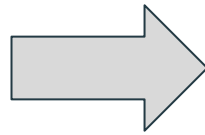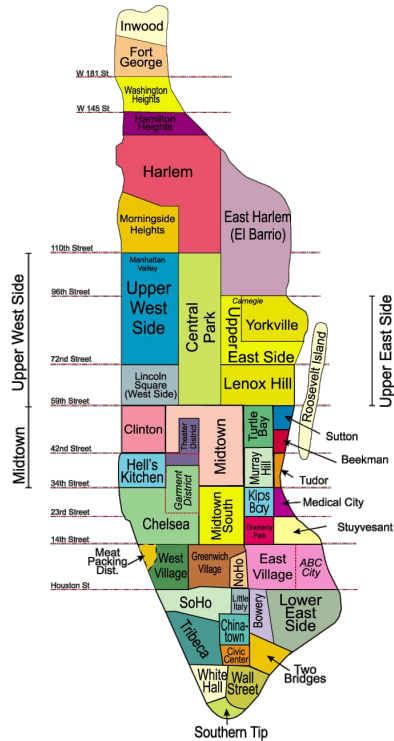# Battle of the Neighborhoods : move from Murray Hill to Paris

Guillaume RUE

SUMMARY

- Introduction
- Data
- Methodology
- Results
- Conclusion and future directions

INTRODUCTION

Goal : move from Murray Hill to Paris

DATA

- Data about Manhattan :

https://geo.nyu.edu/catalog/nyu_2451_34572

- Data about Paris boroughs :

https://www.data.gouv.fr/fr/datasets/r/e88c6fda-1d09-42a0-a069-606d3259114e
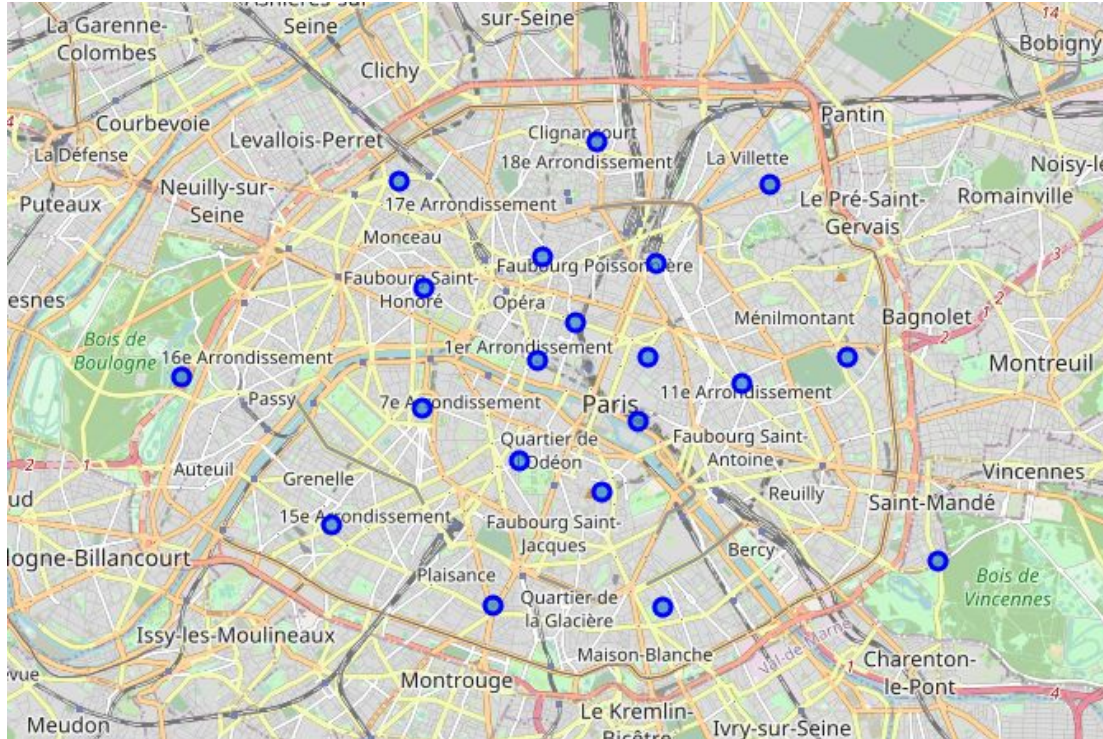
- Data about Paris neighborhoods :

https://opendata.paris.fr/explore/dataset/quartier_paris/download/?format=json&timezone=Europe/Berlin

- Data about all the venues is provided by the Foursquare API
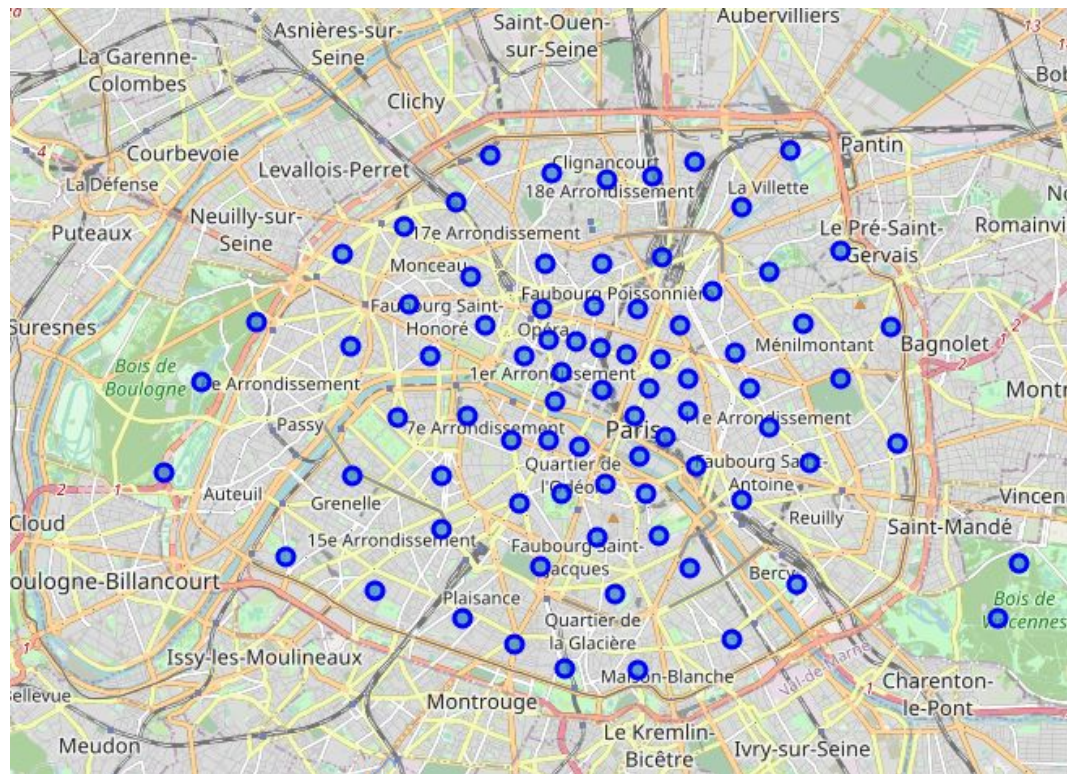
Paris Boroughs

- 20 boroughs

- Determined by a number from 1 to 20

Paris neighborhoods

- 80 neighborhoods

- 4 per borough

METHODOLOGY

- Examine Murray Hill
  - 97 venues
  - Most frequent venues :

```
----Murray Hill----
                  venue  freq
0           Coffee Shop  0.05
1        Sandwich Place  0.05
2                 Hotel  0.04
3   Japanese Restaurant  0.04
4           Pizza Place  0.03
```

- Some venues

	name	categories
0	Ippodo Tea Co.	Tea Room
1	Kajitsu	Japanese Restaurant
2	Sons of Thunder	Hawaiian Restaurant
3	Perk Kafe	Coffee Shop
4	The Renwick Hotel, Curio Collection by Hilton	Hotel

Exploration of Paris

- 298 uniques categories for the venues

- Creation of a dataframe with 10st most common venues for each neighborhood → one hot encoding

	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	10th Most Common Venue
0	Amérique	French Restaurant	Supermarket	Bistro	Health Food Store	Café	Bed & Breakfast	Tram Station	Park	Pool	Plaza

- Calculation of the most frequent venues

```
----Champs-Elysées----
               venue  freq
0    French Restaurant  0.15
1               Hotel  0.10
2            Boutique  0.08
3      Clothing Store  0.05
4  Japanese Restaurant  0.04
```

```
----Saint-Georges----
               venue  freq
0               Hotel  0.18
1    French Restaurant  0.13
2   Italian Restaurant  0.07
3        Cocktail Bar  0.07
4              Bistro  0.03
```
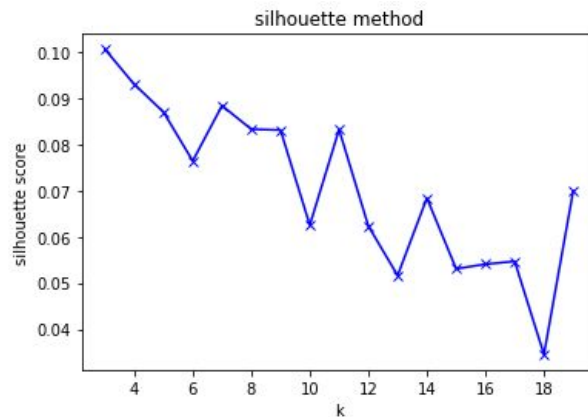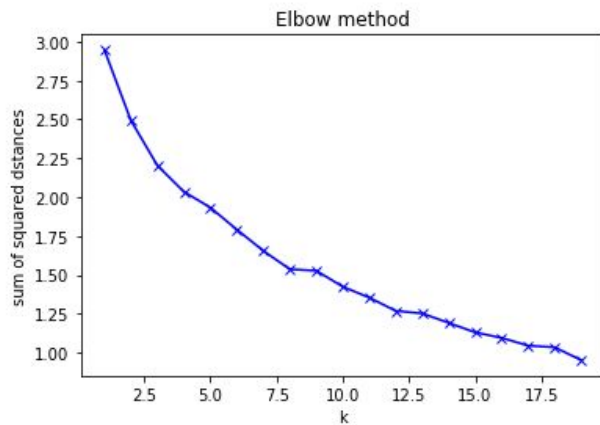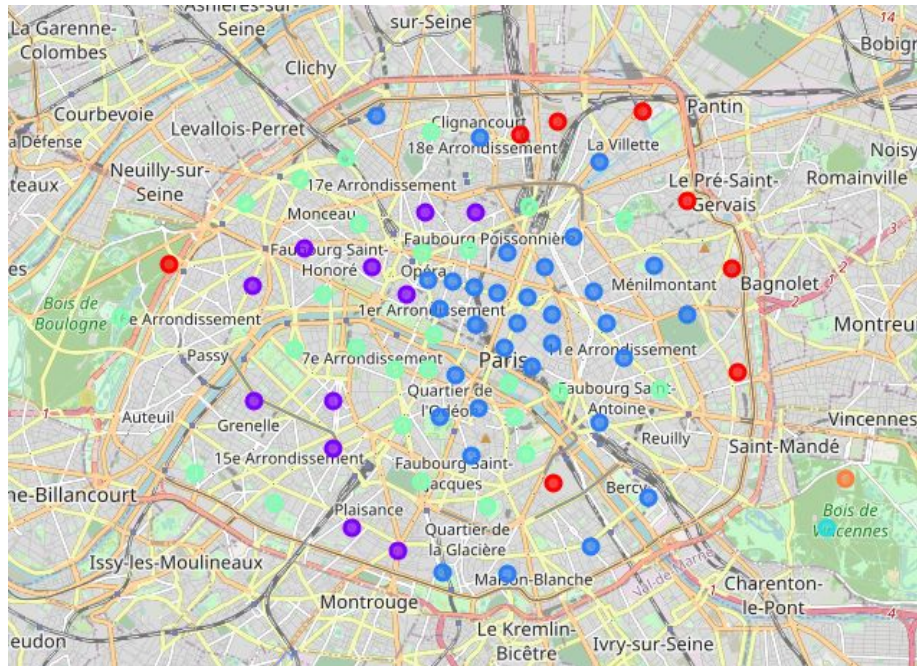
Creation of the model

- Unsupervised learning ⇒ clustering
- Which value of k?

⇒ k = 7

RESULTS

	num_neighborhood	Cluster Labels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue
0	2.0	2	French Restaurant	Coffee Shop	Ice Cream Shop	Bakery	Chinese Restaurant
1	3.0	2	Japanese Restaurant	French Restaurant	Hotel	Coffee Shop	Plaza
2	5.0	2	Japanese Restaurant	Hotel	French Restaurant	Wine Bar	Jewelry Store
3	6.0	2	Japanese Restaurant	French Restaurant	Wine Bar	Hotel	Bistro
4	7.0	2	French Restaurant	Cocktail Bar	Wine Bar	Bakery	Coffee Shop
5	8.0	2	French Restaurant	Cocktail Bar	Hotel	Bakery	Coffee Shop
6	9.0	2	French Restaurant	Hotel	Italian Restaurant	Bar	Chinese Restaurant
7	10.0	2	French Restaurant	Hotel	Japanese Restaurant	Italian Restaurant	Wine Bar
8	11.0	2	French Restaurant	Hotel	Italian Restaurant	Japanese Restaurant	Coffee Shop
9	12.0	2	French Restaurant	Art Gallery	Hotel	Café	Chinese Restaurant

Examples of neighborhoods in blue cluster

CONCLUSION AND FUTURE DISCUSSIONS

- Cluster with blue circle is similar to Murray Hill
- We found similar venues

Some ideas for the future :

- Use house prices
- Population demography
- Proximity of public transport