Analysis of Restaurants in Paris on the basis of its Type and Distance Using Foursquare API

A REPORT BY Raman Sharma

1) INTRODUCTION: - Paris, The Capital of France is considered as one of the best food cities in Europe. The French capital is bustling with great choices of new restaurants by talented young chefs from all over the world, plus an inventive and diverse array of casual dining options.

The idea of this project is to Analyse the various types of Restaurants present in Paris on the basis of its Type and Distance from the Centre by using the Foursquare API (Distance is in units since it is measured with the help of latitude and longitude coordinates.) which will be of great use to a client or a tourist to determine what are the types

of Restaurants in Paris that are worth visiting based on its type and proximity.

I have taken Distance as a Parameter since it plays an important role for a tourist to decide which type of restaurant is near to his/her residence which will save time.

2) DATA: - The data that we will be using is the Foursquare Location Data of Paris, France which is of Restaurant Type by using the geographical coordinates in the form of Latitude and Longitude.

3) METHODOLOGY: - 1) the first step is to import all the necessary Libraries like Pandas, Folium, Nominatim, Geocoders Seaborn etc.

2) Obtaining the Geographical Coordinates of Paris (Latitude and Longitude) by using Nominatim and Geocoders.

3) Setting up the Foursquare API by using the Client ID, Client Secret and other Credentials.

4) Specifying the Search Query that is, Restaurant.

5) Transforming the Information and filtering it as per the problem statement and converting it into a Pandas Dataframe.

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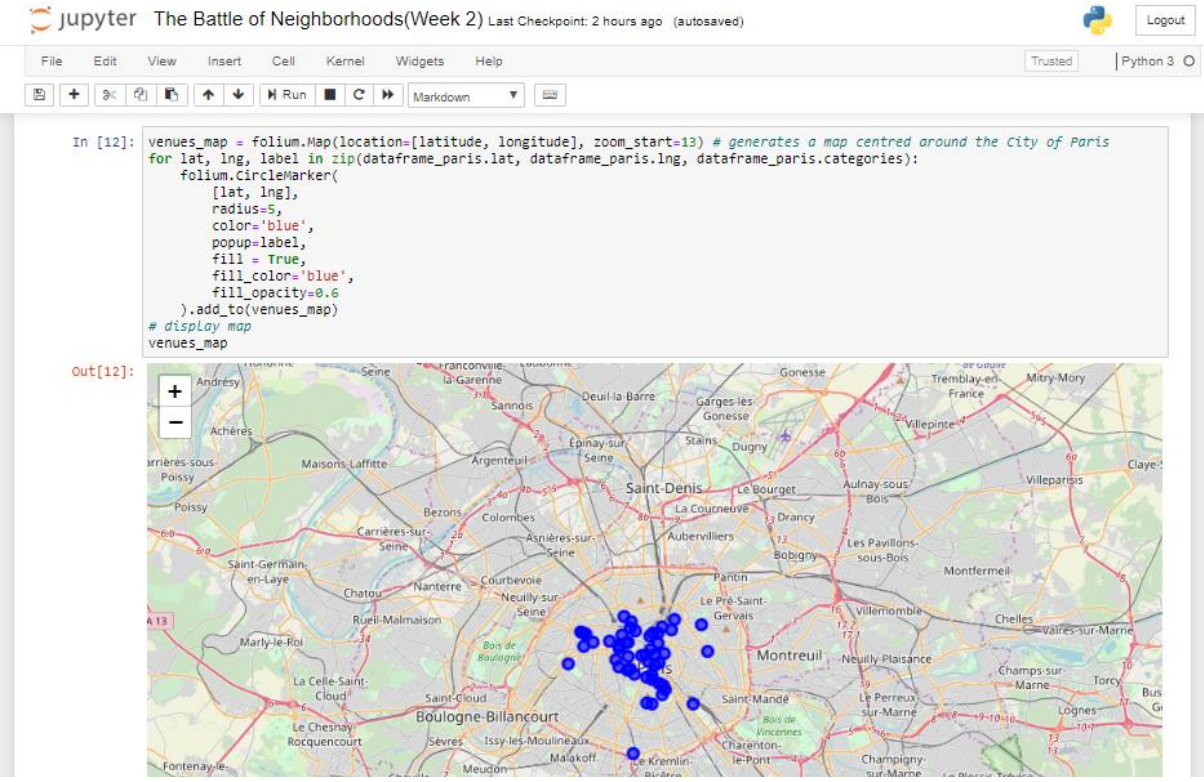
Out[7]:

	name	categories	address	lat	lng	labeledLatLngs	distance	postalCode	cc	city	state	country	formattedAddress	crossStre
0	Restaurant Aux Tours de Notre-Dame	French Restaurant	23 rue d'Arcole	48.853622	2.349421	[{'label': 'display', 'lat': 48.85362193008465...	373	75004	FR	Paris	Île-de-France	France	[23 rue d'Arcole, 75004 Paris, France]	Ni
1	Restaurant Le Mona Lisa	French Restaurant	47 rue Berger	48.862198	2.342542	[{'label': 'display', 'lat': 48.8621980915973 1...	895	75001	FR	Paris	Île-de-France	France	[47 rue Berger, 75001 Paris, France]	Ni
2	Le Restaurant du Musée d'Orsay	French Restaurant	1 rue de la Légion d'Honneur	48.860300	2.325392	[{'label': 'display', 'lat': 48.86029986249957...	1950	75007	FR	Paris	Île-de-France	France	[1 rue de la Légion d'Honneur, 75007 Paris, Fr...	Ni
3	Le Restaurant des Poètes	French Restaurant	12 passage Molière	48.862321	2.351590	[{'label': 'display', 'lat': 48.8623213101303 0...	626	75003	FR	Paris	Île-de-France	France	[12 passage Molière, 75003 Paris, France]	Ni
4	Restaurant Costes Saint-Honoré	French Restaurant	Hôtel Costes	48.866698	2.327894	[{'label': 'display', 'lat': 48.8666978945037 4...	2053	NaN	FR	Paris	Île-de-France	France	[Hôtel Costes (239 rue Saint-Honoré), Paris, F...	239 r Sai Hono
5	Restaurant de l'Institut du Monde Arabe.	Middle Eastern Restaurant	1 rue des Fossés Saint-Bernard	48.848818	2.356911	[{'label': 'display', 'lat': 48.8488179619543 3...	963	75005	FR	Paris	Île-de-France	France	[1 rue des Fossés Saint-Bernard (Institut du M...	Institut Mon Ara
6	Restaurant Hotel Little Palace	Restaurant	Hotel Little Palace	48.867386	2.353741	[{'label': 'display', 'lat': 48.867386, 'lng':...	1201	75003	FR	Paris	Île-de-France	France	[Hotel Little Palace (4 rue Salomon de Caus), ...	4 r Salomon Ca
7	Restaurant Le Meurice Alain Ducasse	French Restaurant	228 rue de Rivoli	48.865291	2.328056	[{'label': 'display', 'lat': 48.8652914510938 4...	1963	75001	FR	Paris	Île-de-France	France	[228 rue de Rivoli (Hôtel Le Meurice), 75001 P...	Hôtel Meuri
8	Le Restaurant de L'Hôtel	French Restaurant	13 rue des Beaux-Arts	48.856192	2.335133	[{'label': 'display', 'lat': 48.8561915744175 3...	1197	75006	FR	Paris	Île-de-France	France	[13 rue des Beaux-Arts (L'Hôtel), 75006 Paris,...	L'Hô
9	Restaurant administratif	Restaurant	Campus Jussieu - Bâtiment F	48.847206	2.358817	[{'label': 'display', 'lat': 48.8472055072400 2...	1186	75015	FR	Paris	Île-de-France	France	[Campus Jussieu - Bâtiment F (Place Jussieu), ...	Pla Jussi

6) Using the Folium Library to generate the Map of Paris showing the Location of Restaurants in the form of Blue Markers.



7) Performing Exploratory Data Analysis to Determine the Number of Each Type of Restaurants present in Paris and Visualizing the

Information in the Form of a Bar Chart using the Seaborn Library.

Let's Represent this Information in the form of a Pandas Dataframe as follows.

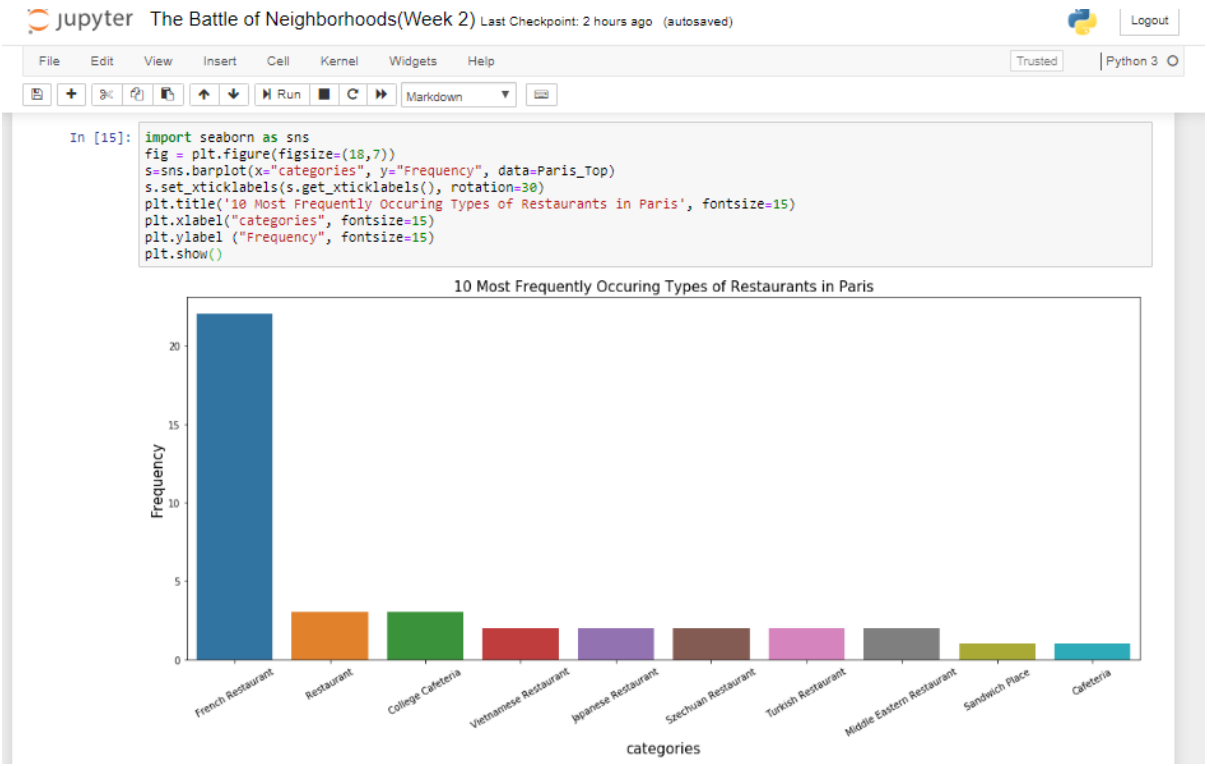
In [14]:
```
Paris_Top = dataframe_paris['categories'].value_counts()[0:10].to_frame(name='frequency')
Paris_Top=Paris_Top.reset_index()


Paris_Top.rename(index=str, columns={"index": "categories", "frequency": "Frequency"}, inplace=True)
Paris_Top
```

Out[14]:

	categories	Frequency
0	French Restaurant	22
1	Restaurant	3
2	College Cafeteria	3
3	Vietnamese Restaurant	2
4	Japanese Restaurant	2
5	Szechuan Restaurant	2
6	Turkish Restaurant	2
7	Middle Eastern Restaurant	2
8	Sandwich Place	1
9	Cafeteria	1

(This gives an idea of the type of Restaurants present in Paris)



8) Taking Proximity as a Parameter and performing a similar exploratory data analysis as we did while determining the type of Restaurant, A New Dataframe is created by merging the smaller Dataframes which consist of name of the restaurant, its type and the Dataframe is sorted on the basis of distance from the centre.

```
In [43]: FR6 = FR5.sort_values(by ='distance' )
         FR6.head(20)
```

Out[43]:

	index	name	categories	distance
16	16	Restaurant Viet	Vietnamese Restaurant	131
42	42	Restaurant Shiso	Japanese Restaurant	330
0	0	Restaurant Aux Tours de Notre-Dame	French Restaurant	373
32	32	Restaurant Istamboul	Sandwich Place	396
29	29	Restaurant Jardin Notre-Dame	French Restaurant	573
45	45	Restaurant Les Degrés de Notre Dame	French Restaurant	603
3	3	Le Restaurant des Poètes	French Restaurant	626
49	49	Restaurant 't Nieuwe Kafe	Arepa Restaurant	786
38	38	Restaurant AT	Japanese Restaurant	820
28	28	Restaurant Le Sinner	French Restaurant	863
37	37	Restaurant Erh	French Restaurant	885
1	1	Restaurant Le Mona Lisa	French Restaurant	895
5	5	Restaurant de l'Institut du Monde Arabe.	Middle Eastern Restaurant	963
43	43	Restaurant Le Luigi	Italian Restaurant	1056
9	9	Restaurant administratif	Restaurant	1186
8	8	Le Restaurant de L'Hôtel	French Restaurant	1197
6	6	Restaurant Hotel Little Palace	Restaurant	1201
12	12	Restaurant Au 35	French Restaurant	1343
11	11	Restaurant universitaire Crous de Censier	College Cafeteria	1353
44	44	Restaurants du Monde	Food Court	1372

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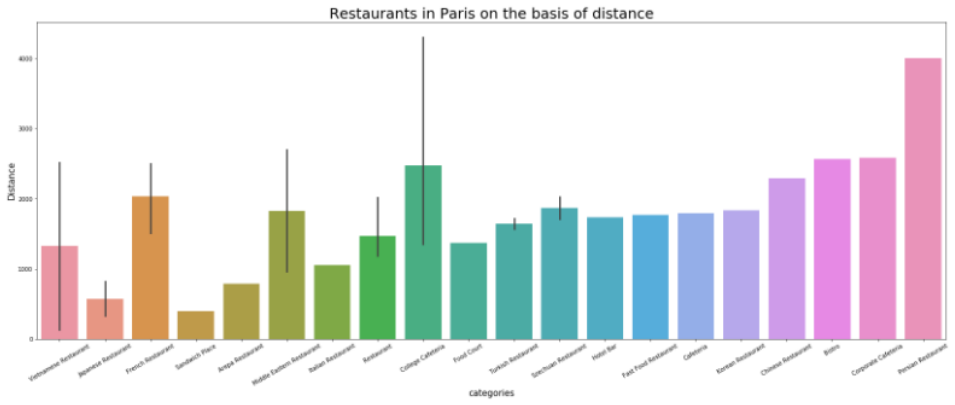
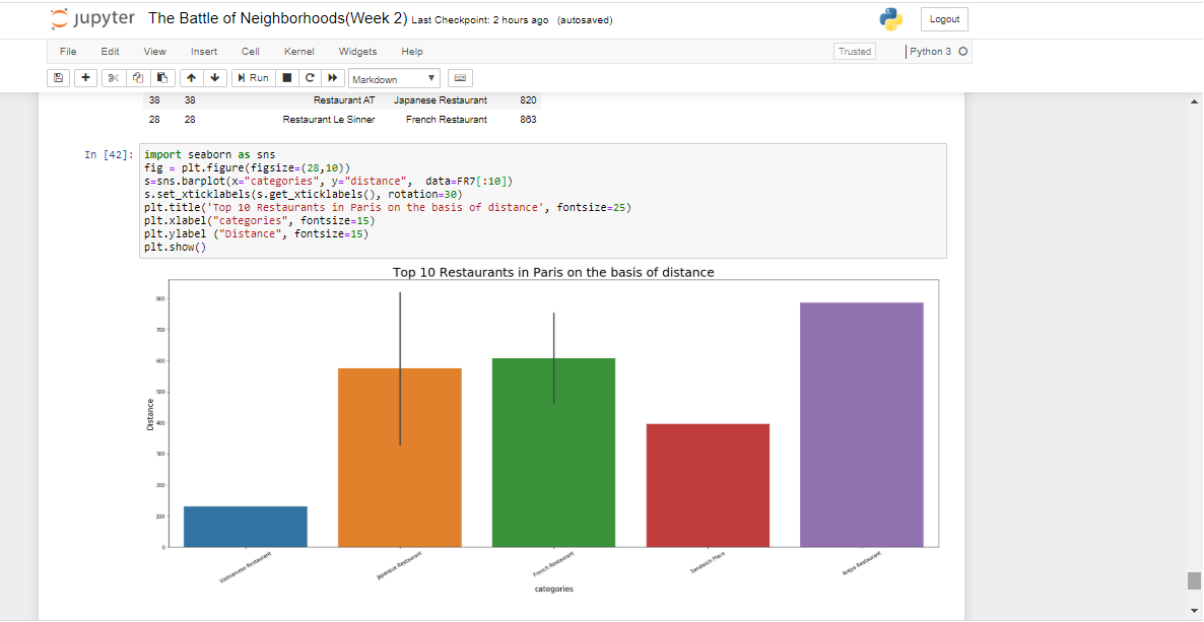
```
In [29]: import seaborn as sns
         fig = plt.figure(figsize=(28,10))
         s=sns.barplot(x="categories", y="distance",  data=FR6)
         s.set_xticklabels(s.get_xticklabels(), rotation=30)
         plt.title('Restaurants in Paris on the basis of distance', fontsize=25)
         plt.xlabel("categories", fontsize=15)
         plt.ylabel ("Distance", fontsize=15)
         plt.show()
```

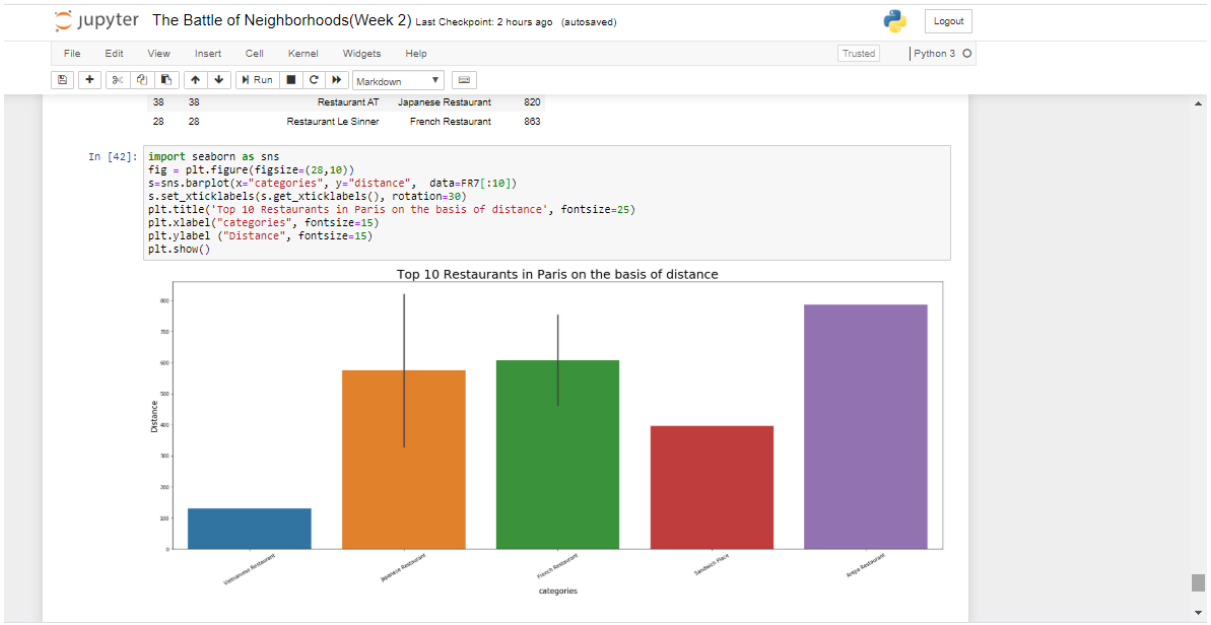


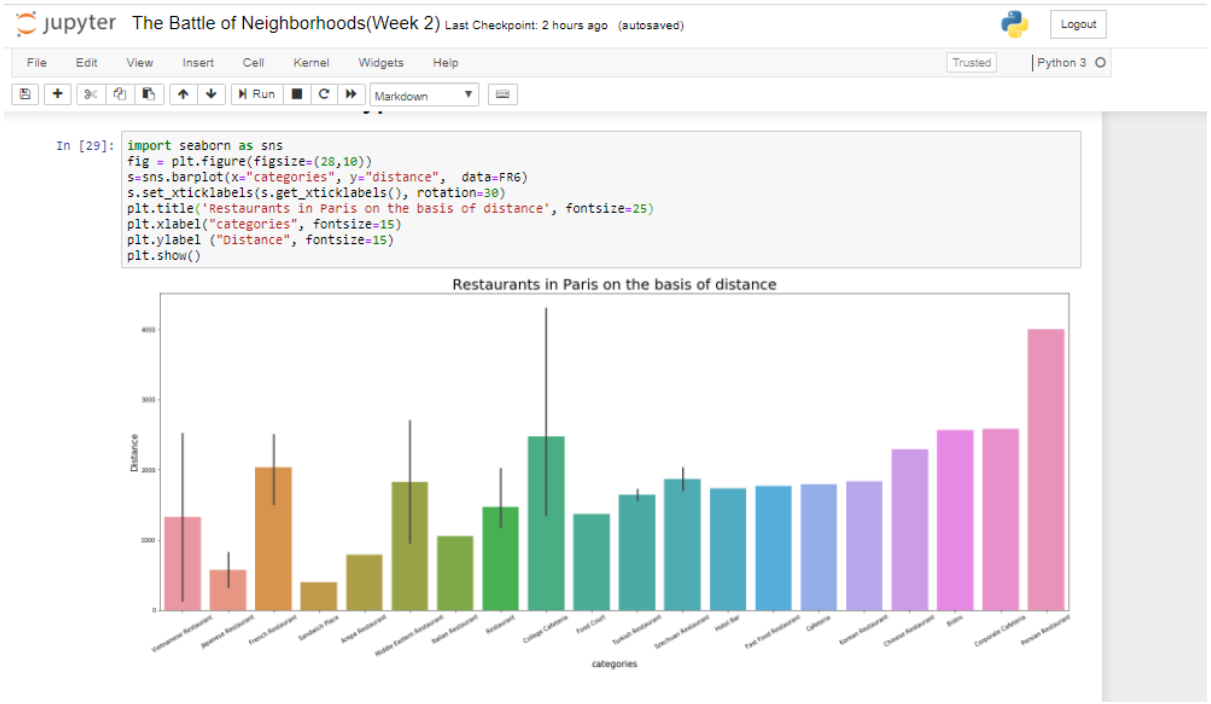
9) This information is visualized along with the top 10 restaurants in this Dataframe which gives the final result.



4) <u>RESULTS: -</u> We get an Insight of the types of Restaurants which are mostly present in Paris other than the type of French Restaurants as well like Vietnamese, Japanese, Turkish and other types. This information is beneficial as follows:- Suppose A Tourist Decides to visit Paris and is not sure about which type of food is available apart from the French type restaurants as there are many types of food all across the world. This analysis gives an insight of the types of Restaurant Options one can consider while planning to Visit Paris.

Also when we take Distance into Account, We get a more detailed view of the type of Restaurants which are ideal to be visited by a tourist in Paris. Along with the French Restaurants, The Japanese and the Vietnamese Restaurants are ideal options as well since they are near to the centre.





5) <u>DISCUSSIONS:</u> - One of the most important observations I noted while analysing the type of Restaurants and their distance is apart from the French Restaurants which are common in Paris, The restaurants of different origin like Japanese, Vietnamese were also present much nearer to

the centre which gives a tourist a variety of choices and diverse options without a lot of travelling and spending a lot of money.

Based on the Results, I want to recommend the Japanese and Vietnamese Restaurants along with the College Cafeterias apart from the French Restaurants for a better plethora of choices of food which can help a tourist to plan which restaurant to visit beforehand.

Also, I tried to integrate the Restaurants on the basis of address but I was not able to find a proper dataset of the postal addresses which would have made the project better since it would have given me an option to apply Machine Learning Algorithms like K-Means Clustering to describe the Restaurants in the form of Clusters.

6) <u>CONCLUSION</u>: -

To conclude with the Report, I would like to emphasize on the fact that this project will be a good guide to the tourists who want to explore Paris and the various food options offered by the city along with its traditional French Food. It will also give the tourists an idea of the other types of restaurants which are quite near from the centre and will help the tourists to plan the places they would like to eat without spending a lot on travelling and money.