

Coursera Capstone Project : the battle of neighborhood

1. Introduction :

I have been living in Paris for over a year now, and as in all major cities, it is always difficult for newcomers to find the best area to live in, so I will try to group the neighborhoods of Paris according to their venues, I'll also try to price of rent, which can help people trying to find new places to understand the city and choose according to their preferences and budget.

2. Data of Paris :

I will be using data from a website published by city council of paris :

https://opendata.paris.fr/explore/dataset/quartier_paris/export/

2 json files contains the list of districts, neighborhood of Paris, geospatial coordinates and also the price of rent euro per meter square, I will be using also Foursquare API to get the venues of each neighbourhood.

neighborhood, district, and geospatial coordinates :

District		Neighborhood	Latitude	Longitude
0	1	Halles,Saint-Germain-l'Auxerrois,Place-Vendôme...	48.863654	2.336175
1	2	Mail,Bonne-Nouvelle,Vivienne,Gaillon	48.868391	2.341918
2	3	Enfants-Rouges,Sainte-Avoie,Arts-et-Métiers,Ar...	48.863027	2.359566
3	4	Saint-Gervais,Arsenal,Saint-Merri,Notre-Dame	48.854680	2.356843
4	5	Jardin-des-Plantes,Saint-Victor,Val-de-Grâce,S...	48.845083	2.350149

the data of rent of every neighborhood (the price of rent is euro per meter square) :

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Neighborhood		Rent
0	Amérique	20.600000
1	Archives	26.659375
2	Arsenal	27.915625
3	Arts-et-Metiers	26.659375
4	Auteuil	25.137500

3. Methodology :

We are going to use Foursquare to find the venues of every district, and filter them based on the features that we want to compare,

We also gonna sort the 10 most common venues, and cluster the district with k means after finding the best number of clusters k using silouhette score,

Finally, we create a map of all districts with their cluster,

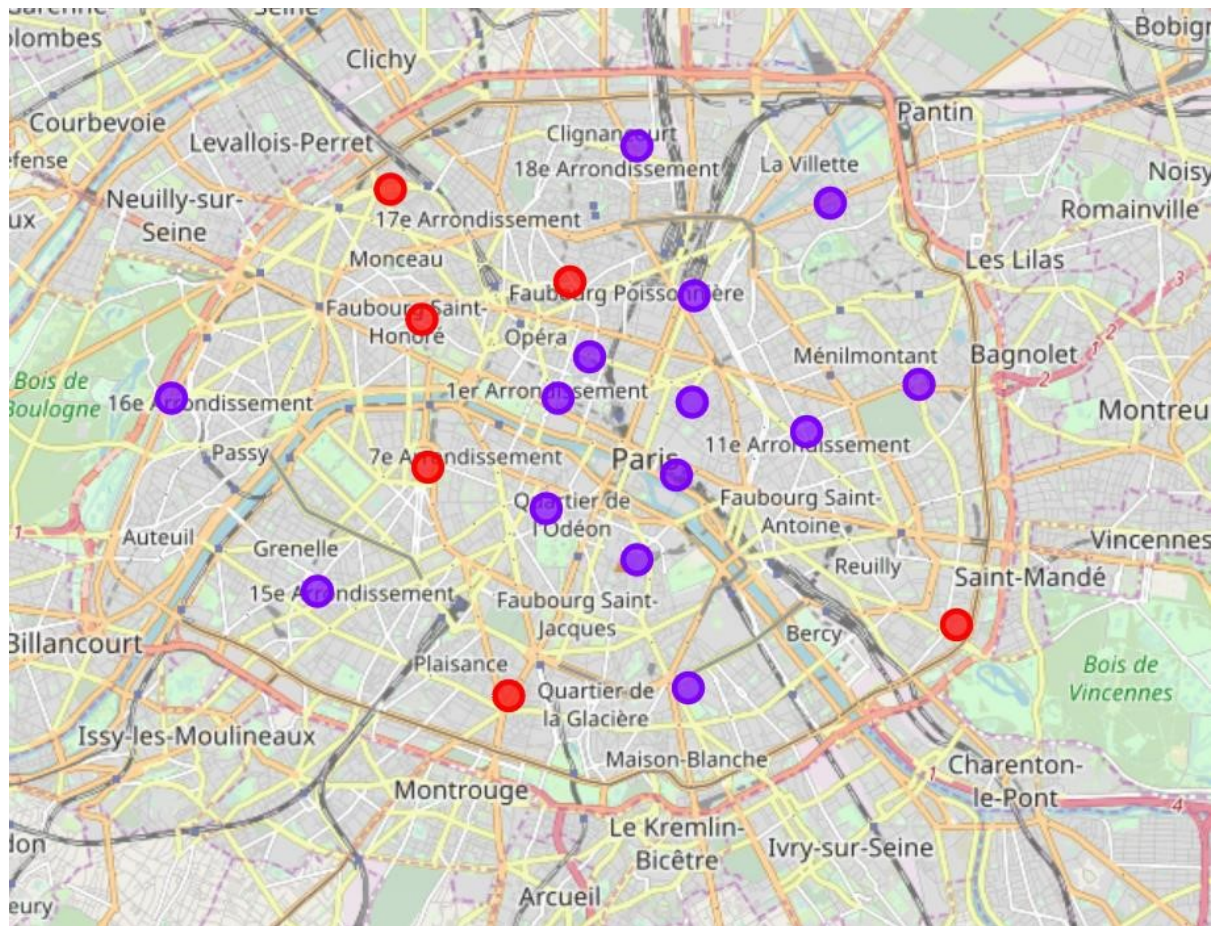
The result of the clusters 0 :

District		Neighborhood	Latitude	Longitude	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
6	7	Saint-Thomas-d'Aquin,Invalides,Gros-Cailloeu,Ec...	48.855609	2.313651	French Restaurant	Hotel	Café	Italian Restaurant	Art Museum	Coffee Shop	Japanese Restaurant	Korean Restaurant
7	8	Madeleine,Champs-Élysées,Faubourg-du-Roule,Europe	48.872656	2.312500	French Restaurant	Hotel	Cocktail Bar	Bar	Art Gallery	Theater	Park	Moderne European Restaurant
8	9	Rochechouart,Faubourg-Montmartre,Saint-Georges...	48.876807	2.338308	French Restaurant	Hotel	Cocktail Bar	Bar	Italian Restaurant	Japanese Restaurant	Cheese Shop	Café
11	12	Bercy,Bel-Air,Picpus,Quinze-Vingts	48.837620	2.405654	Hotel	Japanese Restaurant	French Restaurant	Park	Wine Shop	Supermarket	Fast Food Restaurant	Food & Drink Shop
13	14	Montparnasse,Plaisance,Petit-Montrouge,Parc-de...	48.829511	2.327649	French Restaurant	Sushi Restaurant	Supermarket	Hotel	Ice Cream Shop	Fast Food Restaurant	Food & Drink Shop	Café

The result of the clusters 1 :

District	Neighborhood	Latitude	Longitude	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
0	1	Halles,Saint-Germain-l'Auxerrois,Place-Vendôme...	48.863654	2.336175	Japanese Restaurant	French Restaurant	Café	Hotel	Coffee Shop	Ramen Restaurant	Udon Restaurant	Korean Restaurant
1	2	Mail,Bonne-Nouvelle,Vivienne,Gaillon	48.868391	2.341918	French Restaurant	Hotel	Wine Bar	Japanese Restaurant	Cocktail Bar	Italian Restaurant	Ice Cream Shop	Restaurant
2	3	Enfants-Rouges,Sainte-Avoie,Arts-et-Métiers,Ar...	48.863027	2.359566	French Restaurant	Coffee Shop	Café	Wine Bar	Japanese Restaurant	Italian Restaurant	Moroccan Restaurant	Chinese Restaurant
3	4	Saint-Gervais,Arsenal,Saint-Merri,Notre-Dame	48.854680	2.356843	French Restaurant	Ice Cream Shop	Hotel	Pastry Shop	Thai Restaurant	Wine Bar	Falafel Restaurant	Coffee Shop
4	5	Jardin-des-Plantes,Saint-Victor,Val-de-Grâce,S...	48.845083	2.350149	French Restaurant	Hotel	Italian Restaurant	Café	Coffee Shop	Pub	Bar	Wine Bar

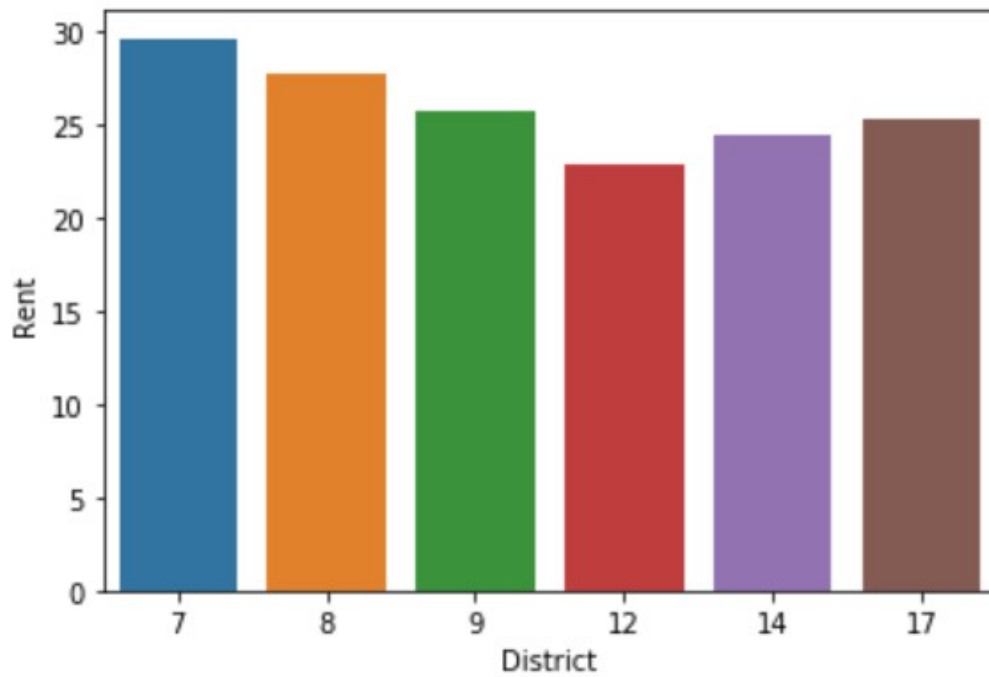
The map of paris with the clusters :



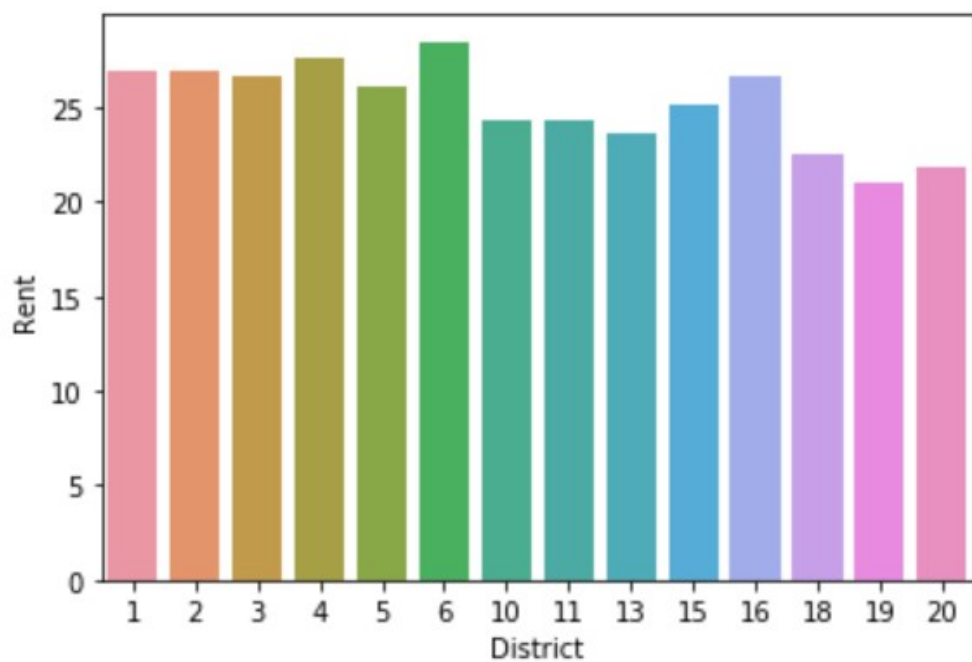
4. Analysing the clusters :

By analyzing the clusters we can see that cluster 1 is more residential since it contains lots of shops and a variety of restaurants while cluster 0 is more touristic and contains many hotels and french restaurant

The barplot of the cluster 0 :



The barplot of the cluster 1 :



5. Conclusion :

With this 2 figures and the maps we can find similaire District, and compare their prices of rent, we can also change the type of venues, this way we will only compare venues that we are interested in.

