

**The Battle of the neighborhoods**

# **Opening Five Italian Restaurants in Paris**

# Introdcution

An Italian restaurant chain is expanding in Europe. After having opened restaurants in several countries it wishes to set up in France by opening five restaurants in Paris. Given the increased competition in Paris they wish to choose their location scrupulously in order to ensure success. I've been given the task of assisting them to make data-driven decisions on the new locations that are most suitable for their new restaurants in Paris.

The restaurant chain does not serve haute cuisine dishes but rather dishes having good value for money. Thus, they will not open restaurants in upscale neighborhoods. They will look for areas of Paris where there is the **least competition** (the least possible of Italian restaurants) In addition, they do not want to choose a neighborhood where there is **already a renowned Italian restaurant**.

Therefore, thanks to the data analysis I will select the districts of Paris having the least Italian restaurants, study these districts, and evaluate the competition.

## Data section:

Paris is divided into 20 districts (or administrative districts), shortened to just "arrondissements". They are referenced by the arrondissement number rather than a name.

Data for the arrondissements was selected from Open|DATA France: <https://opendata.paris.fr/explore/dataset/arrondissements/table/?dataChart>

Data for districts of Paris should be sought and an appropriate usable source identified. If it is found but is not in a usable form, data analysis and cleaning should be done.

The cleaned data will then be used alongside the Foursquare data, which is readily available. Foursquare location data will be used to explore or compare neighborhoods in Paris and find the districts with the least Italian restaurants. Top venues data will then be used to find out if these districts already contain a renowned Italian restaurant.

## Methodology:

In this section I will use neighborhood location values to analyze Paris geographical structure.

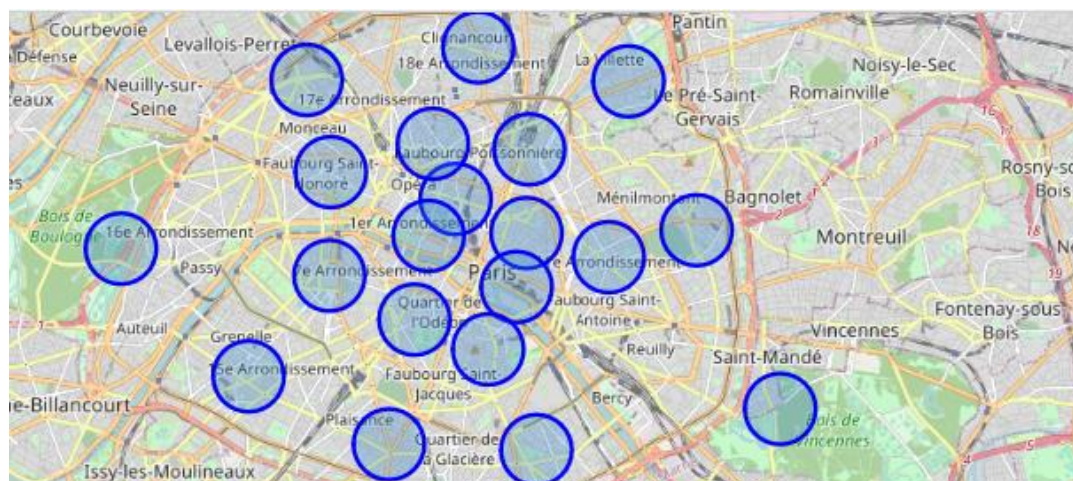
-Data for the arrondissements of paris was selected, reorganized in a dataframe and cleaned.

This following data frame contains the geographic coordinates of each arrondissement.

	Arrondissement_Num	Neighborhood	French_Name	Latitude	Longitude
0	3	Temple	3eme Ardt	48.862872	2.360001
1	19	Buttes-Chaumont	19eme Ardt	48.887076	2.384821
2	14	Observatoire	14eme Ardt	48.829245	2.326542
3	10	Entrepot	10eme Ardt	48.876130	2.360728
4	12	Reuilly	12eme Ardt	48.834974	2.421325
5	16	Passy	16eme Ardt	48.860392	2.261971
6	11	Popincourt	11eme Ardt	48.859059	2.380058
7	2	Bourse	2eme Ardt	48.868279	2.342803
8	4	Hotel-de-Ville	4eme Ardt	48.854341	2.357630
9	17	Batignolles-Monceau	17eme Ardt	48.887327	2.306777
10	18	Buttes-Montmartre	18eme Ardt	48.892569	2.348161
11	1	Louvre	1er Ardt	48.862563	2.336443
12	5	Pantheon	5eme Ardt	48.844443	2.350715
13	7	Palais-Bourbon	7eme Ardt	48.856174	2.312188
14	20	Menilmontant	20eme Ardt	48.863461	2.401188
15	8	elysee	8eme Ardt	48.872721	2.312554
16	9	Opera	9eme Ardt	48.877164	2.337458
17	13	Gobelins	13eme Ardt	48.828388	2.362272
18	15	Vaugirard	15eme Ardt	48.840085	2.292826
19	6	Luxembourg	6eme Ardt	48.849130	2.332898

We now have located and imported the relevant data for the districts of Paris, and have constructed a dataframe. Our business objective, strategy and methods to achieve our goal have been laid out, and a data workflow established. Next up, we will leverage Foursquare location data to obtain data on suitable arrondissements for opening the Italian Restaurant

I will use folium library of python to draw maps by using given latitude and longitudes of neighborhoods. Selected features will be as below



I will also classify neighborhoods by using venues distribution and counts. In this way, I will find particularity of neighborhoods which will help me to choose location for opening the new restaurants. Arrondissements with few Italian Restaurants may be an option

I will first Create a nearby venues function for all the neighborhoods in Paris from Foursquare location data. The data frame contains all top 100 venues for all of the arrondissement.

	French_Name	Latitude	Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
0	3eme Ardt	48.862872	2.360001	Mmmozza	48.863910	2.360591	Sandwich Place
1	3eme Ardt	48.862872	2.360001	Square du Temple	48.864475	2.360816	Park
2	3eme Ardt	48.862872	2.360001	Marché des Enfants Rouges	48.862806	2.361996	Farmers Market
3	3eme Ardt	48.862872	2.360001	Chez Alain Miam Miam	48.862781	2.362064	Sandwich Place
4	3eme Ardt	48.862872	2.360001	Chez Alain Miam Miam	48.862369	2.361950	Sandwich Place
5	3eme Ardt	48.862872	2.360001	Fromagerie Jouannault	48.862947	2.362530	Cheese Shop
6	3eme Ardt	48.862872	2.360001	Les Enfants Rouges	48.863013	2.361260	Wine Bar
7	3eme Ardt	48.862872	2.360001	Okomusu	48.861453	2.360879	Okonomiyaki Restaurant
8	3eme Ardt	48.862872	2.360001	Hôtel Jules & Jim	48.863496	2.357395	Hotel
9	3eme Ardt	48.862872	2.360001	Musée de la Chasse et de la Nature	48.861507	2.358624	Museum

The frequency of occurrence of each category of venues by arrondissement is displayed in the following dataframe.

	Neighborhood	Afghan Restaurant	African Restaurant	American Restaurant	Antique Shop	Argentinian Restaurant	Art Gallery	Art Museum	Arts & Crafts Store	Asian Restaurant
0	10eme Ardt	0.000000	0.02	0.000000	0.00	0.000000	0.000000	0.000000	0.000000	0.020000
1	11eme Ardt	0.014925	0.00	0.000000	0.00	0.000000	0.000000	0.014925	0.000000	0.014925
2	12eme Ardt	0.000000	0.00	0.000000	0.00	0.000000	0.000000	0.000000	0.000000	0.000000
3	13eme Ardt	0.000000	0.00	0.000000	0.00	0.000000	0.000000	0.000000	0.000000	0.200000
4	14eme Ardt	0.000000	0.00	0.000000	0.00	0.000000	0.000000	0.000000	0.000000	0.000000
5	15eme Ardt	0.000000	0.00	0.000000	0.00	0.000000	0.000000	0.000000	0.016393	0.000000
6	16eme Ardt	0.000000	0.00	0.000000	0.00	0.000000	0.000000	0.090909	0.000000	0.000000
7	17eme Ardt	0.000000	0.00	0.000000	0.00	0.000000	0.000000	0.016949	0.000000	0.016949
8	18eme Ardt	0.000000	0.00	0.000000	0.00	0.000000	0.000000	0.000000	0.000000	0.000000
9	19eme Ardt	0.000000	0.00	0.02381	0.00	0.000000	0.000000	0.000000	0.000000	0.000000
10	1er Ardt	0.000000	0.00	0.000000	0.00	0.000000	0.000000	0.042254	0.000000	0.000000
11	20eme Ardt	0.000000	0.00	0.000000	0.00	0.000000	0.000000	0.000000	0.000000	0.000000
12	2eme Ardt	0.000000	0.00	0.000000	0.00	0.000000	0.000000	0.000000	0.000000	0.010000
13	3eme Ardt	0.000000	0.00	0.000000	0.00	0.011905	0.047619	0.011905	0.000000	0.000000
14	4eme Ardt	0.000000	0.01	0.000000	0.00	0.000000	0.020000	0.010000	0.010000	0.000000
15	5eme Ardt	0.000000	0.00	0.000000	0.00	0.000000	0.000000	0.000000	0.000000	0.000000
16	6eme Ardt	0.000000	0.00	0.000000	0.00	0.000000	0.000000	0.025000	0.000000	0.000000
17	7eme Ardt	0.000000	0.00	0.000000	0.00	0.000000	0.000000	0.020000	0.000000	0.010000
18	8eme Ardt	0.000000	0.00	0.000000	0.00	0.000000	0.060606	0.030303	0.000000	0.000000
19	9eme Ardt	0.000000	0.01	0.000000	0.01	0.000000	0.000000	0.000000	0.000000	0.000000

Since we are only interested in Italian Restaurants we selected the corresponding column and selected the arrondissements having the lowest frequency mean.

	Neighborhood	Italian Restaurant
6	16eme Ardt	0.000000
2	12eme Ardt	0.000000
3	13eme Ardt	0.016667
0	10eme Ardt	0.020000
19	9eme Ardt	0.020000

Then I used **Foursquare API venues method** to get ranks of restaurants by given venue id.

	Neighborhood	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue
0	10eme Ardt	French Restaurant	Bistro	Coffee Shop	Café	Hotel	Indian Restaurant	Japanese Restaurant	Pizza Place
1	11eme Ardt	French Restaurant	Supermarket	Restaurant	Pastery Shop	Wine Bar	Café	Bar	Italian Restaurant
2	12eme Ardt	Zoo Exhibit	Supermarket	Monument / Landmark	Zoo	Antique Shop	Dive Bar	Flower Shop	Fish & Chips Shop
3	13eme Ardt	Vietnamese Restaurant	Asian Restaurant	French Restaurant	Chinese Restaurant	Thai Restaurant	Juice Bar	Brasserie	Coffee Shop
4	14eme Ardt	French Restaurant	Hotel	Convenience Store	Bakery	Food & Drink Shop	Brasserie	Pizza Place	Bistro
5	15eme Ardt	Italian Restaurant	French Restaurant	Hotel	Coffee Shop	Thai Restaurant	Supermarket	Brasserie	Japanese Restaurant
6	16eme Ardt	Plaza	Lake	Park	French Restaurant	Boat or Ferry	Art Museum	Bus Station	Bus Stop
7	17eme Ardt	Hotel	French Restaurant	Italian Restaurant	Japanese	Plaza	Bistro	Bakery	Restaurant

## Results:

I only displayed the previously selected arrondissements: 9,10,12,13 and 16eme arrondissement.

We needed to check if there was any Italian Restaurant among the famous venues in these arrondissements.

	Neighborhood	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue	9th Most Common Venue
6	16eme Ardt	Plaza	Lake	Park	French Restaurant	Boat or Ferry	Art Museum	Bus Station	Bus Stop	Zoo Exhibit
2	12eme Ardt	Zoo Exhibit	Supermarket	Monument / Landmark	Zoo	Antique Shop	Dive Bar	Flower Shop	Fish & Chips Shop	Fast Food Restaurant
3	13eme Ardt	Vietnamese Restaurant	Asian Restaurant	French Restaurant	Chinese Restaurant	Thai Restaurant	Juice Bar	Brasserie	Coffee Shop	Butcher
0	10eme Ardt	French Restaurant	Bistro	Coffee Shop	Café	Hotel	Indian Restaurant	Japanese Restaurant	Pizza Place	Korean Restaurant
19	9eme Ardt	French Restaurant	Hotel	Cocktail Bar	Bakery	Bistro	Lounge	Wine Bar	Japanese Restaurant	Turkish Restaurant

As we can see there are no Italian Restaurants among the top 10 venues in the selected Arrondissements.

## **Discussion and Conclusions:**

We have implemented a project using Foursquare location data to explore and compare the districts of Paris and choose a suitable location for the opening of the five restaurants in the chain. In the first place, we searched for and selected the districts containing the fewest Italian restaurants. Next, we sought to assess the possible competition that well-known restaurants could represent within these boroughs. The boroughs selected at the end of this study are as follows:

- 9eme arrondissement**
- 10eme arrondissement**
- 12eme arrondissement**
- 13eme arrondissement**
- 16eme arrondissement**

This is a preliminary study which allowed us to select the districts of Paris where there is room for another Italian restaurant. It is one approach among many. In fact, there are several factors that can condition the success of these establishments, such as the purchasing power of the inhabitants or the attendance rate of these districts.