

The best arrondissement for tourists in Paris

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February, 9th, 2021

1. Introduction

Paris is the most visited city in the whole world. Many tourists love it and many end up hating it!

Being a multicultural city with each arrondissements having its all peculiar characteristics. The ancient old question arises for every tourist planning to visit Paris, "Where should I stay?".

The present report aims to analyze the diversity of each arrondissement. Leaving a better notion of where should tourists choose to stay accordingly to their preferences.

2. Business problem

Paris is a big city and each arrondissements have different characteristics. A tourist that has never been to Paris faces the dilemma of which arrondissements should they stay.

This report aims in to evaluate the best arrondissement for a tourist to stay accordingly to their trip preferences.

3. Data description

Geolocation data for Paris was obtained at <https://www.data.gouv.fr/fr/datasets/r/e88c6fda-1d09-42a0-a069-606d3259114e>

Postal codes of the city serve as a starting point. Using postal codes it's possible to find out the arrondissement, venues and their most popular venues categories.

The JSON file has data about all the cities in France, in the assignment the city of Paris was limited so its arrondissement could be accessed and analyzed.

4. Methodology

Firstly, all the packages that were needed in the notebook were imported and/or installed.

In the data collection stage, the required data for the city of Paris was obtained from the French government site. The data collected contained postal codes, neighborhoods and boroughs of the whole country of France.

Then, the data was processed breaking down nested fields and creating a dataframe.

A new dataframe was formed composed only for the postal code, neighborhoods and latitude and longitude (geo_point_2d column).

The dataset is adjusted and limited to only contain the city of Paris. Using the `folium` package the map of Paris with all the twenty arrondissements (figure 1).

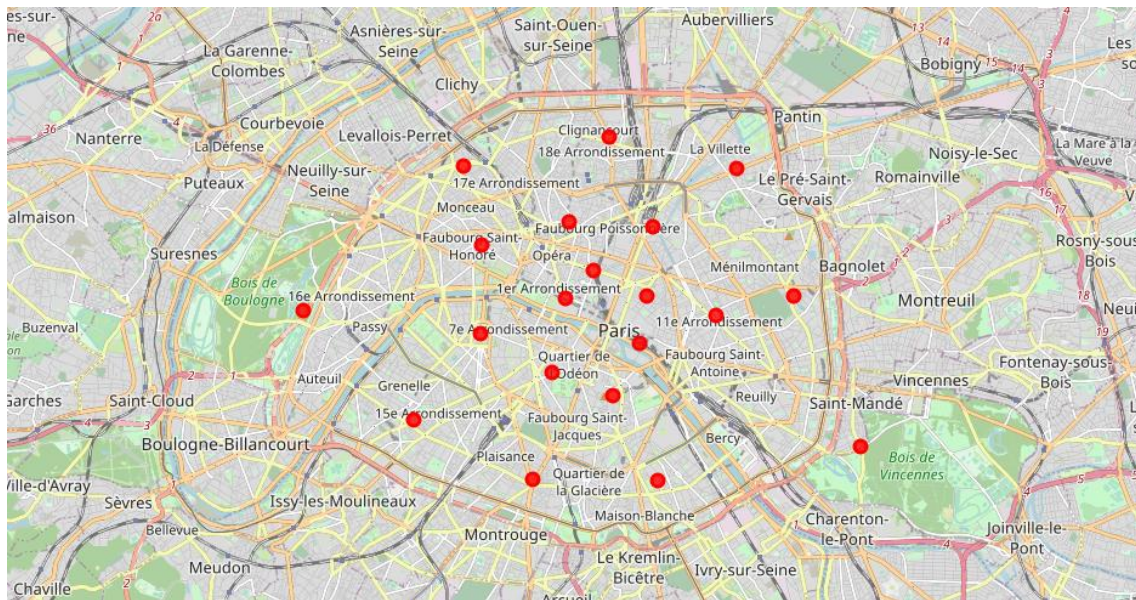


Figure 1: Map of the Paris' arrondissements.

After, the map is obtained, it's necessary to find out what each neighborhood is like and what are the common venue and venue categories within a 500m radius. And for that Foursquare is used.

Utilizing Foursquare, a function is defined which collects information pertaining to each arrondissement including that of the name of the arrondissement, and its coordinates, venue and venue categories.

Since we are trying to find out what are the different kinds of venue categories present in each arrondissement and then calculate the top 10 common venues to base our similarity on, One Hot Encoding is used to work with the categorical datatype of the venue categories. This helps to convert the categorical data into numeric data.

One hot encoding is performed and then calculate the mean of the grouped venue categories for each of the arrondissement.

In the next step, the top venue categories in our arrondissement were ranked and labeled using a function. Only ten categories were considered to avoid data skew. A function to label de venues properly was created.

To build the model, K Means clustering was used to cluster similar arrondissement. The number of 5 clusters was chosen to make it simpler to analyze.

5. Results

The city was divided in 5 different clusters accordingly to its characteristics. The map of Paris divided into clusters can be seen in the figure bellow.

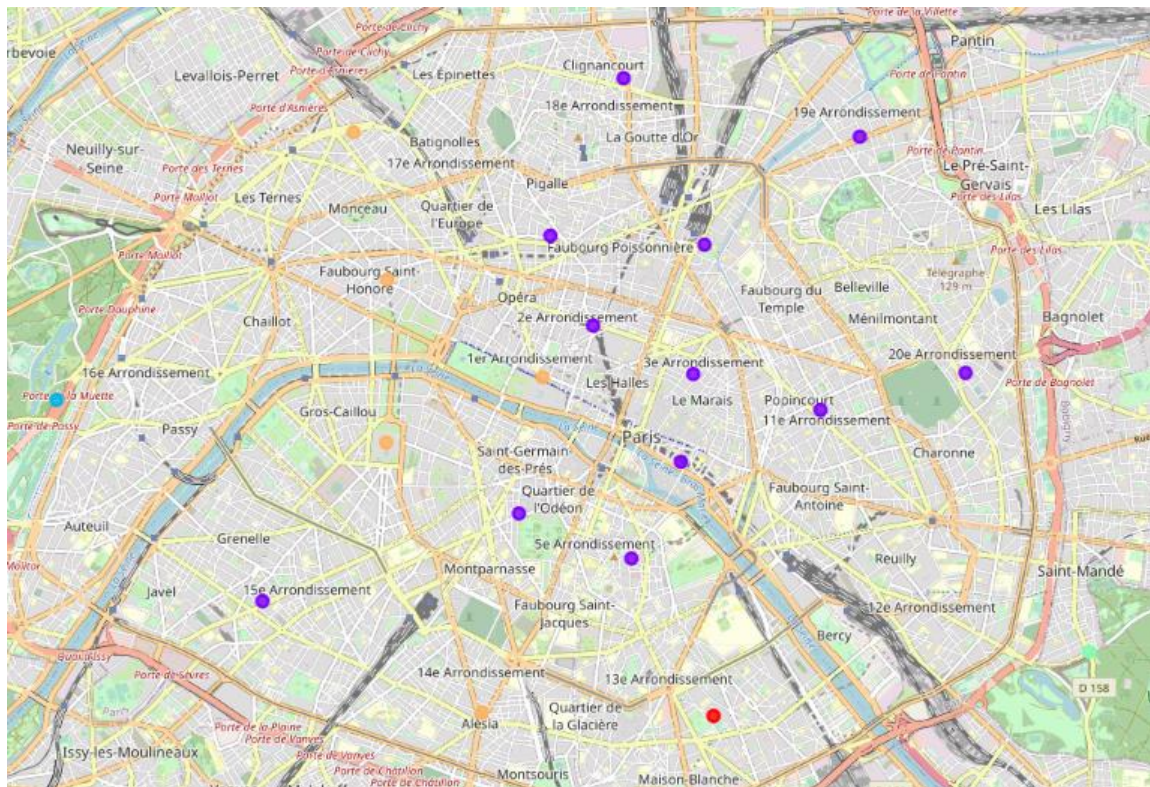


Figure 2: Paris divided into 5 clusters.

The results from the clusters can be seen in the tables bellow.

	nom_comm	Cluster Labels	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	10th Most Common Venue
0	PARIS-9E-ARRONDISSEMENT	1	French Restaurant	Hotel	Bistro	Japanese Restaurant	Bakery	Wine Bar	Lounge	Cocktail Bar	Plaza	Gym / Fitness Center
1	PARIS-2E-ARRONDISSEMENT	1	French Restaurant	Cocktail Bar	Wine Bar	Hotel	Italian Restaurant	Creperie	Bakery	Coffee Shop	Furniture / Home Store	Pedestrian Plaza
2	PARIS-11E-ARRONDISSEMENT	1	Restaurant	French Restaurant	Café	Bar	Vietnamese Restaurant	Pastry Shop	Bakery	Italian Restaurant	Bistro	South American Restaurant
3	PARIS-3E-ARRONDISSEMENT	1	French Restaurant	Coffee Shop	Japanese Restaurant	Art Gallery	Italian Restaurant	Bakery	Gourmet Shop	Burger Joint	Sandwich Place	Cocktail Bar
4	PARIS-6E-ARRONDISSEMENT	1	Bakery	French Restaurant	Chocolate Shop	Plaza	Wine Bar	Fountain	Electronics Store	Bistro	Garden	Bookstore
5	PARIS-4E-ARRONDISSEMENT	1	French Restaurant	Ice Cream Shop	Clothing Store	Park	Hotel	Plaza	Wine Bar	Pastry Shop	Pedestrian Plaza	Tea Room
11	PARIS-5E-ARRONDISSEMENT	1	French Restaurant	Hotel	Italian Restaurant	Plaza	Bakery	Café	Coffee Shop	Pub	Creperie	Vietnamese Restaurant
12	PARIS-19E-ARRONDISSEMENT	1	French Restaurant	Bar	Supermarket	Hotel	Café	Beer Bar	Seafood Restaurant	Bistro	Creperie	Sandwich Place
13	PARIS-20E-ARRONDISSEMENT	1	Bakery	Plaza	Bistro	French Restaurant	Japanese Restaurant	Italian Restaurant	Park	Hotel	Café	Bus Stop
14	PARIS-10E-ARRONDISSEMENT	1	French Restaurant	Bistro	Hotel	Café	Coffee Shop	Pizza Place	Italian Restaurant	Indian Restaurant	Asian Restaurant	Burger Joint
16	PARIS-18E-ARRONDISSEMENT	1	Bar	French Restaurant	Plaza	Pizza Place	Bistro	Restaurant	Café	Italian Restaurant	Hotel	Vietnamese Restaurant
18	PARIS-15E-ARRONDISSEMENT	1	Italian Restaurant	Hotel	French Restaurant	Restaurant	Thai Restaurant	Park	Brasserie	Lebanese Restaurant	Japanese Restaurant	Bistro

Figure 3: Cluster 1

	nom_comm	Cluster Labels	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	10th Most Common Venue
15	PARIS-16E-ARRONDISSEMENT	2	Plaza	Lake	Bus Stop	Pool	Park	French Restaurant	Boat or Ferry	Art Museum	Bus Station	Zoo Exhibit

Figure 4: Cluster 2

	nom_comm	Cluster Labels	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	10th Most Common Venue
10	PARIS-12E-ARRONDISSEMENT	3	Zoo Exhibit	Supermarket	Monument / Landmark	Bistro	Zoo	Argentinian Restaurant	African Restaurant	Frozen Yogurt Shop	French Restaurant	Fountain

Figure 5: Cluster 3

	nom_comm	Cluster Labels	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	10th Most Common Venue
6	PARIS-1ER-ARRONDISSEMENT	4	French Restaurant	Japanese Restaurant	Hotel	Plaza	Italian Restaurant	Art Museum	Tea Room	Historic Site	Garden	Udon Restaurant
7	PARIS-17E-ARRONDISSEMENT	4	Hotel	French Restaurant	Italian Restaurant	Bakery	Japanese Restaurant	Café	Restaurant	Plaza	Bistro	Burger Joint
8	PARIS-8E-ARRONDISSEMENT	4	French Restaurant	Hotel	Corsican Restaurant	Cocktail Bar	Spa	Theater	Plaza	Hotel Bar	Resort	Park
17	PARIS-7E-ARRONDISSEMENT	4	French Restaurant	Hotel	Café	Italian Restaurant	Plaza	Cocktail Bar	History Museum	Coffee Shop	Restaurant	Garden
19	PARIS-14E-ARRONDISSEMENT	4	French Restaurant	Hotel	Plaza	Food & Drink Shop	Bistro	Bakery	Sushi Restaurant	Laundromat	Brasserie	Italian Restaurant

Figure 6: Cluster 4

	nom_comm	Cluster Labels	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	10th Most Common Venue
9	PARIS-13E-ARRONDISSEMENT	5	Vietnamese Restaurant	Asian Restaurant	Thai Restaurant	Chinese Restaurant	French Restaurant	Bus Stop	Plaza	Juice Bar	Sandwich Place	Farmers Market

Figure 7: Cluster 5

6. Discussion

Paris is a lively city. It has a wide variety of restaurants of different cuisines. There are a lot of places to go and have some fun such as restaurants and Bars. Paris seems like a great city for tourists to visit with all its museums, parks, art galleries and history. Paris seems as a multicultural city with lot of spots to go and have amusing trip.

If a tourist plans for a calm vacation with a lot of site seeing is better that he/she stays at the 16 arrondissement. On the other hand, If the tourist wants to be around many bars, and French restaurants he/she should stay at

arrondissements: 1 - 6, 9 - 11, 15, 18 -20. If the tourist has a strong preference for Asian food he/she would prefer to stay at the 13 arrondissement.

7. Conclusion

Paris is a great city for tourists to visit with a lot of things to do and places to go. The cuisine is rich and multiverse, making it impossible to don't find something to the tourist taste. Overall, Paris holds the title of the most visited city by tourists in the world for a great reason, all it's arrondissements present great options for diverse preferences.