Best location for a car rental agency in Paris

Business problem

▶ Paris being a city where relatively few people possess a car (due to excessive taxes and parking fees). So a car rental agency can be a juicy business because a lot of residents may need occasionally a car

▶ For this project let's put ourselves in the shoes of an entrepreneur looking to open a car rental agency. So for the location we have to find a balance between the real estate prices and the presence of competitors.

Data Description

To solve this problem we will use the following data :

▶ An excel file (Arrondissements_Paris.xlsx) downloaded from "Open platform for French public data" containing the list of all the Paris districts with their coordinates. [1]

▶ Foursquare API to get the car rental agencies for each district [2]

▶ The real estate prices for all Paris districts [3]

Paris districts visualization

Data set & method selection

- ▶ After some processing we obtain the following data set
- ▶ We used unsupervised learning K-means algorithm to cluster the districts because the data is unlabeled
- ▶ We applied K-means algorithm on the two last columns after normalizing them

PostalCode	District_Number	District_Name	Latitude	Longitude	average housing price	Car_rental_agencies
75001	1	Louvre	48.862563	2.336443	12840	17
75002	2	Bourse	48.868279	2.342803	11250	11
75003	3	Temple	48.862872	2.360001	12260	11
75004	4	Hôtel-de-Ville	48.854341	2.357630	12790	13
75005	5	Panthéon	48.844443	2.350715	12140	12

Clustering Paris districts with Kmeans method

Elbow Method For Optimal k
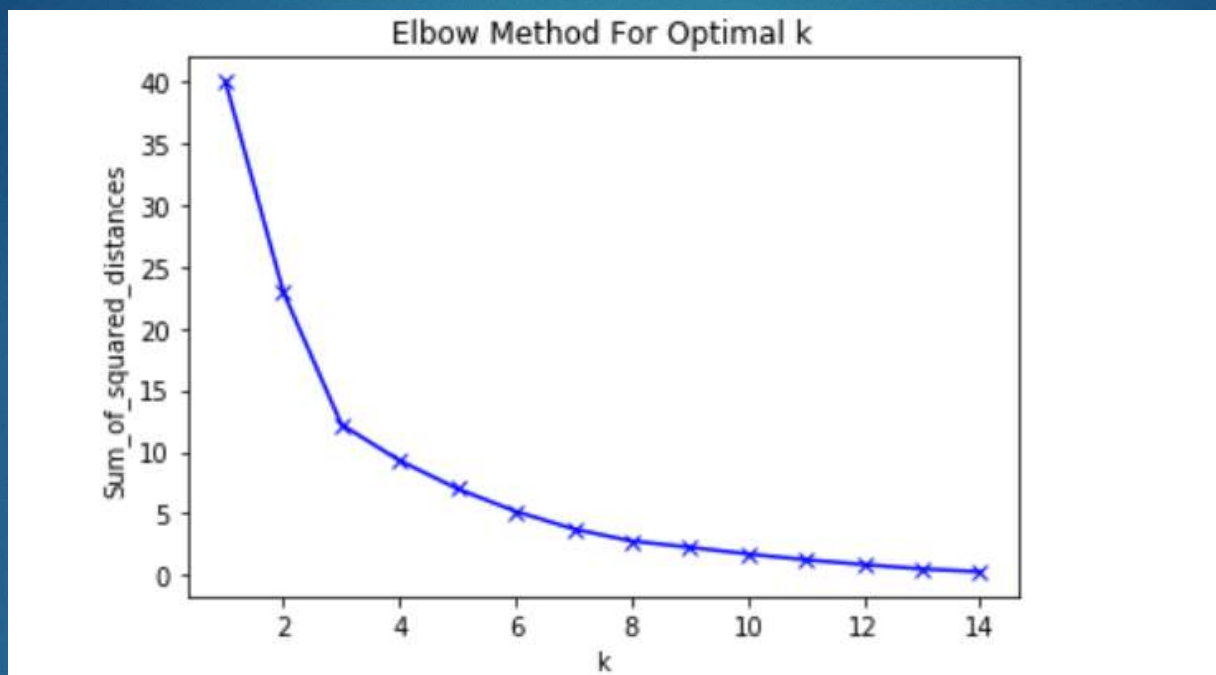
▶ In the plot above the elbow is at k=3 indicating the optimal k for this dataset is 3

Results : Clusters visualization
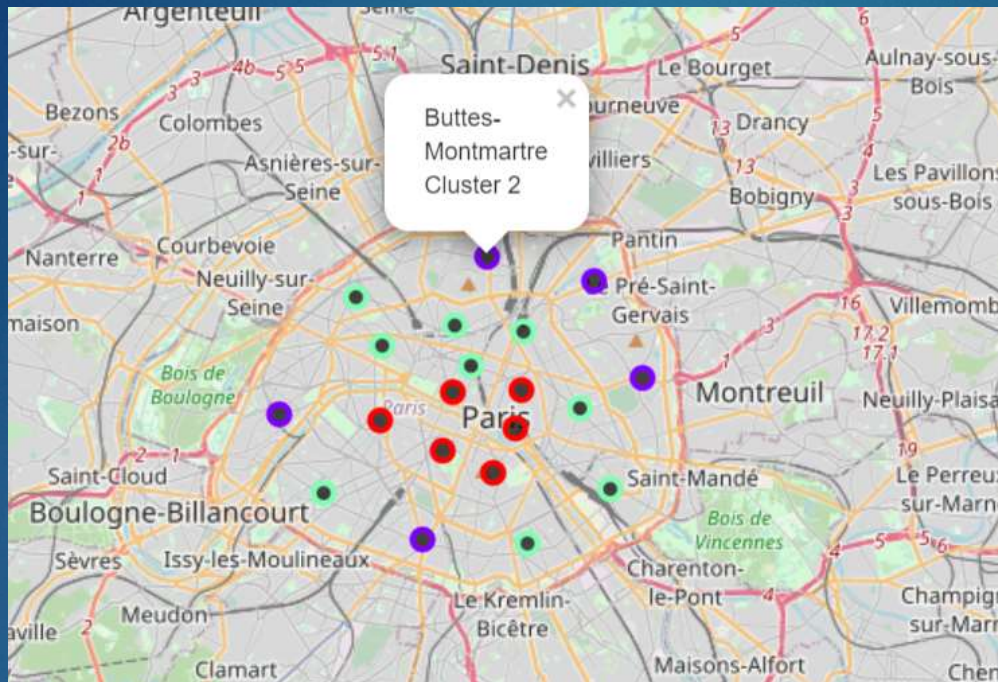
We can label the clusters as follows :

▶ Cluster 0 (green) : High number of car rental agencies and low housing prices

▶ Cluster 1 (red) : High number of car rental agencies and high housing prices

▶ Cluster 2 (purple) : low number of car rental agencies and low housing prices

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Results : clusters visualization with choropleth for housing prices
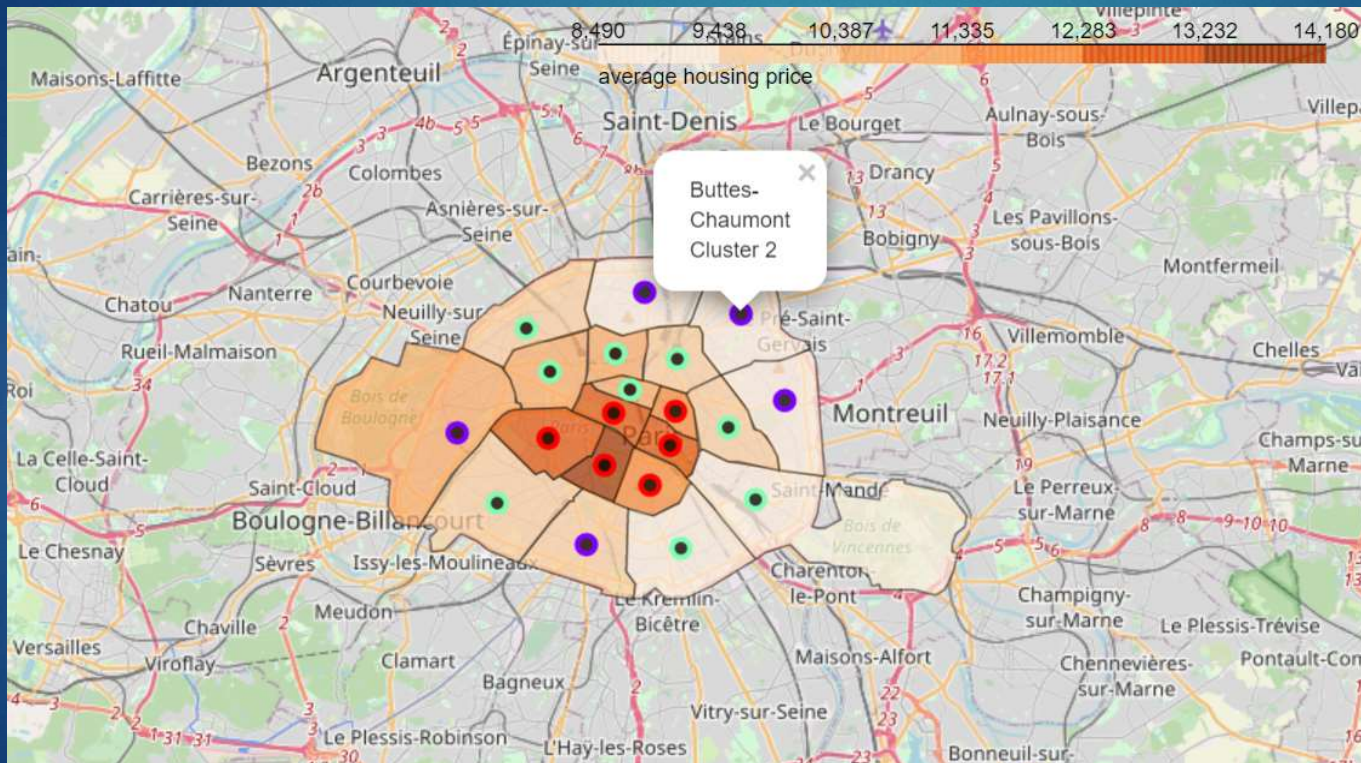
▶ We use choropleth map to better catch the level of variability and the contrast within paris

Discussion/conclusion

▶ It would be better chose to open a rental car agency in the districts labeled as cluster 2 (low number of car rental agencies and low housing prices)

▶ That is to say in one of the following districts : "Buttes-Montmartre","Buttes-Chaumont","Ménilmontant","Passy" or "Observatoire

▶ But the final decision has to take into account some more factors such as the road traffic and the availability of building lands.