Opening a new restaurant in Paris

Recommender system

Introduction

- Paris, city and capital of France, is by far the country’s most important center of commerce and culture. The 'City of Light' (la Ville Lumière), as commonly known, is one of the world's most important and attractive cities. It is particularly appreciated for its gastronomy which enjoys an enviable reputation.

- The choice of the location for a restaurant is the starting point, but also one of the most crucial decision. The success of the business can depend on this unique parameter.

- The objective of this analysis is to assist an entrepreneur wiling to open a new restaurant in Paris, in finding a good location, with regards to the type of venues nearby, the customer base, and the property prices.

Analytic Approach

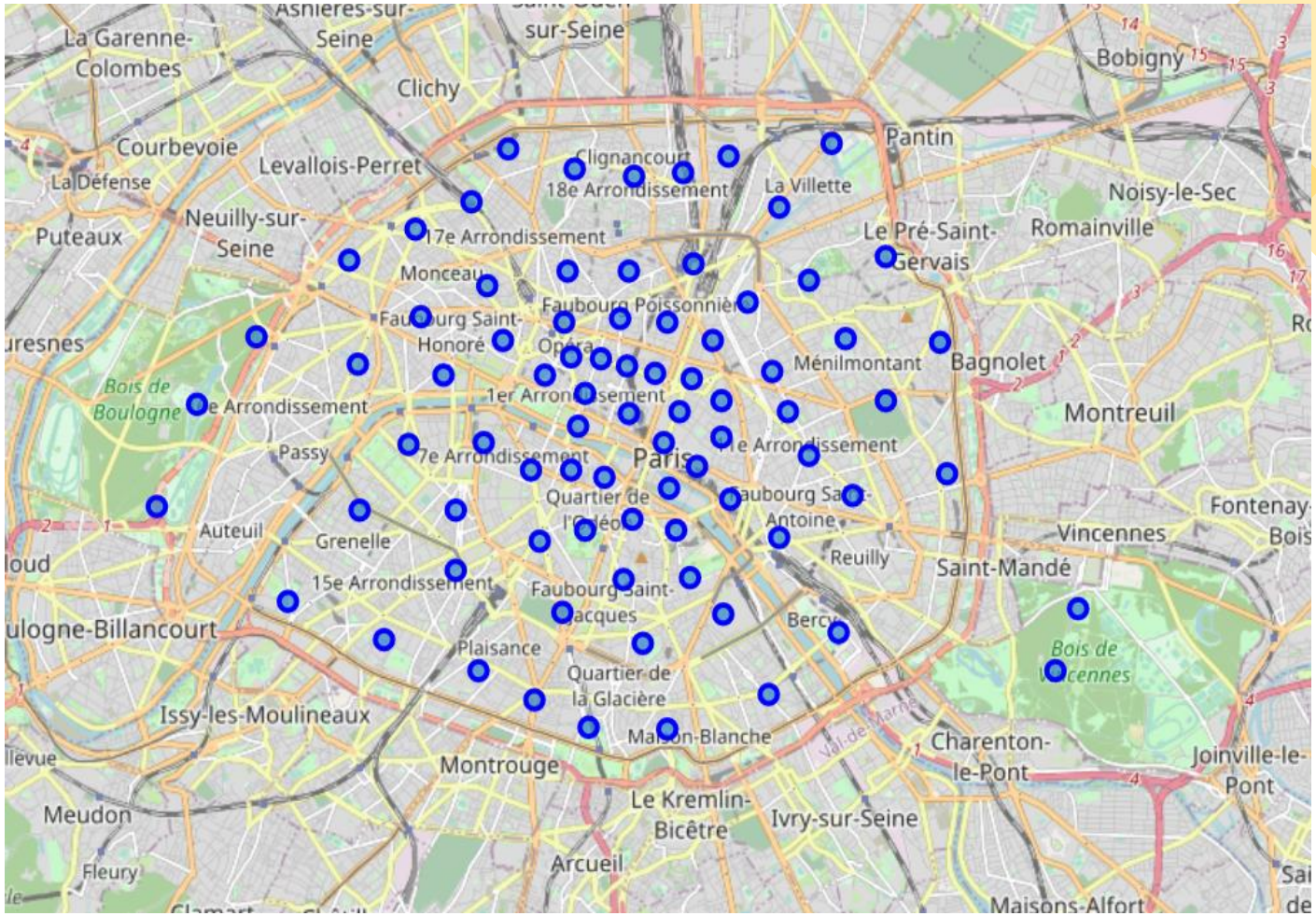
The analysis consists of 4 steps :

1. Collecting and understanding data of Paris neighborhoods
2. Exploring them using the foursquare API
3. Clustering them using K-means algorithm
4. Selecting potential neighborhoods considering population and rent data

DATA	SOURCE
List of Paris neighborhoods	Data.gouv.fr, french platform of public data
List of venues in each neighborhood	Foursquare API
Population size and characteristics for each neighborhood	Data.gouv.fr, french platform of public data
Rent data of each neighborhood	Data.gouv.fr, french platform of public data

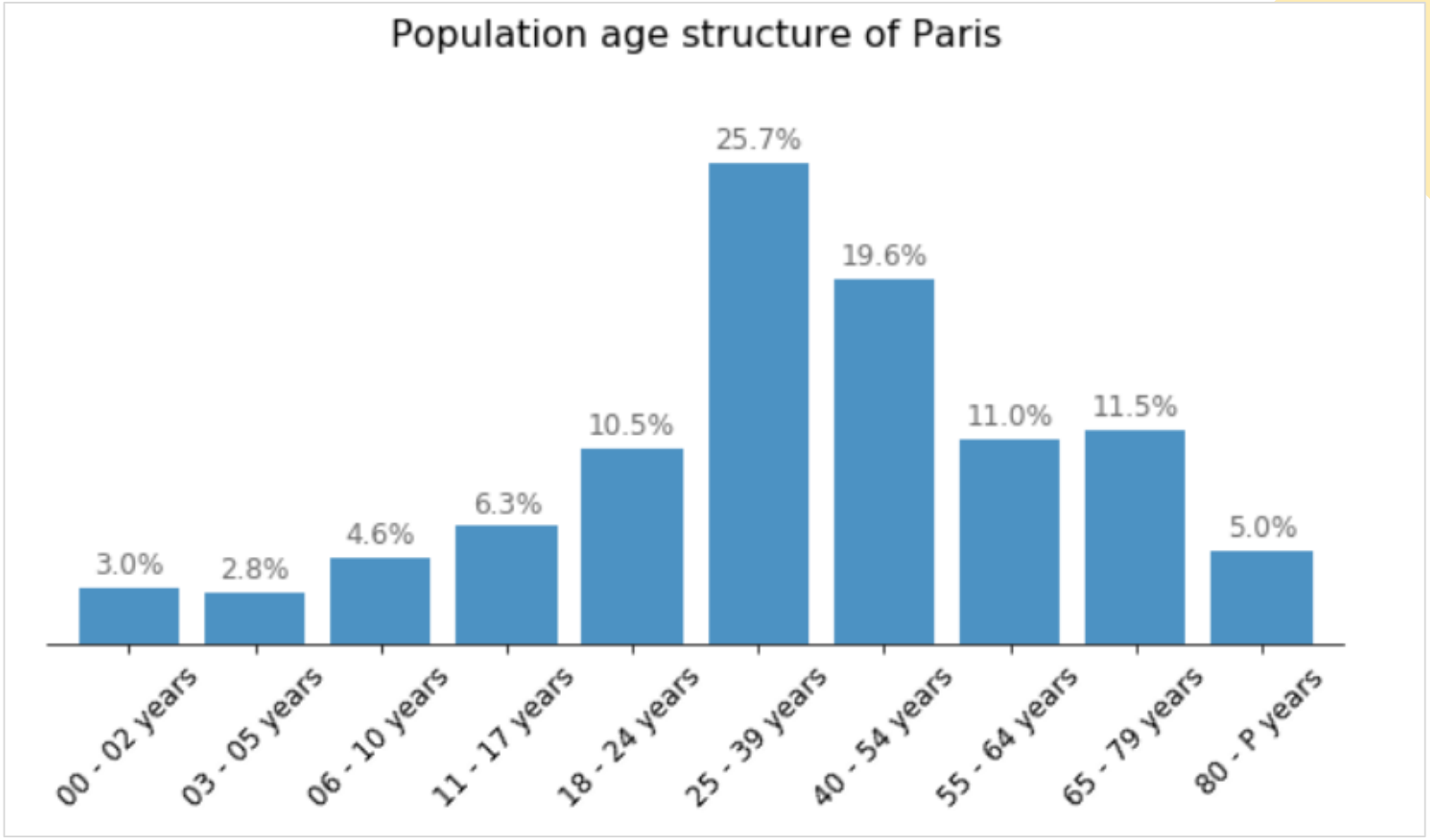
Neighborhoods visualization

The city of Paris is composed of 20 borough and 80 neighborhoods.



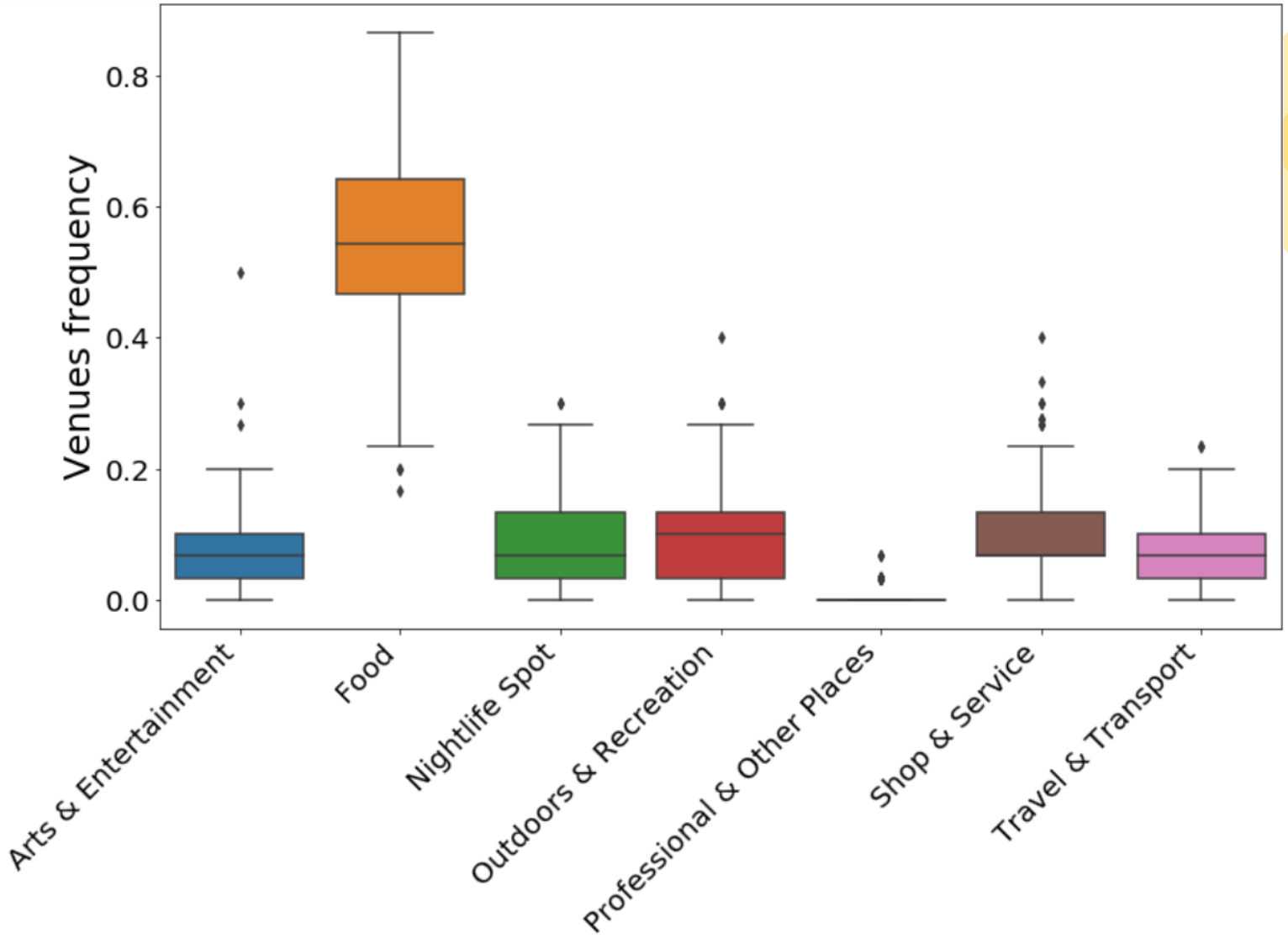
Population age structure

The city's population is young with the 25-39 years representing more than a quarter of the total population.



Neighborhoods exploration

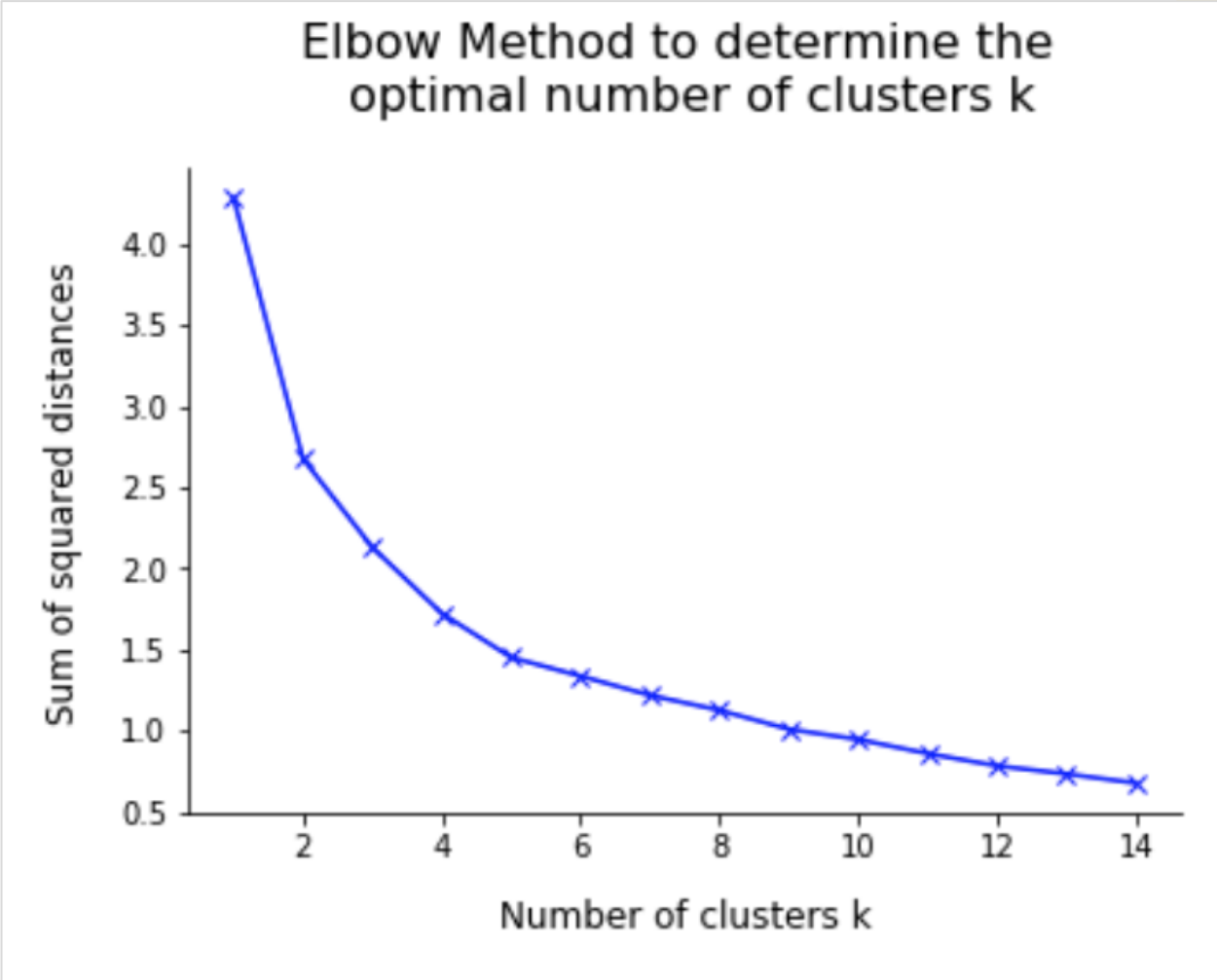
- Using the Foursquare API, we explored each one of the neighborhoods
- We can see that "Food" venues has a large place in Paris venues, as we could predict.



Selection of the number of clusters

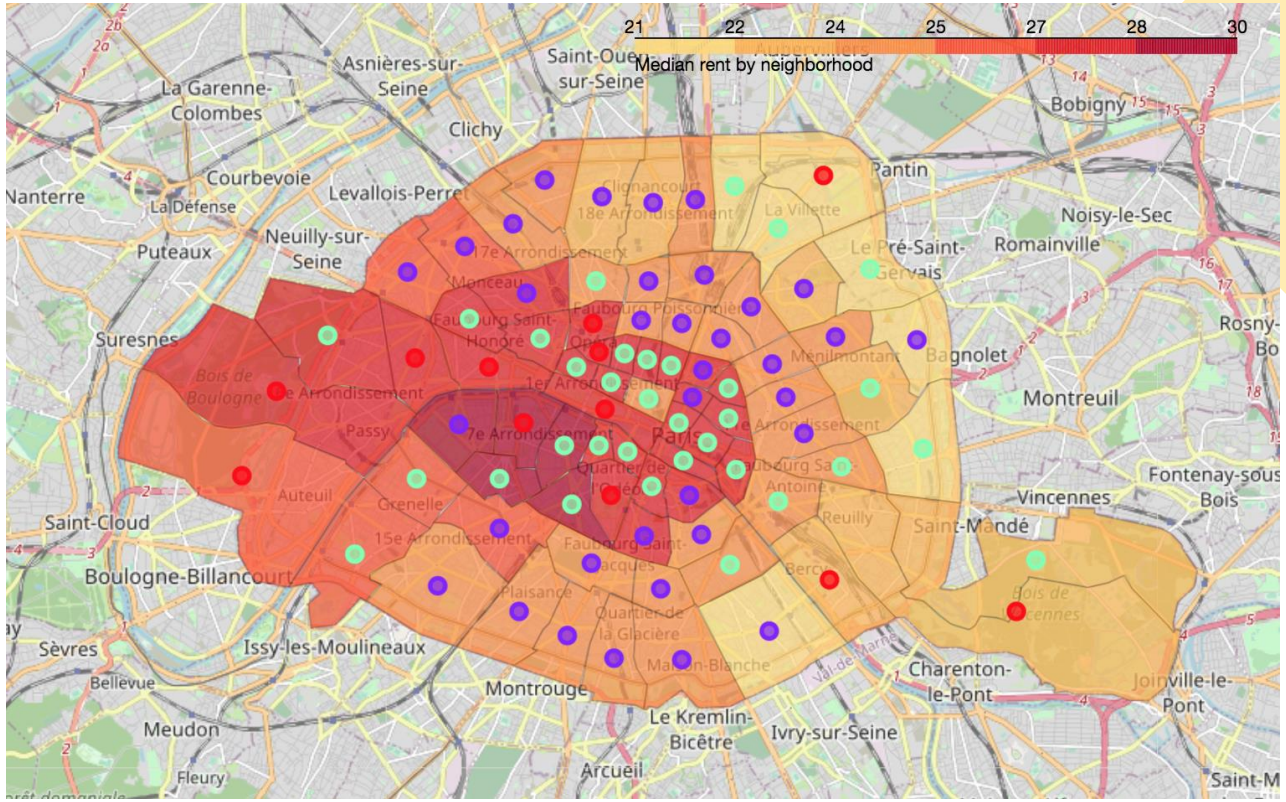
- Using the Elbow method, We can see that a suitable number of clusters would be between 3 and 5. After this value, the information gained by adding clusters is too marginal and will make our analysis too complex.

- We considered 3 clusters as we can understand and interpret them more easily.



Clusters visualization

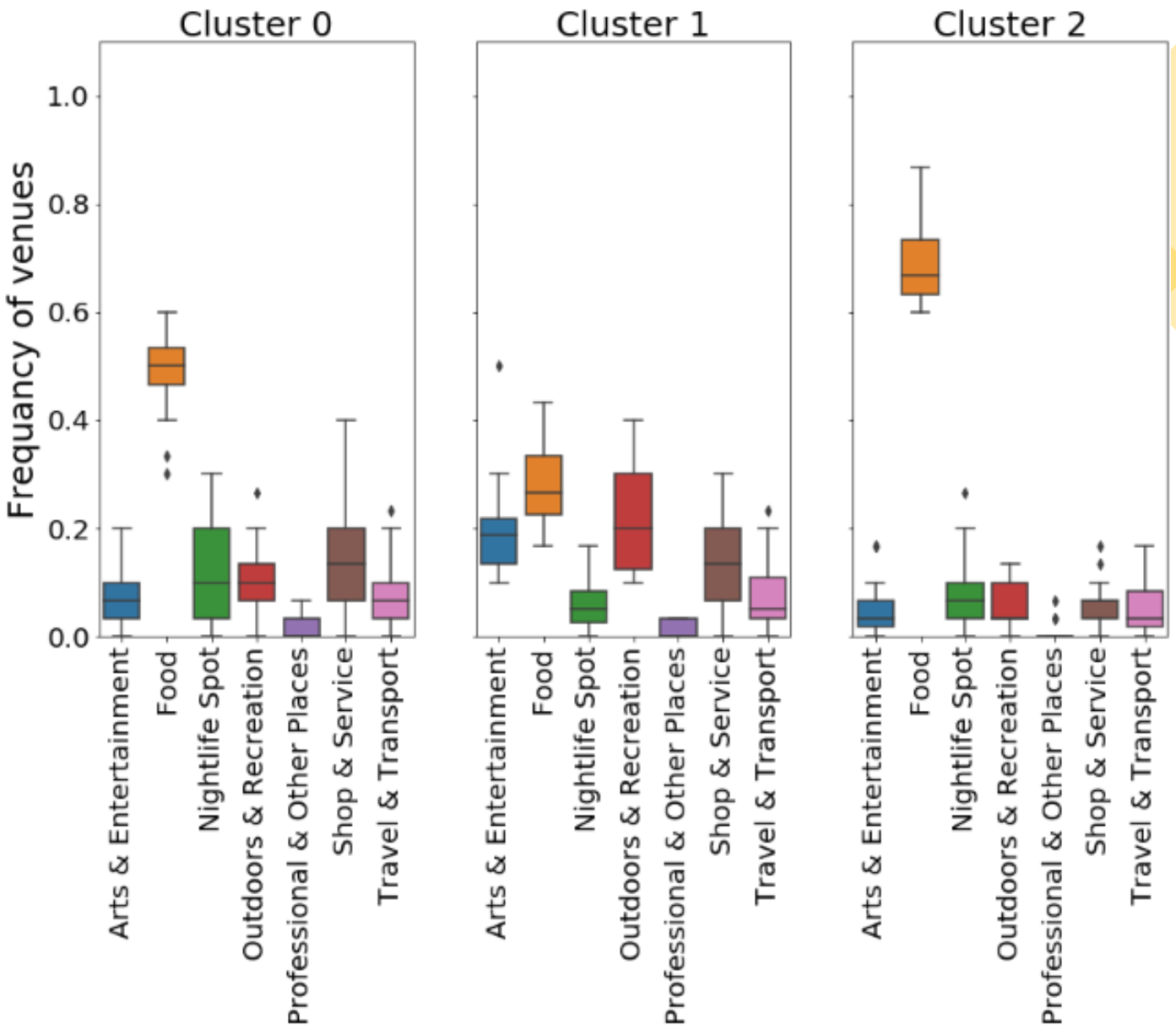
- Most of the neighborhoods of cluster 1 are located whether in high rent price area, whether in the extreme sides of the city.
- Neighborhoods of clusters 0 and 2 are more spread around the city.



Cluster 0 Cluster 1 Cluster 2

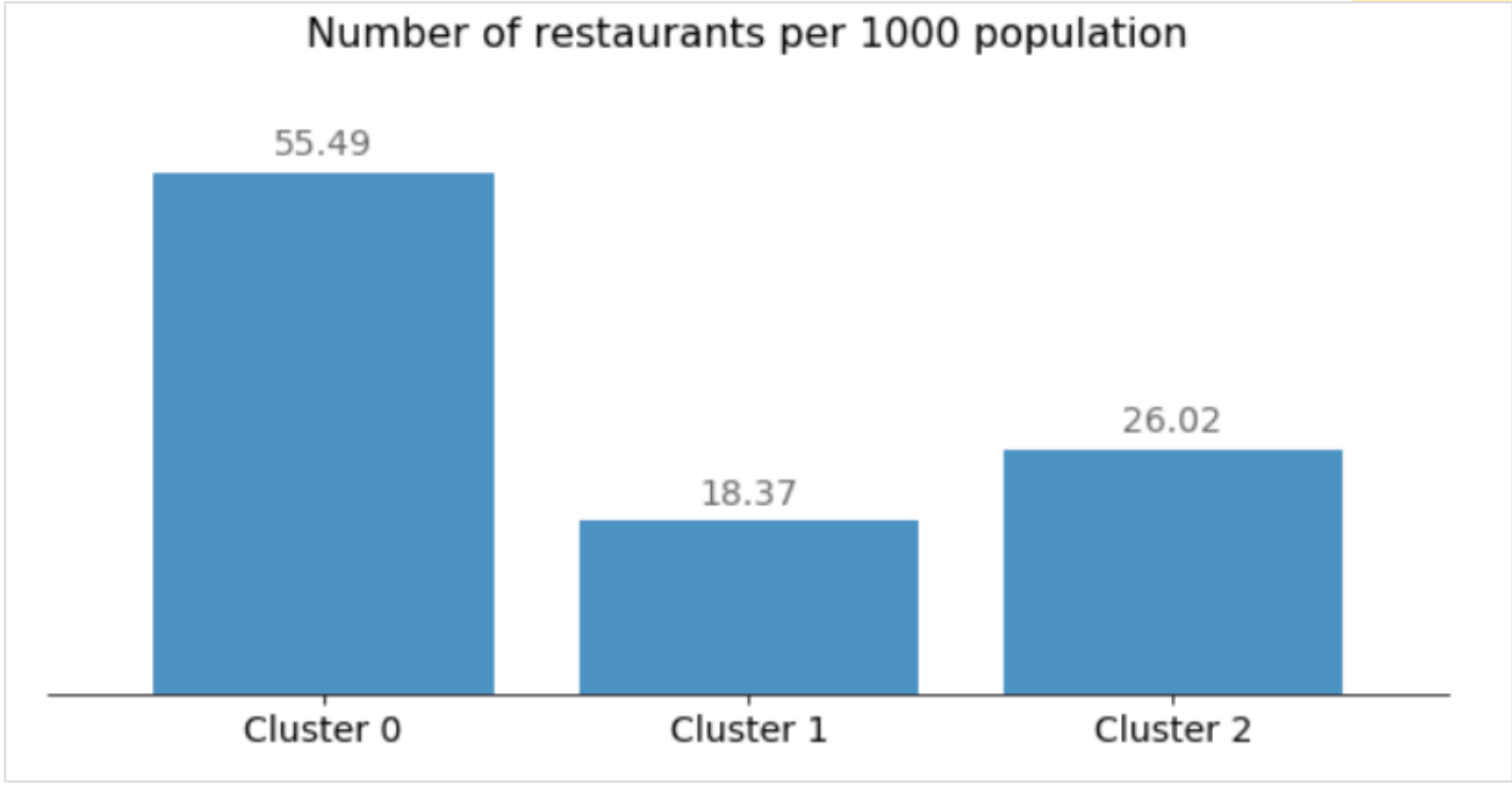
Clusters analysis

- Clusters 0 and 2 are dominated by "Food" venues, whereas the cluster 1 is more balanced. We can imagine that the neighborhoods of cluster 1 would be more like residential or cultural districts.
- For this reason, we will discard cluster 1 from our analysis as it does not seem to be suited to our business.



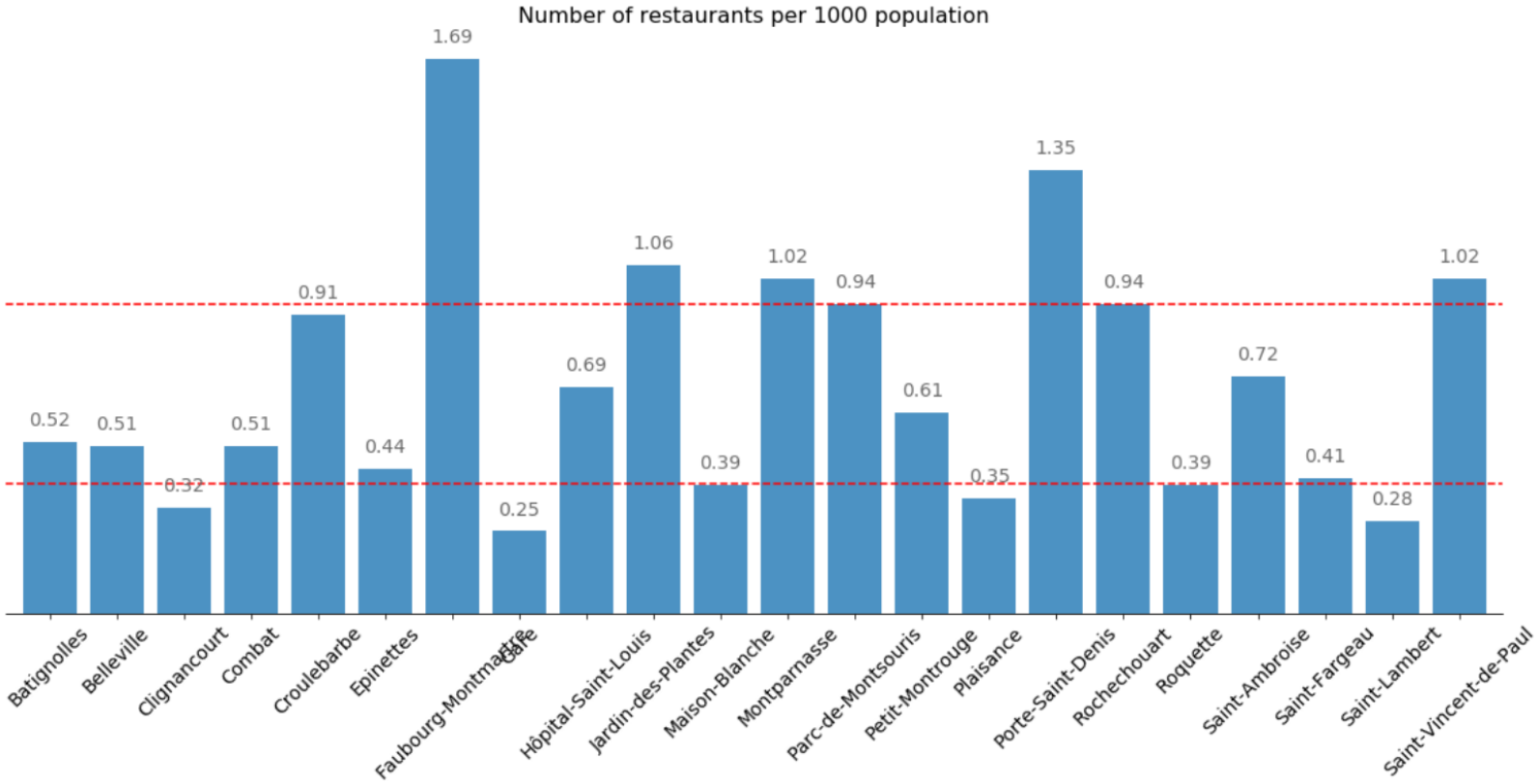
Clusters analysis

- Cluster 0 contains the largest number of restaurants per population. It would then be challenging to succeed in those neighborhoods considering the fierce competition we would face.
- The most secured option would then be neighborhoods in the cluster 2.



Customer base comparison

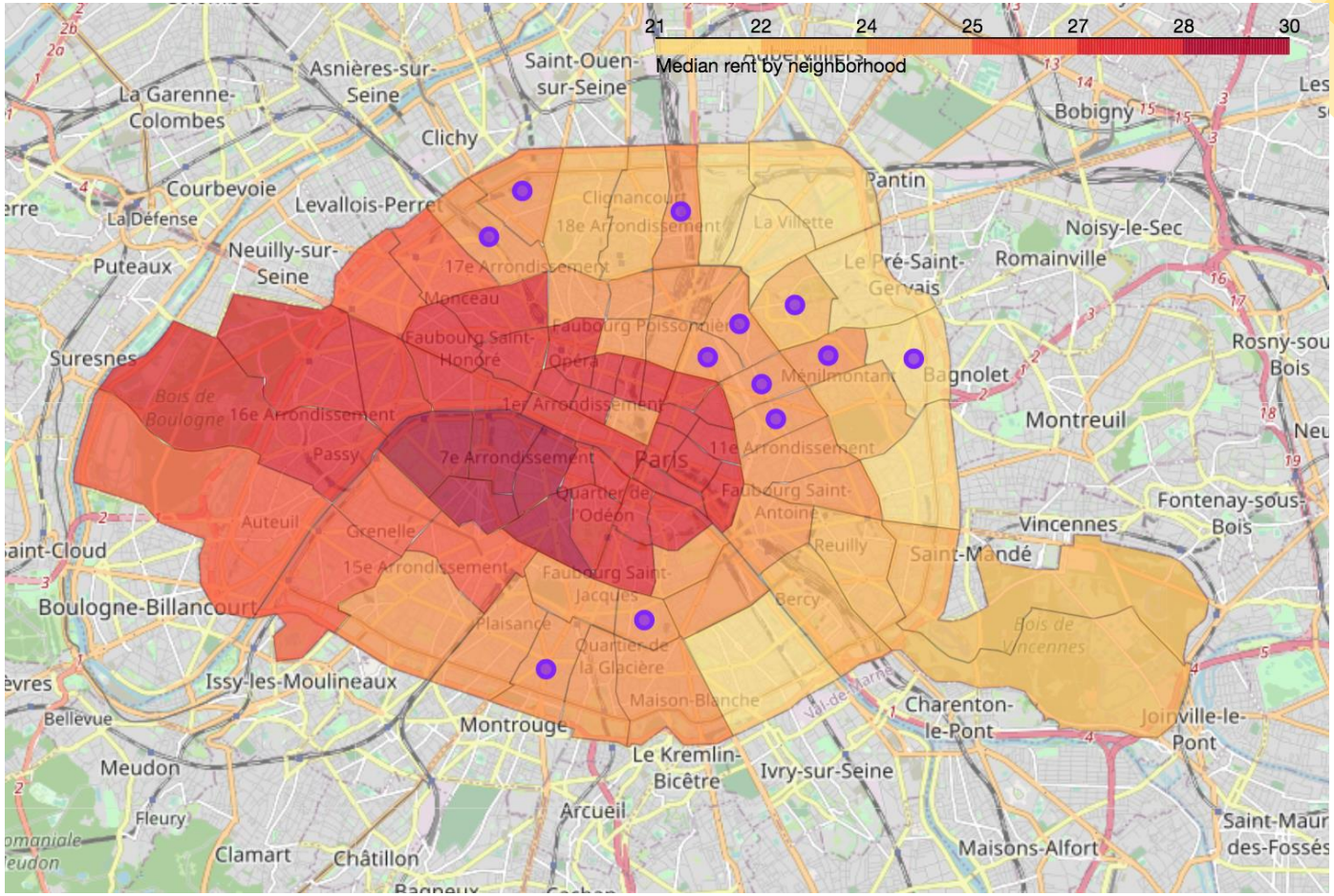
- By selecting neighborhoods of cluster 2 that are located in areas where the median rent price is below 25€ per m2, we could refine our list of potential neighborhoods.
- Our last analysis was to compare them with regards to the number of restaurants per population, in order to exclude outliners.



Clusters analysis

By keeping neighborhoods in which the number of restaurants lies between the 1st and 3rd quartile, we get our final list of 11 potential neighborhoods for opening a restaurant in Paris.

	Neighborhood
0	Batignolles
1	Belleville
2	Combat
3	Croulebarbe
4	Epinettes
5	Hôpital-Saint-Louis
6	Parc-de-Montsouris
7	Petit-Montrouge
8	Rochechouart
9	Saint-Ambroise
10	Saint-Fargeau



Conclusion

- Our analysis enabled us to select 11 neighborhoods (on a total of 80) that we consider to be the most suitable for opening a new restaurant in the city of Paris. This analysis has been conducted using different characteristics, such as the types of venues nearby, the population size and age, and the rent prices.

- This analysis is not perfect as it neglects considerations of pedestrian flow which are key for a restaurant success. Nonetheless it is a good starting point for an entrepreneur who is not familiar of the city or who want to have a more data driven recommendation.

Thank you