Exploring Different Spots and Venues in Jaipur, Rajasthan, India

by

Vaishnavi Ajmera

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 hotel or 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. Consolidating the area of the different venues in the city with their cost and rating data would doubtlessly help visitors in a city settle on better-informed choices about the spots they should visit.

Jaipur is composed of a number of sectors spread across a total area of 486 sq Km. There are many venues (especially restaurants, hotels and cafes) which can be explored. This project explores various venues in Jaipur and attributes the data based on user ratings and average price. To explore this information, this project involves data from 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 different color attributes will be plotted to highlight their position, and information about these venues. Such plots assimilate plentiful data as their shaded portrayals and area on the guide. This empowers any visitor to take a quick look and choose what spot to visit.

1.2 Audience that can be interested

The target audience for such a project is of three types.

1. Any person who is visiting Jaipur, can use the plots and maps from this project to quickly select places that suit their budget and rating preferences.

2. 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.
3. And this information can be useful for any entrepreneur to open a new hotel, restaurant, café, etc, by identifying the potential areas of growth of their business using these plots.

2. Data

2.1 Data Sources

To get location and other information about various venues and spots in Jaipur, I used two APIs and decided to combine the data from both of them together.

Using the Foursquare's explore API (which gives venues recommendations), I fetched venues up to a range of 6 kilometers from the center of Jaipur and collected their names, categories and locations (latitude and longitude).

Using the name, latitude and longitude values obtained from the FourSquare API, 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://foursquare.com/developers/api), I retrieved the following information 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 information 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 it to the average price per person by dividing it by 2.

• Latitude: The latitude value of the venue.

• Longitude: The longitude value of the venue.

2.2 Data Cleaning

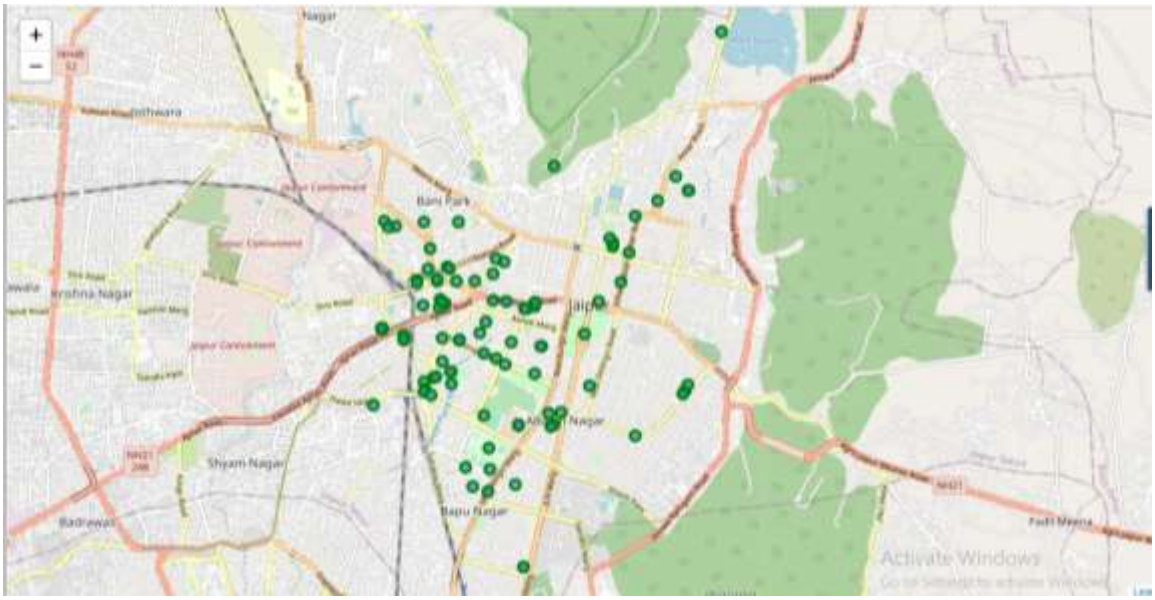

Figure 1: Venues retrieved from FourSquare API

Figure 2: Venues retrieved from Zomato API

The data from numerous assets may not generally be aligned. In this manner, it is important to consolidate the information recovered from different assets appropriately.

We can see that there are many venues identified by both Foursquare and Zomato. There is a lot of overlapping between the two. However, there are others where the data does not match. Thus, I decided to combine them using their latitude and longitude values.

To combine the two datasets, I'll have to check that the latitude and longitude values of each corresponding venue match. Thus, I'll round both the latitude and longitude values upto 2 decimal places. Then, I'll calculate the difference between the corresponding latitude and longitude values and see if the difference is less than 0.01 which should ideally mean that the two locations are same. I have selected the venue name from Zomato API. I also get the average price per person by dividing the column price_for_two by 2 and removing this column from the dataset along with other unnecessary columns. I have dropped the venues which have 0.0 rating as it means it's not been rated yet.

As a final dataset, we're left with 77 venues with 8 columns as described in figure 3.

	categories	venue	latitude	longitude	price_range	rating	address	average_price
0	Tea Room	Nothing Before Coffee	26.91	75.81	1.0	4.2	Opposite Mahaveer College Gate 2, Mahaveer Mar...	200.0
1	Indie Movie Theater	The Doors	26.92	75.81	1.0	3.8	Khandaka Mansion, Near Raj Mandir Cinema, MI R...	200.0
2	Hotel	The Rajput Room - Rambagh Palace	26.90	75.81	4.0	4.2	Rambagh Palace, Bhawani Singh Road, C Scheme, ...	2000.0
3	Hostel	The Moustache Headquarters	26.92	75.80	2.0	3.9	7, Park House, Near Ganpati Plaza, MI Road, Ja...	450.0
4	Hotel	Chitra Cafeteria	26.92	75.80	2.0	4.0	Arya Niwas Hotel, Behind Amber Towers, Sansar ...	275.0

Figure 3: Final Data

3. Methodology

This project aims at identifying the venues and spots in Jaipur based on their rating and average costs. This would enable any visitor to identify the venues he/she wants to visit based on their rating and cost preference.

As a first step, I retrieved the data from two APIs (Foursquare and Zomato). We extract venue information from the center of Jaipur, upto a distance of 6 Km. The latitude and longitude values are then used to fetch venue rating and price from Zomato.

Secondly, I then explored the data retrieved from the two APIs on the map and identified the top category types. The data from the two sources is carefully combined based on the name,

latitude and longitude values from the two sources. The final dataset would include the rating and price values for each venue.

Next, I have analysed the data that I created based on the ratings and price of each venue. I identify places where many venues are located so that any visitor can go to one place and enjoy the option to choose amongst many venue options. I have also explore areas that are high rated and those that are low rated while also plotting the map of high and low priced venues. Lastly, I have clustered the venues into different clusters based on the available information of each venue. This will also allow us to clearly identify which venues can be recommended. Finally, I have discussed results and conclude which venues to be explored based on visitor requirement of rating and cost.

4. Analysis

I have analyzed the venues and spots based on their rating. The rating of a venue is based on user reviews and belongs to a range from 1 to 5. I have also analyzed the venues based on their price per person as well as the price range.

4.1 Categories

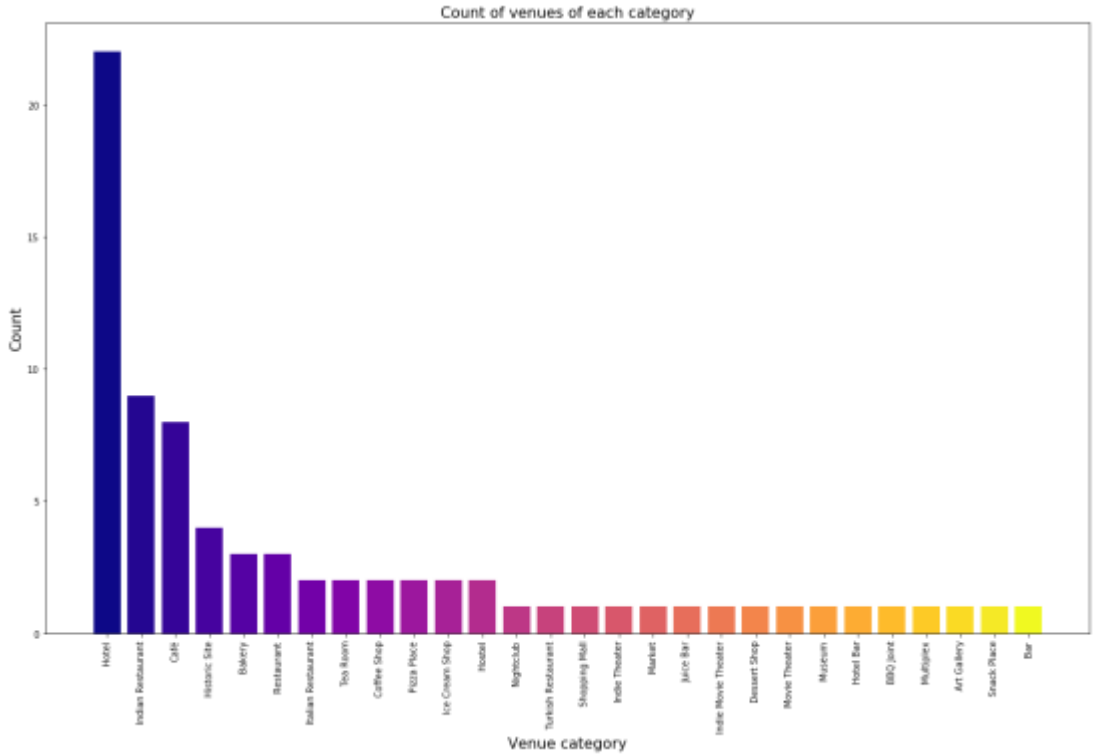

Figure 4: Count of various types of Venues in Jaipur

I begin my analysis by taking a look at the various categories of venues that exist in Jaipur. As there are many restaurants, I believe that the majority venues shall include restaurants.

As we can see the majority venues are Hotel, Cafe and Indian Restaurant. So, we can see that this is a great tourist place as it has large number of hotels and if anyone loves Cafes and Indian Restaurant Jaipur is great place to visit.

4.2 Rating

Next, I have explored the ratings of various venues in Jaipur as they can be a very impotant factor on which a visitor decides whether it is worth it to visit the place or not. 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 Jaipur. This can be seen in figure 5.

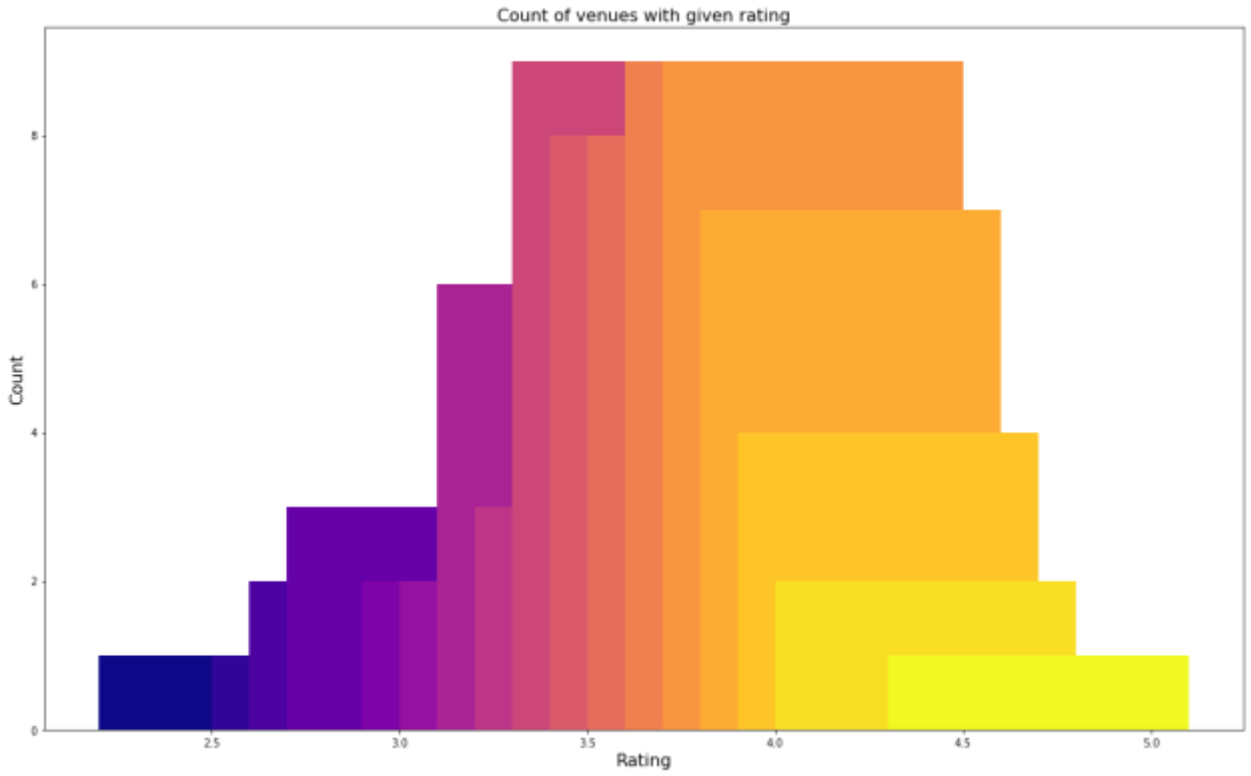

Figure 5: Rating and count of venues with that rating

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.

I followed this information by plotting the venues on the map of Jaipur. The venues that were rated below 3 were marked by red and yellow while the venues that were rated more than or equal to 3 were plot as green and blue. Taking a look at figure 6 reveals the same results as the bar plot. It appears that many venues are located near about MI Road, Adarsh Nagar, Bani Park with rating above 3. If someone wants to explore new venues, they should definitely check out these locations.

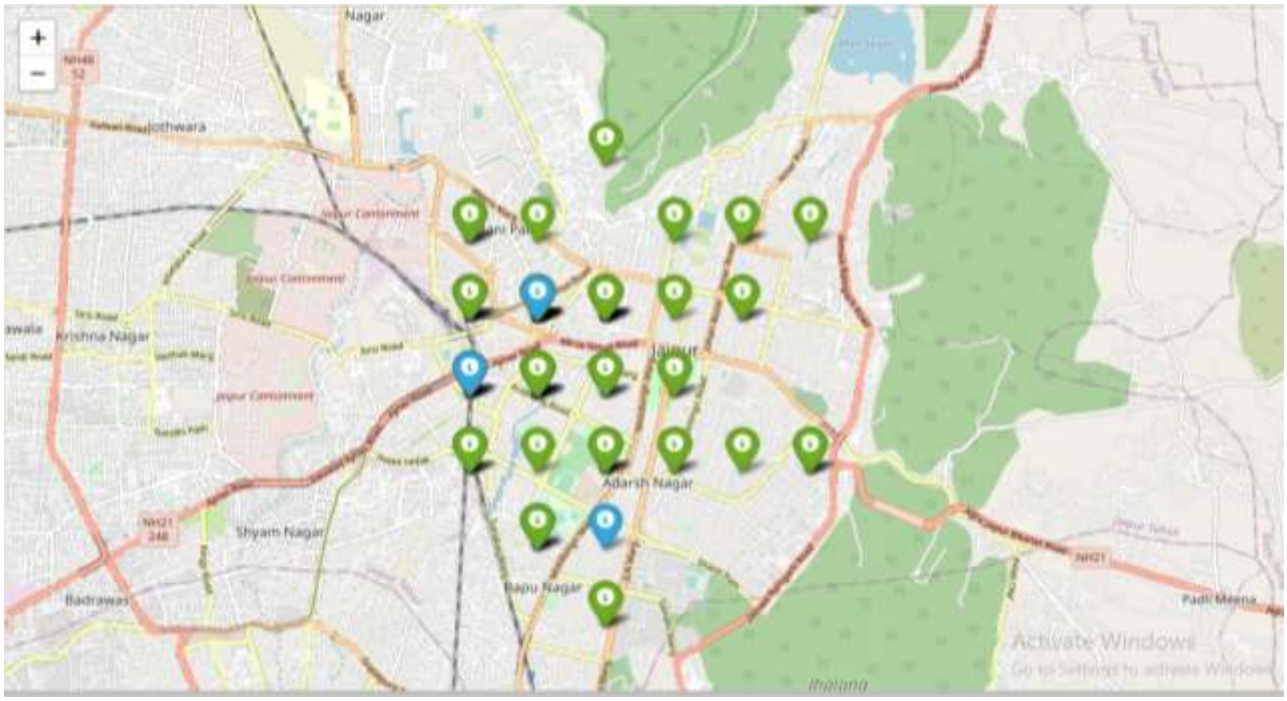

Figure 6: Plot of venues with different ratings

4.3 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 500 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 2000+ for one person.

I also plot the venues based on their price range. Figure 8 includes all the venues where high priced venues are marked by yellow and red while the low priced venues are marked with green and blue. From the plot, we observe that the venues in Jaleb Chowk, MI Road, near

Amer Road has high prices, while the spots in Khasa Kothi, Civil Lines and Bais Godam are of average price. As the places having high prices are near historical monuments so we can easily know the reason of their high average price.

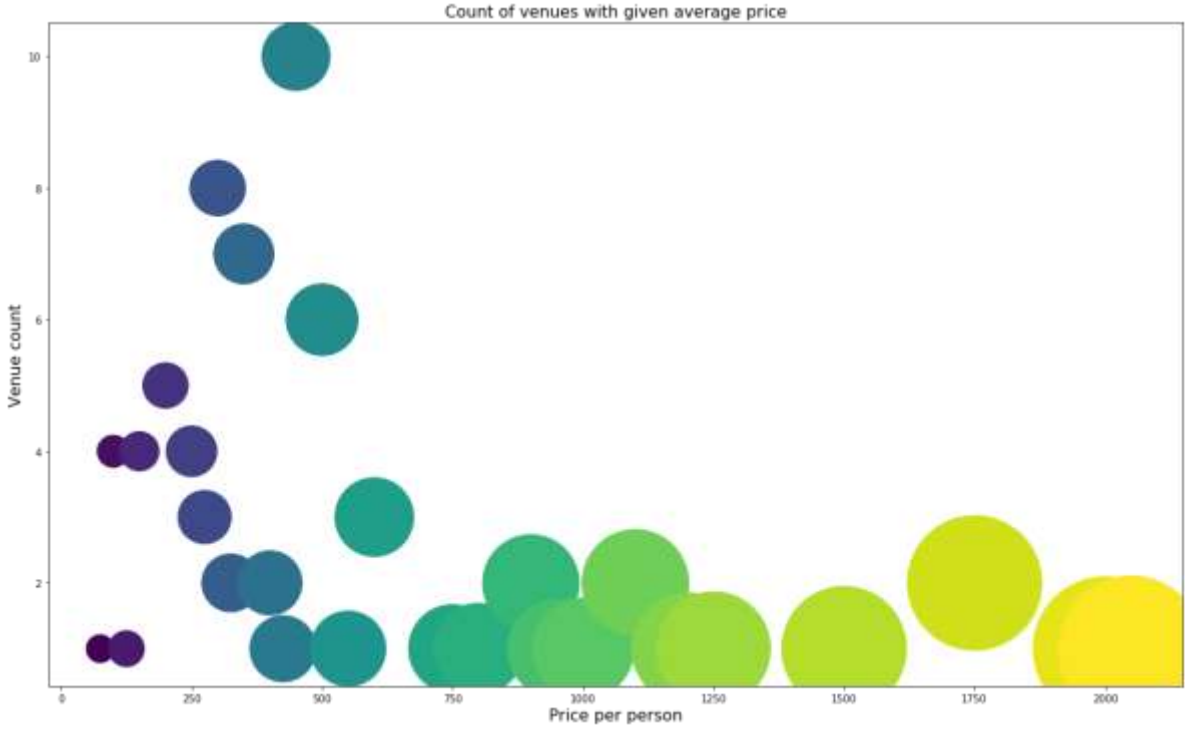

Figure 7: Average price per person with count of venues with that price

Figure 8: Plot of venues with different prices

4.4 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 K-Means clustering and decided to cluster the venues into 4 separate groups.

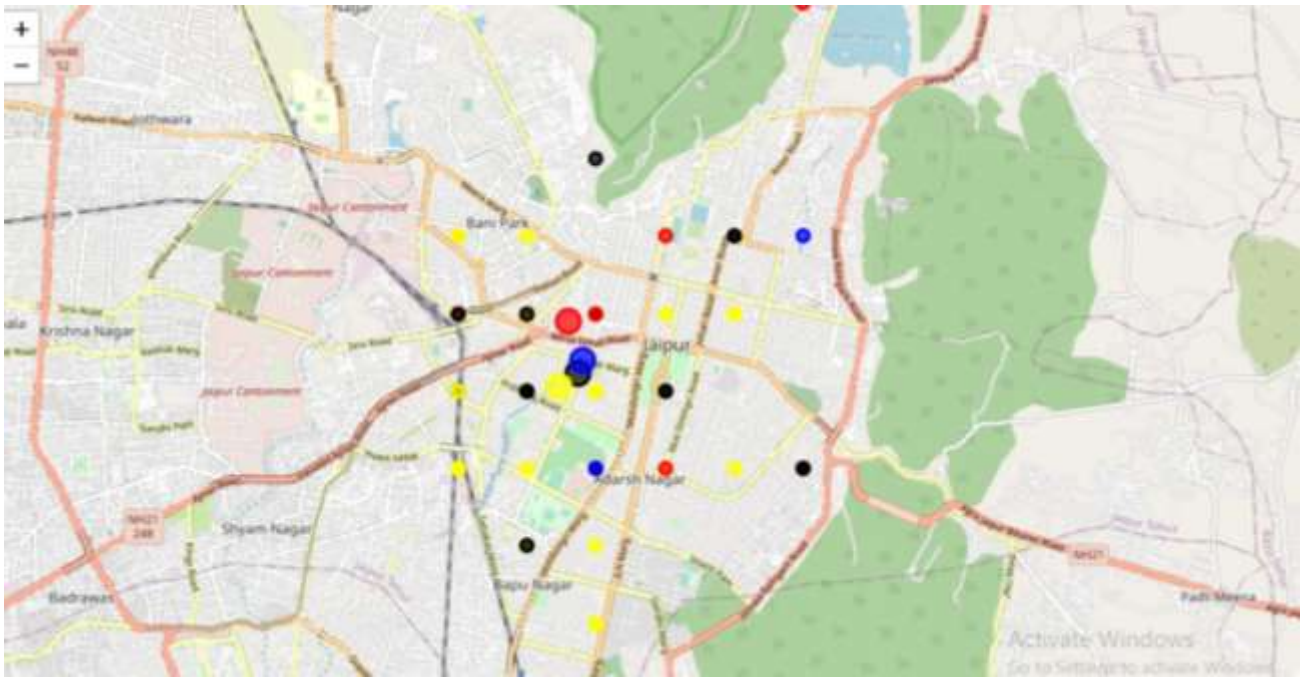

Figure 9: Clusters of Venues

From the map we can see the 4 clusters, with large no. of third type of cluster with yellow color with large no. of venues and spread across the whole city.

- These venues for cluster 0 have mean price range of 2.33 and rating spread around 3.73 having black color.
- These venues for cluster 1 have mean price range of 3.50 and rating spread around 3.94 having red color.
- These venues for cluster 2 have mean price range of 1.53 and rating spread around 3.82 having yellow color.
- These venues for cluster 3 have mean price range of 4.00 and rating spread around 4.08 having blue color.

5. Results & Discussions

Based on our analysis above, we can draw a number of conclusions that will be useful who is visiting the city Jaipur and planning to start something.

After collecting data from the Foursquare and Zomato APIs, I got a list of 100 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 names to combine them and remove all the outliers.

We identified that from the total set of venues, majority of them were Hotels, Cafes and Indian Restaurants.

While the complete range of ratings range from 1 to 5, the majority venues have ratings between 3.5 to 4.5. 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 plot these venues on the map, we discover that there are clusters of venues around MI Road, Adarsh Nagar, Bani Park. These clusters also have very high ratings (more than 3).

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 2000. On plotting the venues based on their price range on the map, we discovered that the spots in Jaleb Chowk, MI Road, near Amer Road has high prices, while the spots in Khasa Kothi, Civil Lines and Bais Godam are of average price. As the places having high prices are near historical monuments so we can easily know the reason of their high average price.

Finally, through clusters we identified that there are many venues in 3 different clusters which are relatively lower priced with an average rating of 3.82-3.95. On the other hand, there are few venues in a particular cluster i.e. last cluster(Cluster 3) which are high priced and have average rating of 4.08.

A company can use this information to build up 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). An an entrepreneur can also use this information to open a new cafe, hotel, restaurant and other venues in Jaipur.

6. Conclusion and Future Scope

The purpose of this project was to explore the places that a person visiting Jaipur could visit. The venues have been identified using Foursquare and Zomato API and have been plotted on the map. Based on the visitor's venue rating and price requirements, he/she can choose amongst the three places.

And we can also improve this project in future by taking in concern other factors also population, etc. And we can extend it to whole city Jaipur and to other cities also.