Capstone Project-The Battle Of Neighborhoods

To set up a new Indian Restaurant in Paris

Introduction

❖ **Background:** Paris is the capital and the most populous city of France and has a population of more than 2.1 million people. Since the 17th century, Paris has been one of Europe's major centres of finance, diplomacy, commerce, fashion, science and arts. With its diverse culture, comes diverse food items. There are many restaurants in Paris, each belonging to different categories like Chinese, Indian , French etc.

❖ **Business Problem:**The main objective is to set up a new Indian restaurant in the best location in Paris.In order to achieve high success rate we must consider following factors:Marketplaces,Competition in particular location,Aiding places that make people come to restaurants like Gym, Entertaining Public places,Population,and Menu from competitors.

❖ **Target Audience:** Business personnel or entrepreneur or freelancer who would like to open a new Indian restaurant in best location in Paris.

Data Acquisition

The data is acquired from the following sources:

➢ The first data source acquired consists of 20 arrondissements present in paris along with geolocation data of each arrondissement.It is acquired from:

https://opendata.paris.fr/explore/dataset/arrondissements/table/?dataChart

➢ The second data source is about farmers market present in each arrondissement in paris.It is acquired from:

https://opendata.paris.fr/explore/dataset/marches-decouverts/download/?format=json&timezone=Europe/Berlin

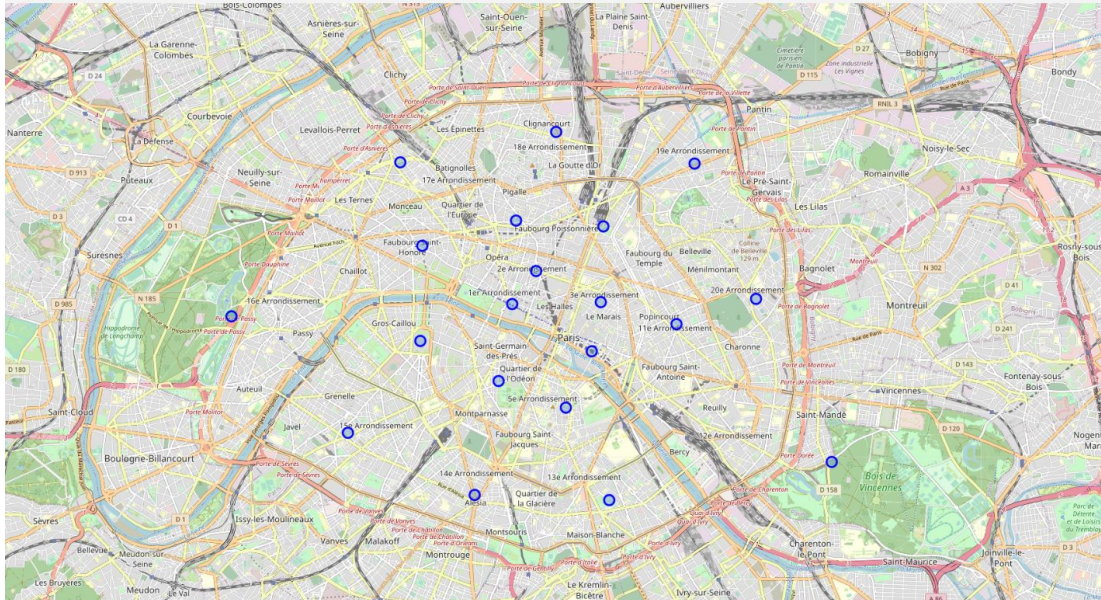➢ The third data source acquired consists of current population data present in each arrondissement in paris.

Data Cleaning

The data cleaning is performed on the three data sources individually.

- We outline the 20 arrondissement names along with geolocation data,present population in each arrondissement and farmer's market data from the sources according to our requirements.
- Using Foursquare API,we obtain geolocation data of each arrondissement in paris.Data analysis and data visualization are done using matplotlib,seaborn packages and folium maps on arrondissements of paris and farmer's market.
- Using Foursquare information,we acquired nearby 100 venues of each arrondissement and obtained 10 most common venues of each neighborhood from it to form a new dataset.

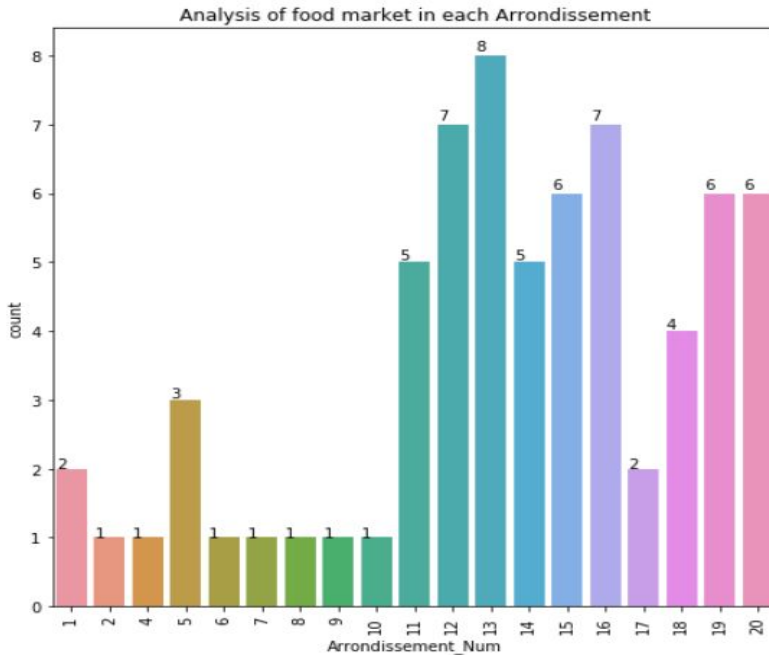# Exploratory Data Analysis

Arrondissements in Paris

There are 20 arrondissements in Paris which are represented in blue circles.

Venue Categories in each Arrondissement in Paris

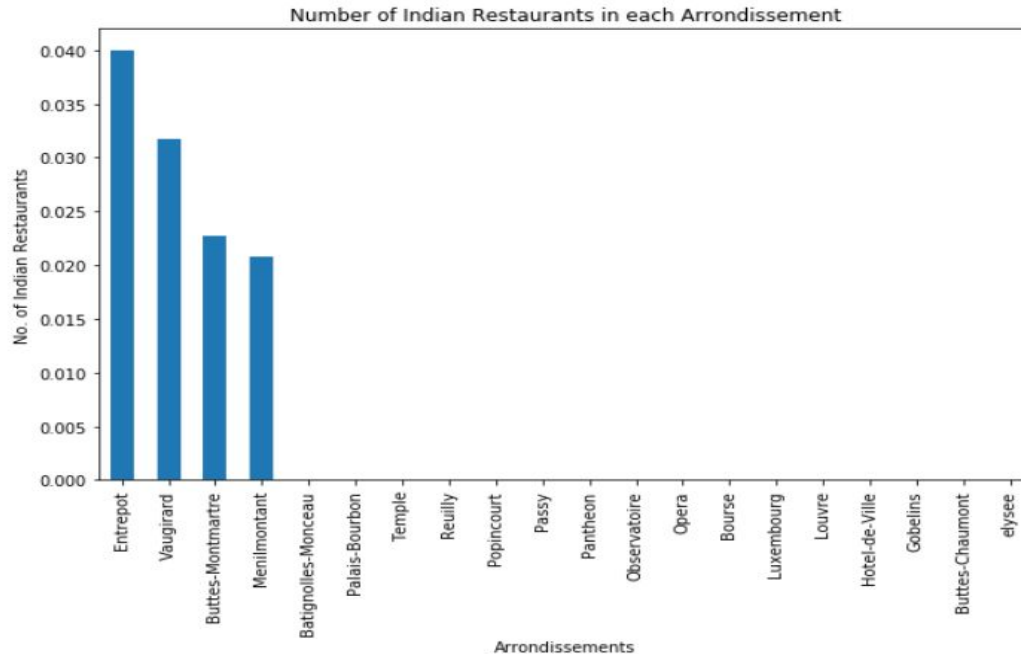|	Neighborhood	Latitude	Longitude	Venue	Venue_Latitude	Venue_Longitude	Venue_Category
0	Temple	48.862872	2.360001	Mmmozza	48.863910	2.360591	Sandwich Place
1	Temple	48.862872	2.360001	Chez Alain Miam Miam	48.862369	2.361950	Sandwich Place
2	Temple	48.862872	2.360001	Square du Temple	48.864475	2.360816	Park
3	Temple	48.862872	2.360001	Marché des Enfants Rouges	48.862806	2.361996	Farmers Market
4	Temple	48.862872	2.360001	Chez Alain Miam Miam	48.862781	2.362064	Sandwich Place
5	Temple	48.862872	2.360001	Okomusu	48.861453	2.360879	Okonomiyaki Restaurant
6	Temple	48.862872	2.360001	Le Burger Fermier des Enfants Rouges	48.862831	2.362073	Burger Joint
7	Temple	48.862872	2.360001	Hôtel Jules & Jim	48.863496	2.357395	Hotel
8	Temple	48.862872	2.360001	SoMa	48.861511	2.362146	Japanese Restaurant
9	Temple	48.862872	2.360001	Les Enfants Rouges	48.863013	2.361260	Wine Bar
10	Temple	48.862872	2.360001	Bontemps	48.863956	2.360725	Dessert Shop
11	Temple	48.862872	2.360001	Biglove Caffè	48.862063	2.363557	Italian Restaurant
12	Temple	48.862872	2.360001	Little Red Door	48.863703	2.363514	Speakeasy
13	Temple	48.862872	2.360001	Hank Burger	48.861340	2.358304	Burger Joint
14	Temple	48.862872	2.360001	Lily of the Valley	48.865221	2.361990	Tea Room
15	Temple	48.862872	2.360001	L'Îlot	48.864666	2.363317	Seafood Restaurant
16	Temple	48.862872	2.360001	Breizh Café	48.860613	2.361804	Creperie
17	Temple	48.862872	2.360001	Candelaria	48.863032	2.364059	Cocktail Bar
18	Temple	48.862872	2.360001	Taing Song-Heng	48.864701	2.356888	Vietnamese Restaurant
19	Temple	48.862872	2.360001	0fr.	48.865746	2.361236	Bookstore
20	Temple	48.862872	2.360001	Le Roi de Pique	48.863375	2.358299	Café
21	Temple	48.862872	2.360001	Hank Pizza	48.863737	2.357199	Pizza Place
22	Temple	48.862872	2.360001	Le Barav	48.865166	2.363155	Wine Bar
23	Temple	48.862872	2.360001	Gigi	48.864753	2.363088	Creperie
24	Temple	48.862872	2.360001	Laizé 来座 (Laizé)	48.863077	2.355073	Bubble Tea Shop
25	Temple	48.862872	2.360001	Fringe	48.862612	2.364752	Coffee Shop

Here it shows a dataframe of arrondissement names and its venues along with venue categories.

Analysis of Farmer's Market in each Arrondissement

Analysis of food market in each Arrondissement

Here in the plot, we can see that arrondissements 12, 13 and 16 i.e Reuilly,Gobelins,and Passy have the most number of food markets then compared to other arrondissements. So for freshness and lower cost of ingredients, we can consider these arrondissements for setting up the restaurant.
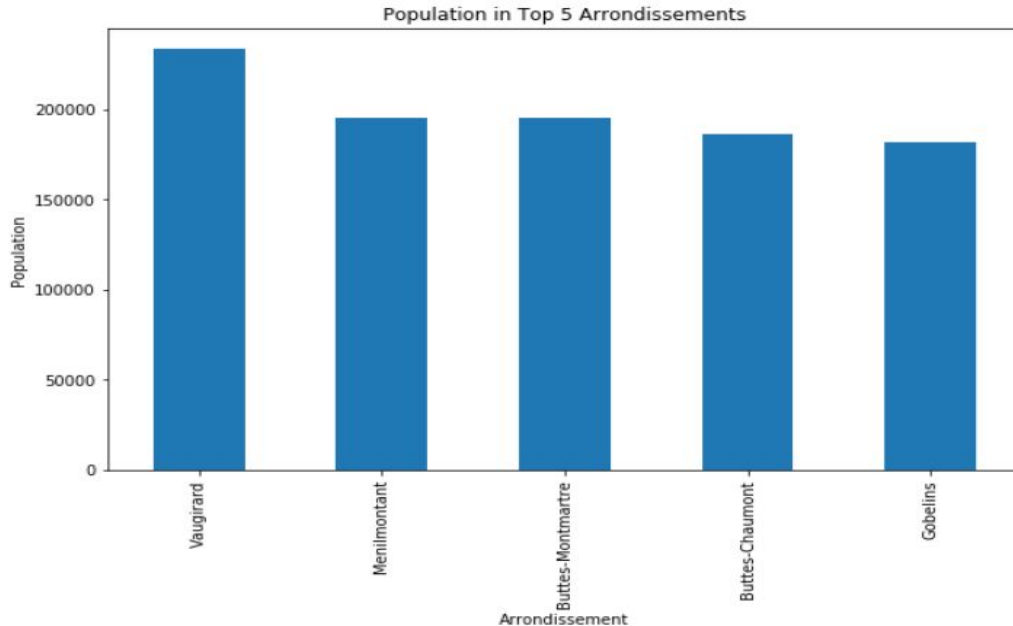
Number of Indian Restaurants present in each Arrondissement

By visualizing, we can see that only four arrondissements are having Indian restaurants i.e Entrepot, Buttes-Montmartre,Ménilmontant, and Vaugirard.Here Entrepot has most number of Indian Restaurants.
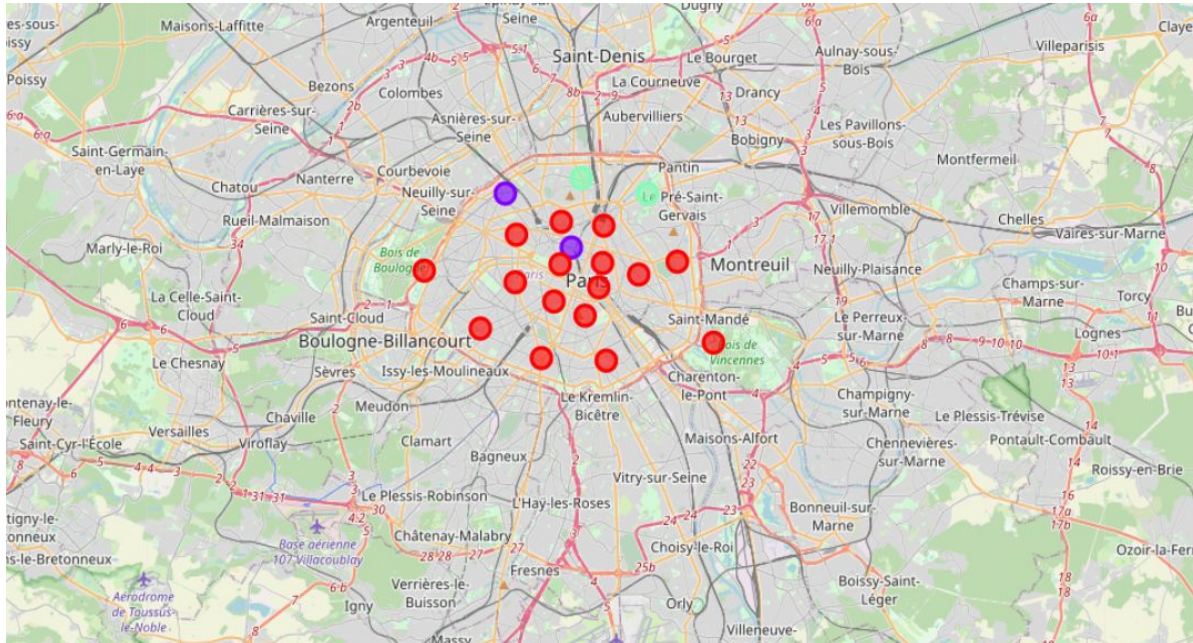
Top 5 Population Arrondissements in Paris

Population in Top 5 Arrondissements

From the above plot,we can observe that Vaugirard, Ménilmontant, Buttes-Montmartre, Buttes-Chaumont and Gobelins are top 5 highly populated arrondissements in Paris.

Clustering of Arrondissements in Paris using K-means algorithm

- Here Cluster0 represents red color,Cluster1 represents violet color and Cluster2 represents green color.
- Cluster0 consists of 16 arrondissements whereas Cluster1 and Cluster2 consist of two arrondissements each.

Results and Discussion

The Clustering of arrondissements using K-means clustering algorithm(a form of unsupervised learning)resulted in showing three clusters in which cluster0 shows most number of arrondissements with venues than other clusters.As considering the factors of population,farmer's market,and most entertaining venues we can recommend the arrondissements Reuilly, Gobelins,and Passy for setting up the restaurant.But Gobelins has various number of restaurants and less entertaining public places,so we can recommend Reuilly or Passy for setting up a new Indian Restaurant as both of them have more entertaining public places.

Conclusion

❏ The analysis enabled us in figuring out two main regions for setting up the restaurant which are mostly visited by the tourists and locals.

❏ Further based analysis can provide which specific cuisine should be served by the restaurant for maximizing profits and it's up to the entrepreneur or stakeholder's final decision for choosing a recommended place,considering some features like cost of budget for setting up the restaurant.