

# Compare the Neighborhoods in Different Cities

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## 1. Introduction

### 1.1 Background

Pierre is born in Paris and he has lived there for more than decades. Recently, the company he works for sends him to London, where a city is not very far from Paris but the distance is big enough to make the 2 cities varies a lot from each other.

To pursue a better career or maybe deeply inside Pierre's heart that he wants to break the usual live method he has right now, he takes the chance.

The mission will be 3 years so Pierre has to rent a studio or an apartment in London for the next 3 years.

### 1.2 Problem

Pierre has never gone to London before nor his friends. He has been lived in Paris ever since his birth and he has an apartment in rue de Lourmel, 75015 Paris. He loves the current neighborhood and wants to rent a place in a similar neighborhood in London too.

This project aims at helping Pierre to find a similar neighborhood in London so he can mingle in the new environment easily.

### 1.3 Interest

Property rental company would be interested in this kind of project. If customers can provide their current home address or the neighborhood name that they like in the current city or other city, the agent can recommend more suitable places to them.

On the contrary, if customers tell you that a specific neighborhood that they don't like, the rental company can prevent to recommend the similar neighborhood to them.

## 2. Data Acquisition and Cleaning

### 2.1 Data Sources

**Paris data**

According to Pierre's address, I get his address postcode – 75015. I went to the following link to get France postcode and longitude/latitude.

[https://datanova.legroupe.laposte.fr/explore/dataset/laposte\\_hexasmal/information/?disjunctive.code\\_commune\\_insee&disjunctive.nom\\_de\\_la\\_commune&disjunctive.code\\_postal&disjunctive.ligne\\_5](https://datanova.legroupe.laposte.fr/explore/dataset/laposte_hexasmal/information/?disjunctive.code_commune_insee&disjunctive.nom_de_la_commune&disjunctive.code_postal&disjunctive.ligne_5)

### London data

On WIKI, there are a list of London neighborhood with longitude/latitude.

[https://en.wikipedia.org/wiki/List\\_of\\_London\\_boroughs](https://en.wikipedia.org/wiki/List_of_London_boroughs)

### Neighborhood stores data

I use the Foursquare API to get the data I need.

## 2.2 Data Cleaning

The dataset get from web has some problems. I only need neighborhood name and the respective longitude/latitude.

So from Paris data, I deleted those data outside Paris and deleted all the columns except 'Nom\_commune' (the name of each district)/'longitude'/'latitude'. To have a consistency of the two datasets, the neighborhood name is changed to 'Neighborhood'.

From London data, the data is refined to 'Neighborhood'/'longitude'/'latitude'.

Finally, I combined the 2 datasets and rename them to df1.

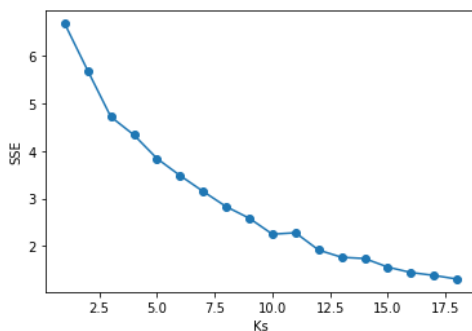
Aside from these, the dataset that I get from Foursquare API. I grouped them by 'Neighborhood' and get dummies of each store.

## 3. Data Analysis

### 3.1 Build the model

For the reason that it is an unsupervised training, I plan to use K-means to cluster the different neighborhood and see if we can get 2 or more similar neighborhoods both in Paris and London.

Define K number



The turning point is 10.

Build up the classifier with k=10.

### 3.2 Result

Pierre lives in 75015 = PARIS 15. The same classified results are

	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	PARIS 02	French Restaurant	Bakery	Salad Place	Bar	Wine Bar	Gym	Coffee Shop	Cocktail Bar	Sandwich Place	Bistro
2	PARIS 08	French Restaurant	Hotel	Salad Place	Bar	Italian Restaurant	Japanese Restaurant	Bakery	Creperie	Café	Middle Eastern Restaurant
3	PARIS 14	Hotel	Bistro	Bakery	Fast Food Restaurant	French Restaurant	Pizza Place	Italian Restaurant	Food & Drink Shop	Gaming Cafe	Furniture / Home Store
5	PARIS 17	Hotel	French Restaurant	Bakery	Italian Restaurant	Bus Stop	Plaza	Escape Room	Food Court	Café	Grocery Store
6	PARIS 19	Bar	African Restaurant	Supermarket	Japanese Restaurant	Italian Restaurant	French Restaurant	Concert Hall	Spa	Burger Joint	Bakery
7	PARIS 06	Hotel	Café	French Restaurant	Bakery	Chocolate Shop	Pastry Shop	Playground	Boutique	Sandwich Place	Supermarket
9	PARIS 13	French Restaurant	Stadium	Trail	Soccer Field	Chinese Restaurant	Park	Escape Room	Ethiopian Restaurant	Gastropub	Garden
10	PARIS 18	Bar	French Restaurant	Theater	Italian Restaurant	Gastropub	Supermarket	Mediterranean Restaurant	Gym	Middle Eastern Restaurant	Café
11	PARIS 01	Plaza	Coffee Shop	Italian Restaurant	Historic Site	Café	Bar	Art Museum	Garden	Hotel	Furniture / Home Store
12	PARIS 05	French Restaurant	Bar	Hotel	Creperie	Bakery	Sushi Restaurant	Plaza	Lebanese Restaurant	Chinese Restaurant	Ice Cream Shop
13	PARIS 09	French Restaurant	Bistro	Bakery	Hotel	Wine Bar	Bar	Gym / Fitness Center	Japanese Restaurant	Brazilian Restaurant	Burger Joint
14	PARIS 10	French Restaurant	Bistro	Coffee Shop	Cosmetics Shop	Hotel	Asian Restaurant	Café	Sandwich Place	Burger Joint	Beer Garden
16	PARIS 04	French Restaurant	Ice Cream Shop	Italian Restaurant	Hotel	Creperie	Thai Restaurant	Restaurant	Candy Store	Bakery	Hostel
17	PARIS 07	French Restaurant	Plaza	Hotel	History Museum	Café	Historic Site	Garden	Art Museum	Park	Shop & Service
18	PARIS 11	French Restaurant	Hotel	Bar	Café	Italian Restaurant	Sandwich Place	Vietnamese Restaurant	Wine Bar	Restaurant	Japanese Restaurant
19	PARIS 15	Indian Restaurant	Hotel	Italian Restaurant	Bakery	Gym	French Restaurant	Food & Drink Shop	Food Court	Fountain	Frozen Yogurt Shop
21	PARIS 20	Bakery	French Restaurant	Bistro	Food & Drink Shop	Pharmacy	Health Food Store	Plaza	Restaurant	Bookstore	Market
27	Camden	Hotel	Coffee Shop	Italian Restaurant	Gift Shop	Bar	Café	Chocolate Shop	Breakfast Spot	Sandwich Place	Sushi Restaurant
45	Newham	Light Rail Station	Donut Shop	Hotel	Airport Terminal	Gift Shop	German Restaurant	Gastropub	Garden	Food & Drink Shop	Gaming Cafe
53	Westminster	Hotel	Coffee Shop	Sushi Restaurant	Juice Bar	Sandwich Place	Sporting Goods Shop	Street Food Gathering	Tapas Restaurant	Breakfast Spot	Restaurant

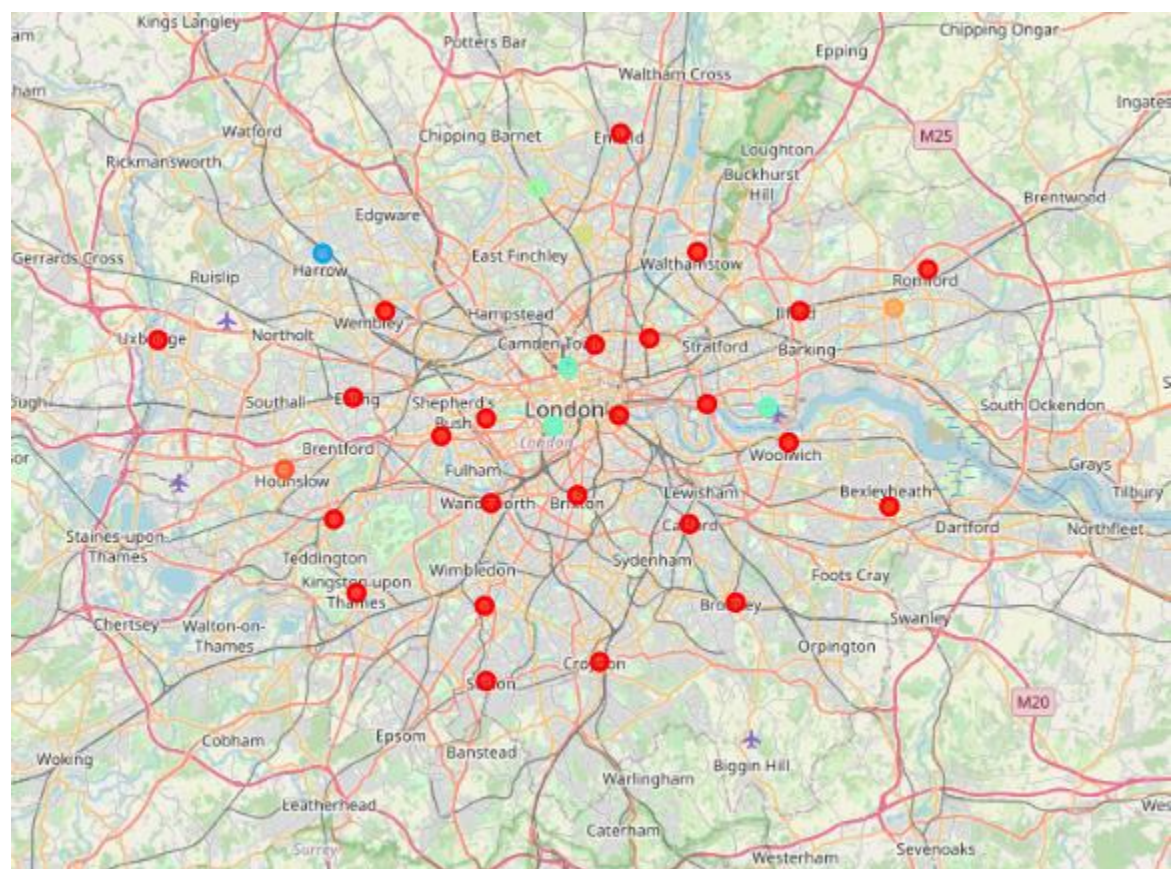
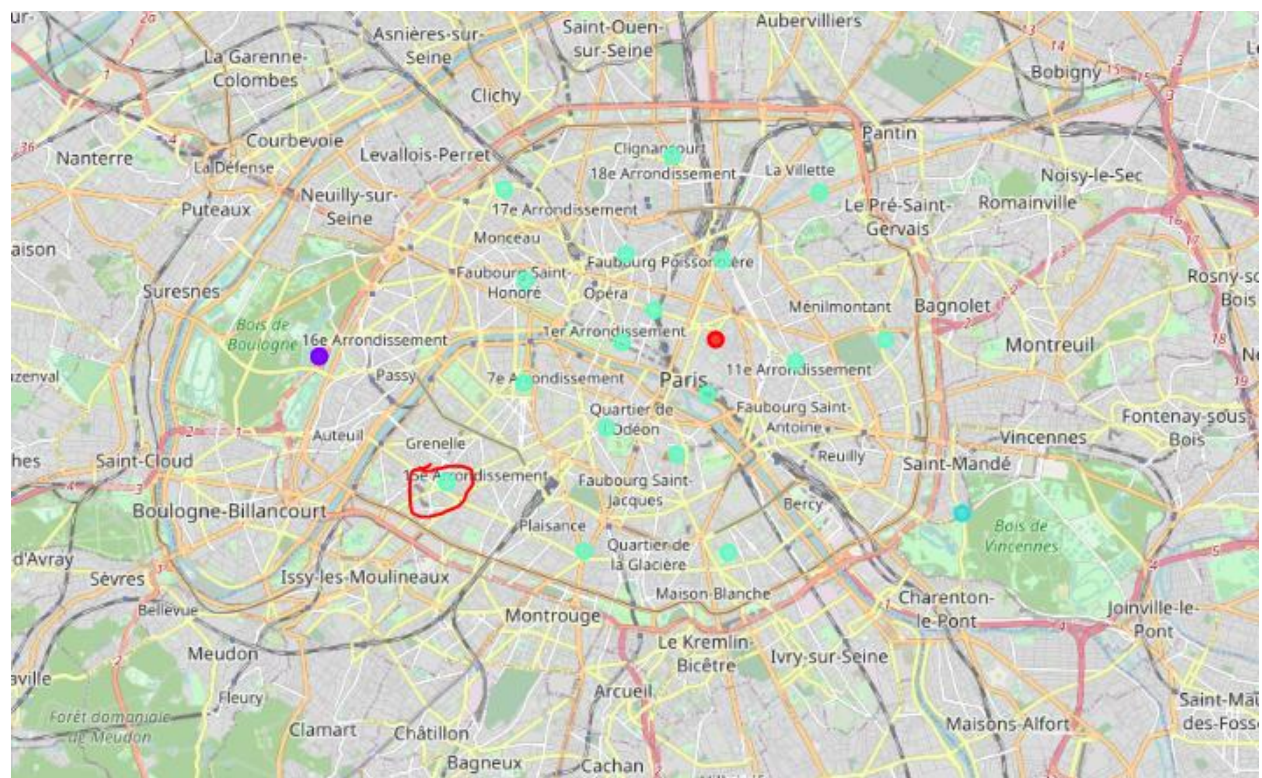
Which means in London, Camden/Newham/Westminster are similar district.

### 3.3 Visualization

I used Folium to create the visualization. First to show Paris neighborhood with classified results. Then on the same map (scroll small and find London) there are London neighborhood with classified results.

The light Blue (in red circle in the Paris map) is the district where Pierre lives.





## 4. Conclusion

If Pierre wants to live in a similar district in London, he can choose Camden/Newham/Westminster.