of all venues for one person using a scatter plot along with

the count of venues with that average price per person. Taking a look at figure 7, reveals that

the majority venues have an average cost of Rs 200 to Rs 400 for one person. Even though the

maximum venues lie in that range, the actual range of prices is very different. There are places

with average price even as high as Rs 1000+ for one person.

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*Figure 7: Price per person with count of venues with that price*

**3.4 Clustering**

Finally, I cluster all the venues based on their price range, location and more to identify similar

venues and the relationship amongst them. I used KMeans clustering.

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*Figure 9: Clusters of venues*

**4. Results and Discussion**

After collecting data from the Foursquare and Zomato APIs, we got a list of over 240 different

venues. However, not all venues from the two APIs were identical. Hence, we had to inspect

their latitude and longitude values as well as their names to combine them and remove all the

outliers. This resulted in a total venue count of 140.

We identified that from the total set of venues, majority of them were ice cream shops and Indian

Restaurants. A visitor who loves ice cream shop/Indian Restaurants would surely benefit from coming to Banglore.

While the ratings range from 1 to 5, majority venues have ratings close to 4. This means that

most restaurants provide good quality food which is liked by the people of the city, thus

indicating the high rating.

When we take a look at the price values of each venue, we explore that many venues have

prices which are in the range of Rs 200 to Rs 400 for one person. However, the variation in

prices is very large, given the complete range starts from Rs 100 and goes uptil Rs 1200.

Finally, through clusters we identified that there are many venues which are relatively lower

priced but have an average rating of 3.57. On the other hand, there are few venues which are

high priced and have average rating of 4.03.

1. If you’re looking for cheap places with relatively high rating, you should check majestic,

Residency road

2. If you’re looking for the best places, with the highest rating but might also carry a high

price tag, you should visit Vittal malya road and MG road.

A company can use this information to build an online website/mobile application, to provide

users with up to date information about various venues in the city based on the search criteria

(name, rating and price).

**5. Conclusion**

The purpose of this project was to explore the places that a person visiting Bangalore could

explore. The venues have been identified using Foursquare and Zomato API and have been

plotted on the map. The map reveals that there are three major areas a person can visit: Majestic

, MG road & Vittal Malya road. Based on the visitor’s venue rating and price preferences,