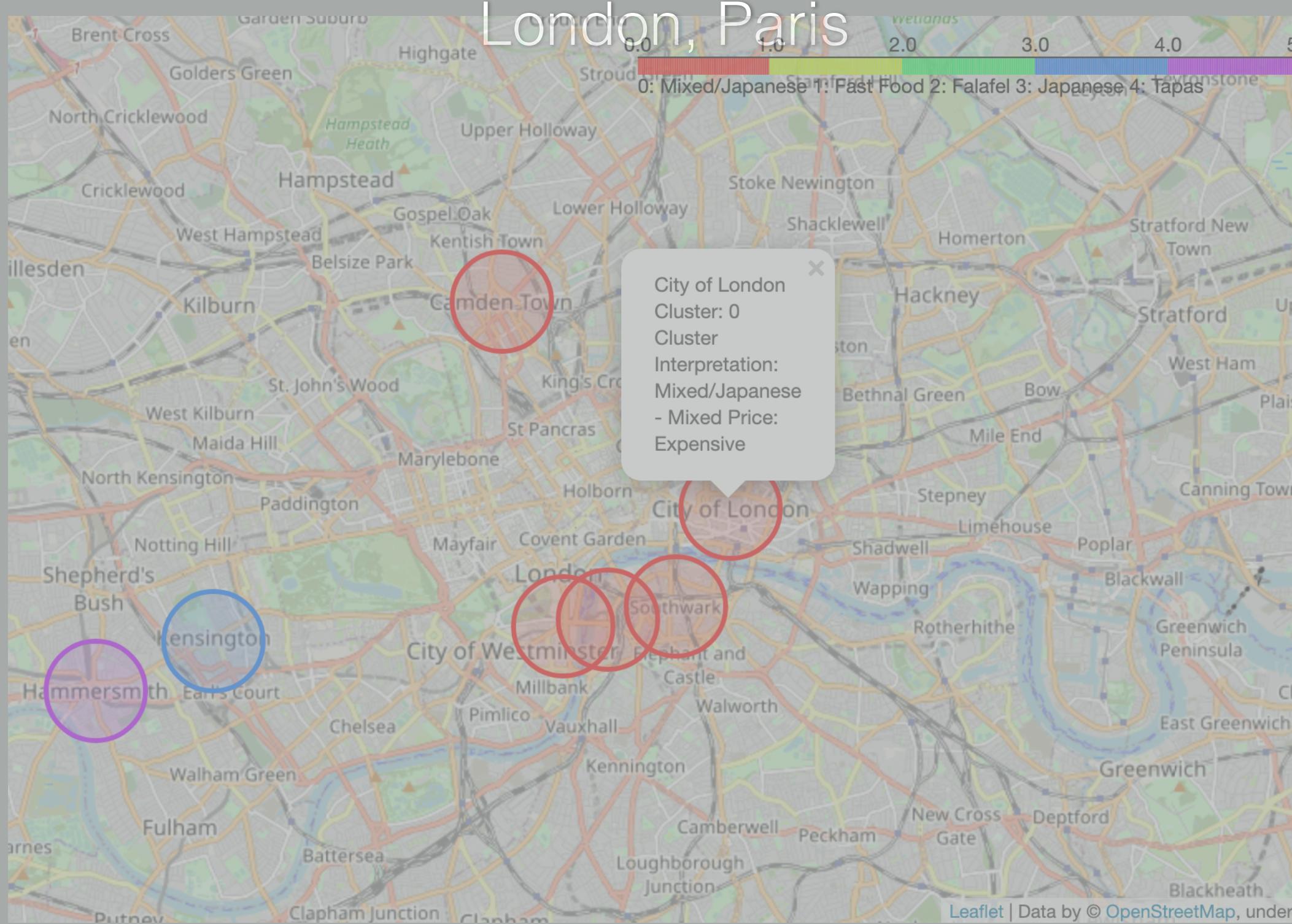


Coursera Capstone Project

M. Jaschkowitz - 18.02.2021



Business Problem

- As a new Japanese franchise company needs recommendations for their set up with three new high-priced sushi and Japanese food restaurants, they came up with the question which places over the cities of Berlin, Paris and London would be the best to locate their restaurants.
- In order to give them the best recommendation for the new locations in every city, the first question to be answered is: What is the right quarter for a high-priced Japanese restaurant?
- Therefore it is necessary to formulate the criteria for the right location.

Criteria and assumptions for the business problem:

1. As the restaurant will be high-priced, it should be located in quarters with other high-priced restaurants to set up the new location.

2. Even if competition stimulates business, it is much more likely that a new restaurant will get the most customers if there is less choice or less competitors in the same business area. Therefore, we search for quarters in these cities which are not already dominated by Japanese Food.

These criteria yields to the following questions:

1. Find locations where high-priced restaurants are accepted
 2. Find locations which are not dominated by Japanese like restaurants
 3. Maximize the profitability of the new franchise restaurants by searching the best location.
- The questions can be solved by crawling social network informations. We search for differences and similarities between the neighborhoods of the cities, based on the above-described criteria.

Data acquisition

- The neighborhoods and post codes of Berlin: <https://www.plz-suche.org/stadt.berlin-de13f3>
- Neighborhoods and postal codes of Paris: <https://www.annuaire-administration.com/code-postal/departement/paris.html3>
- Neighborhoods and postal codes of London: <https://data.london.gov.uk/dataset/london-borough-profiles#:~:text=The%20London%20boroughs%20are%3A%20City,%2C%20Lewisham%2C%20Merton%2C%20Newham%2C>
- The geocoordinates of the cities: <https://geopy.readthedocs.io/en/stable/>
- Restaurants and price categories: <https://de.foursquare.com/city-guide>

Data Cleaning

Neighborhoods:

- Berlin : 96
double : 6
Cleaned data: 90
- Paris : 20
- London : 30

Paris and London had no missing values or doubled datasets.

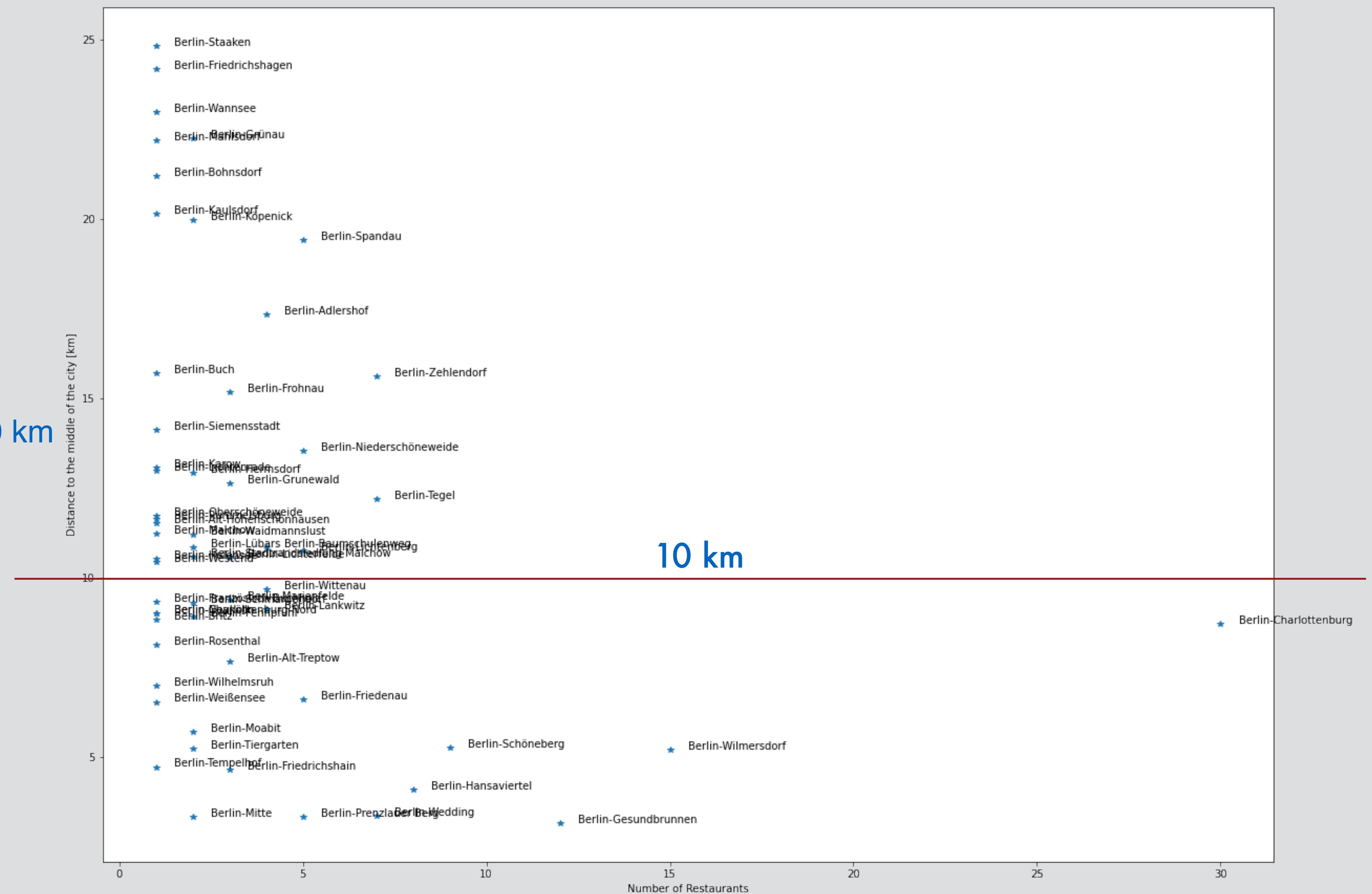
Venues:

- Berlin
venues : 1077
venue categories : 227
Cleaned restaurant -venues : 113
- Paris : 1440
venue categories : 222
Cleaned restaurant-venues : 169
- London : 1324
venue categories : 229
Cleaned restaurant-venues : 136

The data were searched for the venue category ,restaurants'. Overall the venues were condensed from 3841 to 418 single venues.

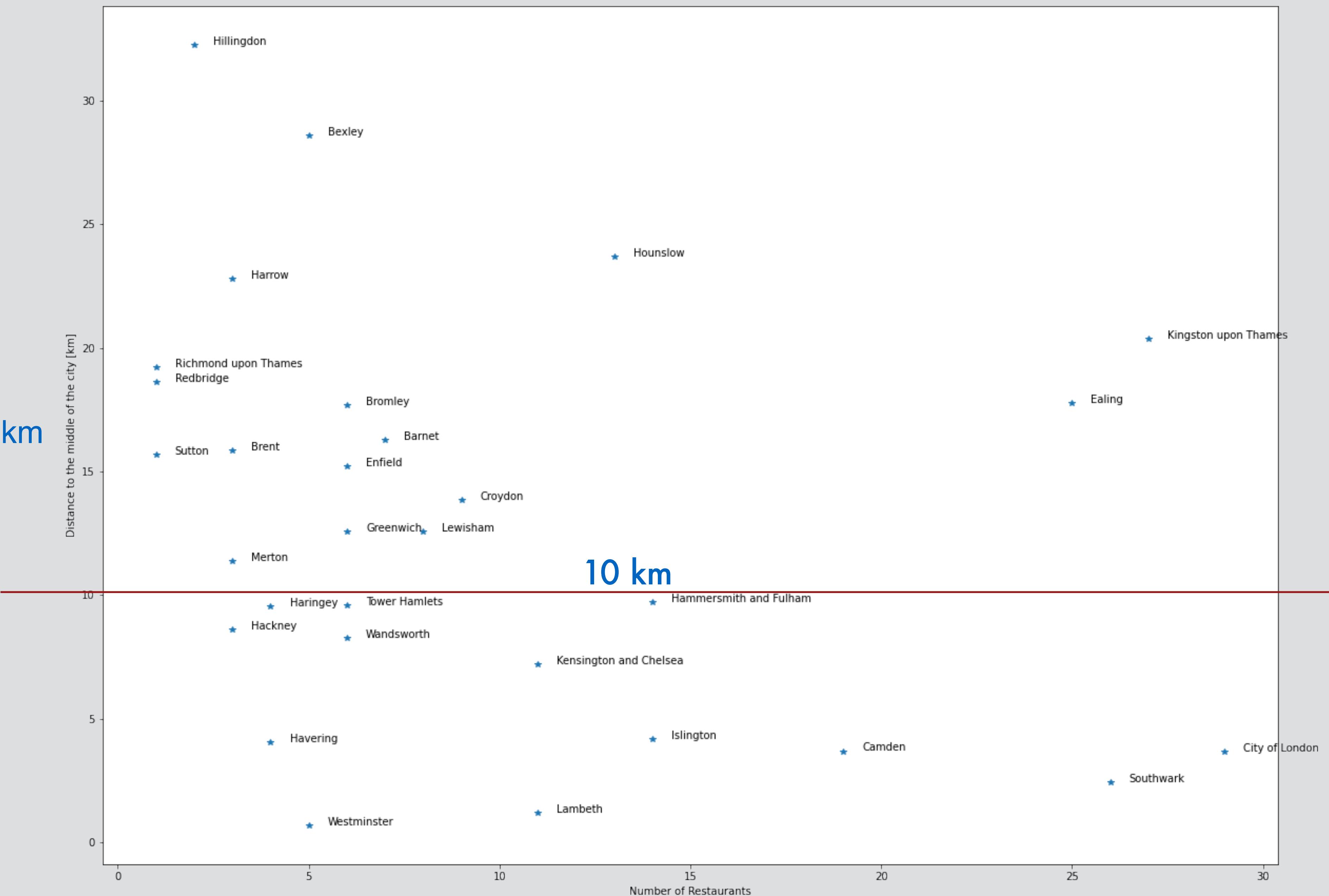
- Based on the quantity of restaurants in some neighborhoods, I chose a radius around the inner circle of every city to determine a limit of neighborhoods which is not relevant for the search-process

Berlin:
The neighborhoods with the
most restaurants are in a 10 km
radius around the inner city



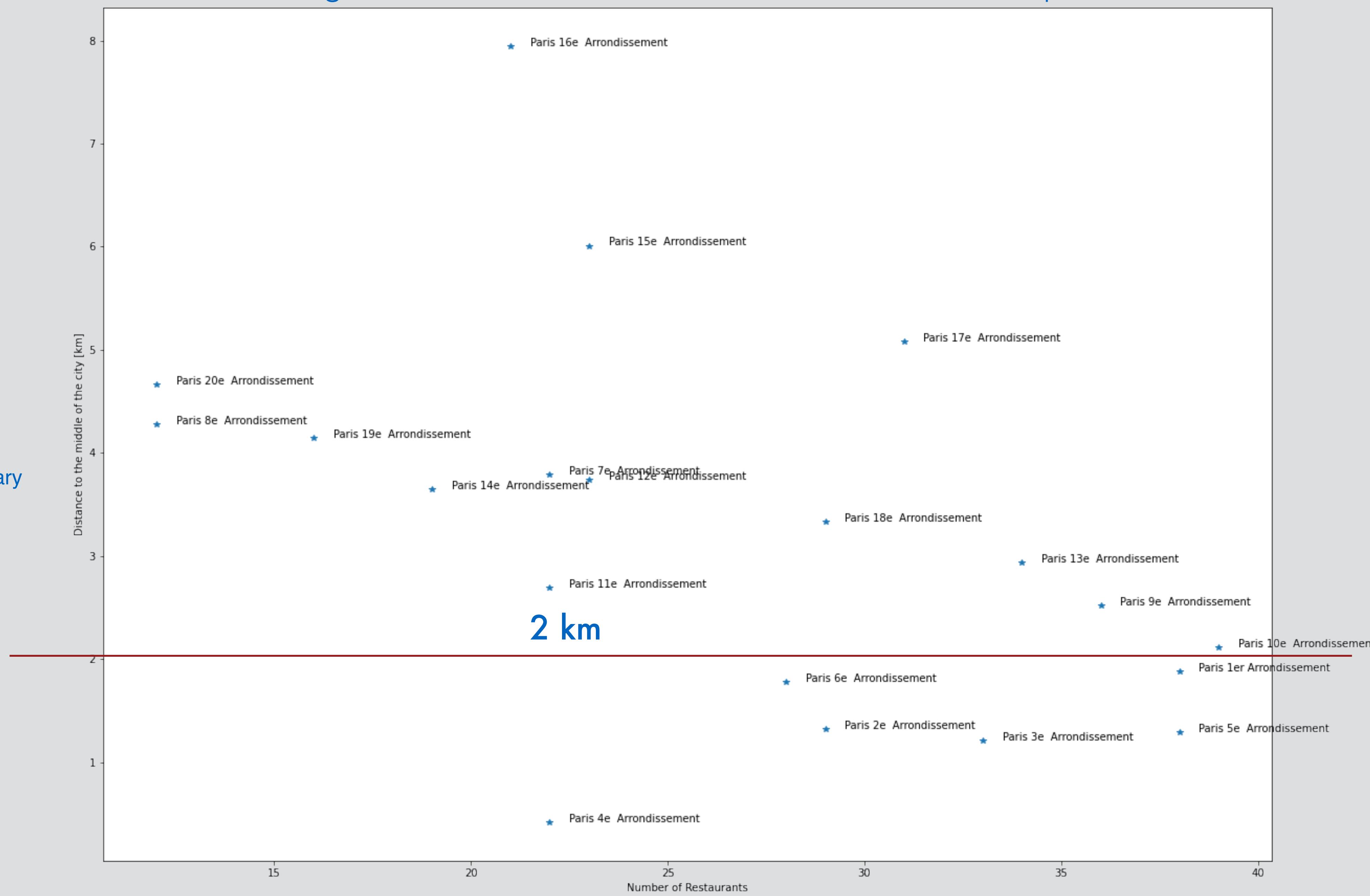
- Based on the quantity of restaurants in some neighborhoods, I chose a radius around the inner circle of every city to determine a limit of neighborhoods which is not relevant for the search-process

London:
The neighborhoods with the
most restaurants are in a 10 km
radius around the inner city



- Based on the quantity of restaurants in some neighborhoods, I chose a radius around the inner circle of every city to determine a limit of neighborhoods which is not relevant for the search-process

London:
 The neighborhoods with the
 most restaurants are in a 2 km
 radius around the inner city.
 There are as well a lot of restaurants
 in a wider range, but due to the limit
 of queries at foursquare.com, it is necessary
 to cut some restaurants.



Clustering process and results

Number of clusters
in every city:

Berlin : 6

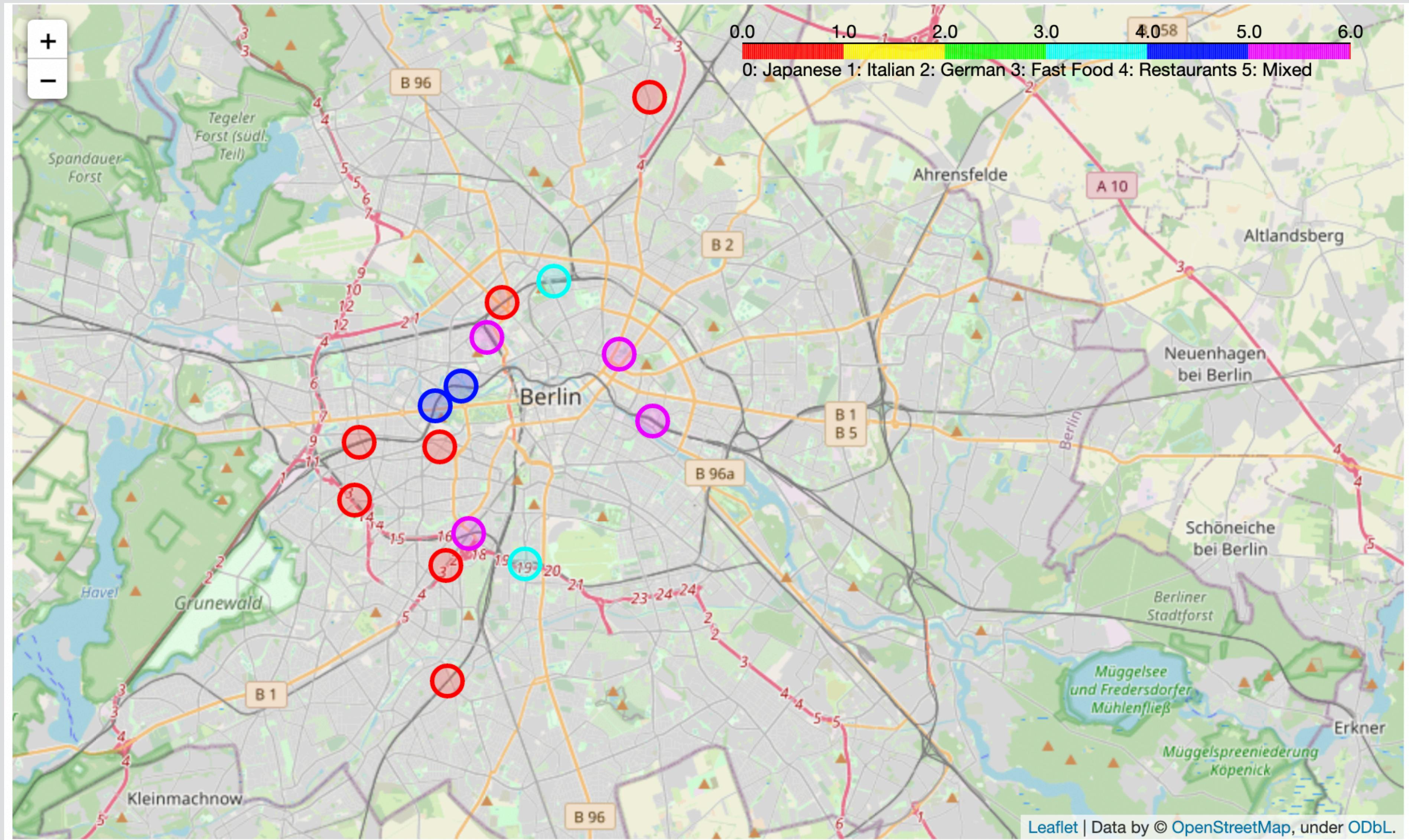
Paris : 4

London : 5

City	Cluster 0	Cluster 1	Cluster 2	Cluster 3	Cluster 4	Cluster 5
Berlin	Japanese	Italian	German	Fast Food	Unspecified Restaurants	Mixed Restaurants
Paris	French	Japanese	Mexican	Falafel		
London	Mixed / Japanese	Fast Food	Falafel	Japanese	Tapas	

Resulting maps - Berlin Cheap Price Category

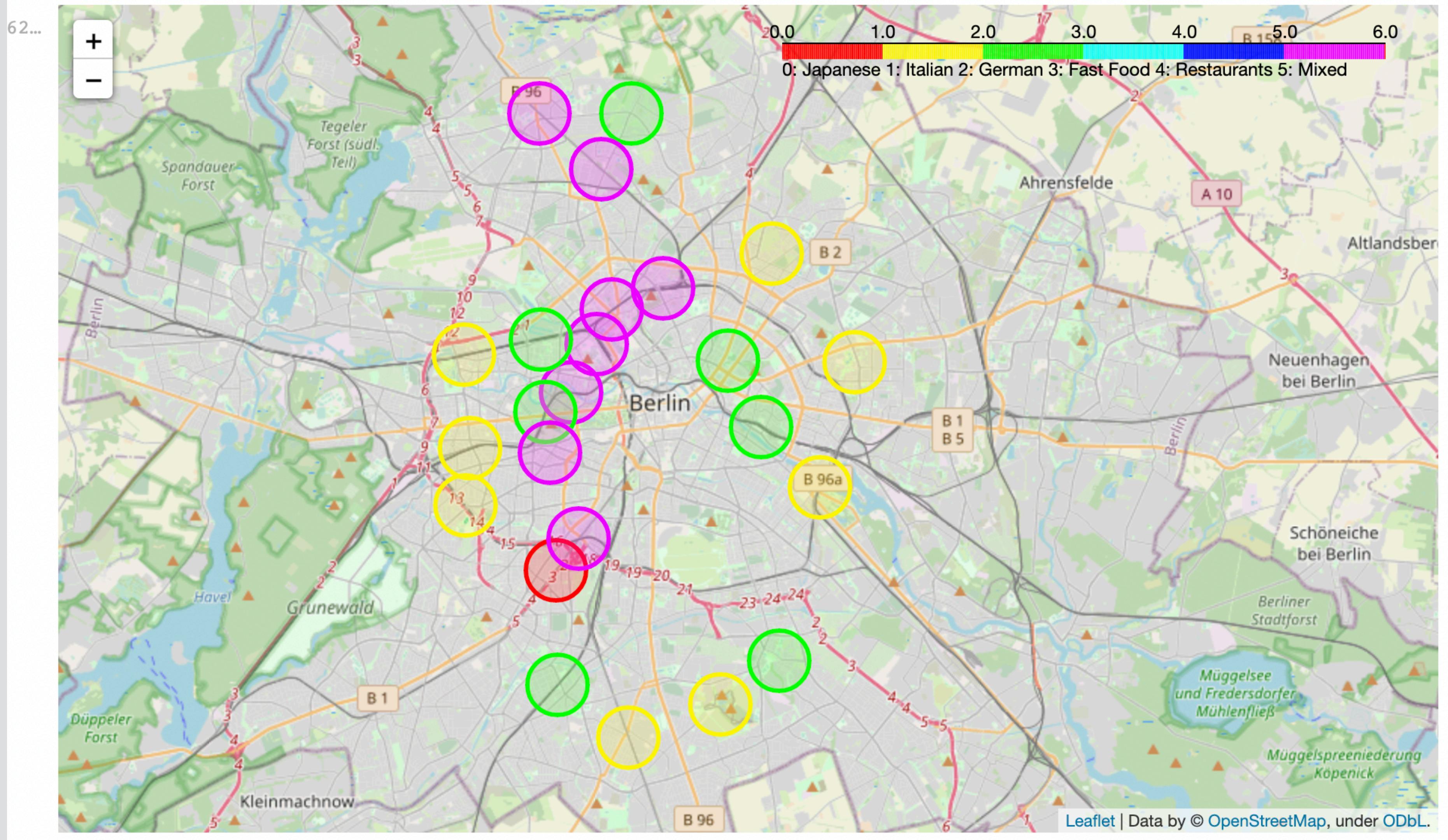
Restaurants
of the price
category
cheap are
dominated by
Japanese -
Like
restaurants in
the western
part of Berlin.



Resulting maps - Berlin Moderate Price Category

The price category moderate shows more than 50 % of all neighborhoods are dominated by Italian and German restaurants.

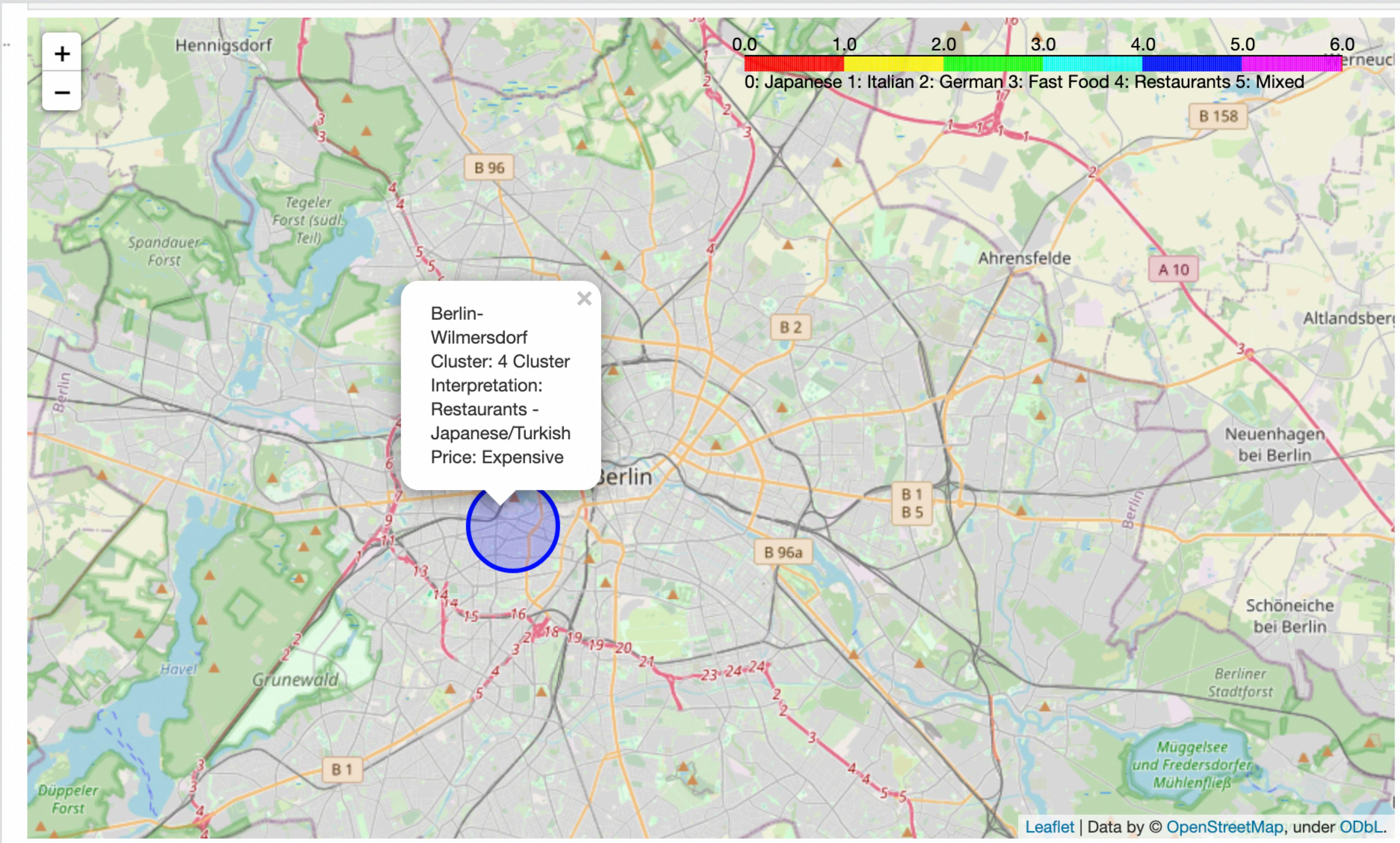
A smaller part has mixed restaurants and just one neighborhood has more Japanese restaurants



Resulting maps - Berlin Expensive Price Category

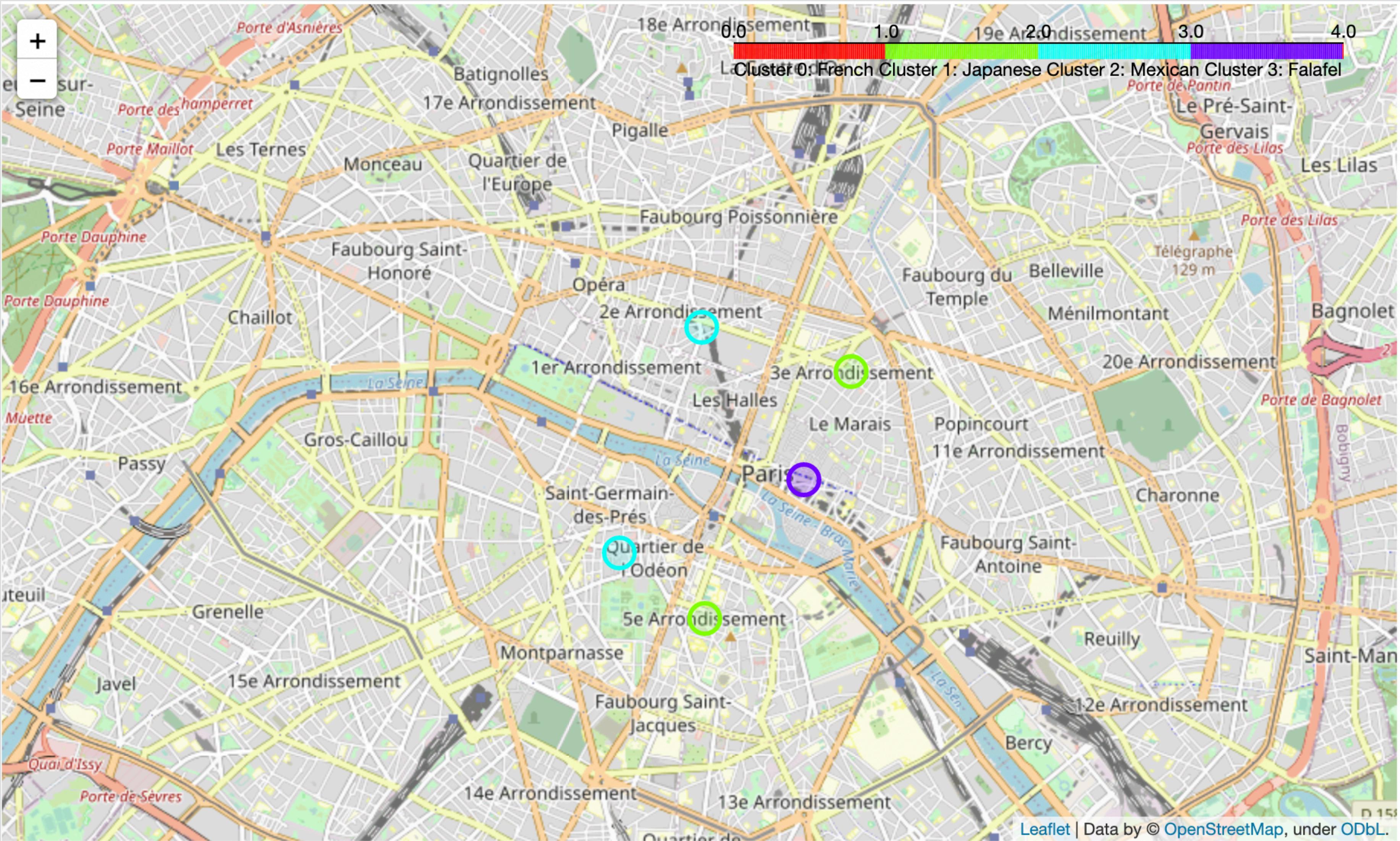
The price category expensive has just one neighborhood which is dominated by unspecified restaurants.

This seems to be a good position for a new location, but for a strictly recommendation, the unspecified restaurants need to be specified first.



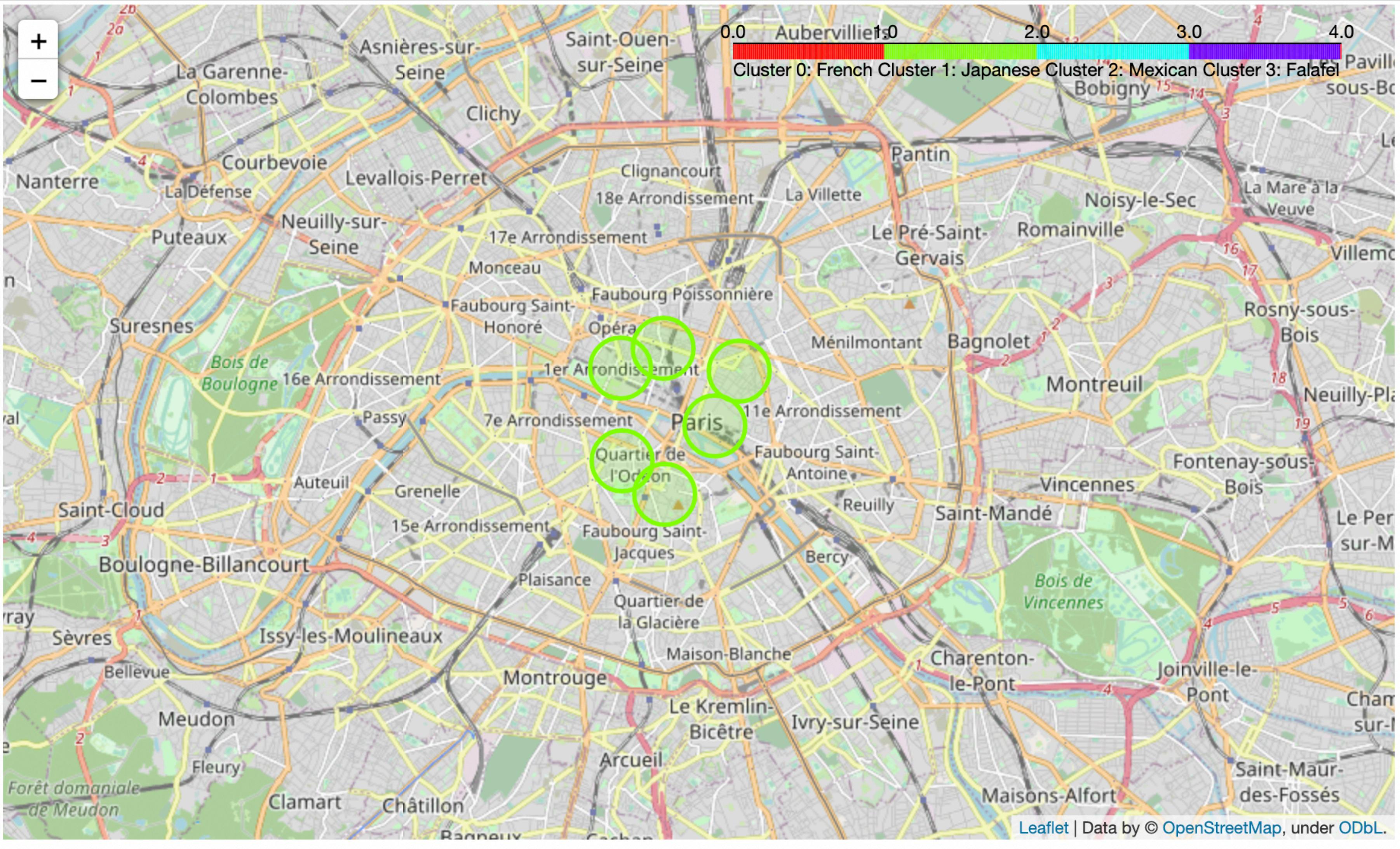
Resulting maps - Paris Cheap Price Category

The price category cheap shows three different clusters where Japanese and Mexican food dominates four out of five neighborhoods.



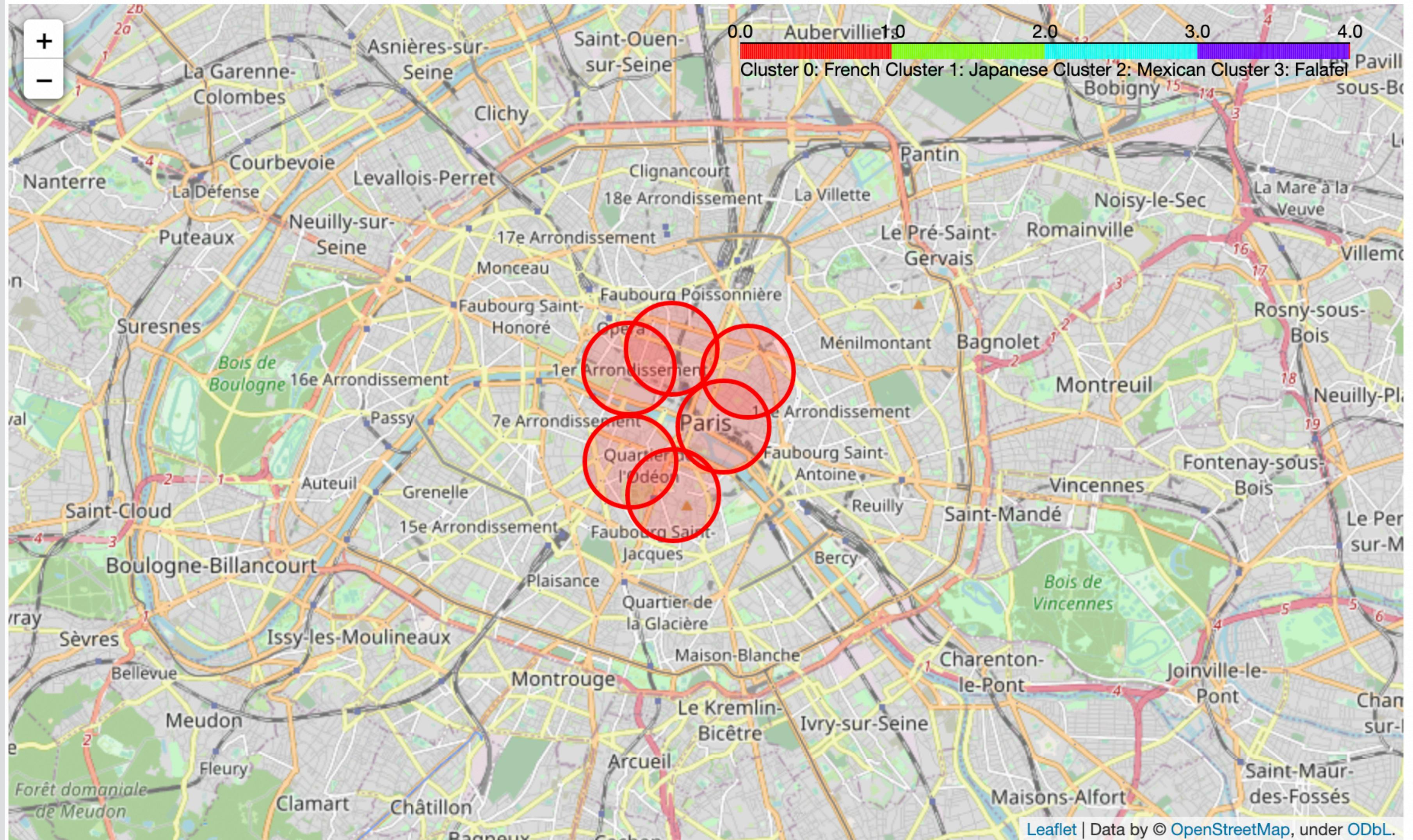
Resulting maps - Paris Moderate Price Category

The price category moderate is overall dominated by Japanese food.



Resulting maps - Paris Expensive Price Category

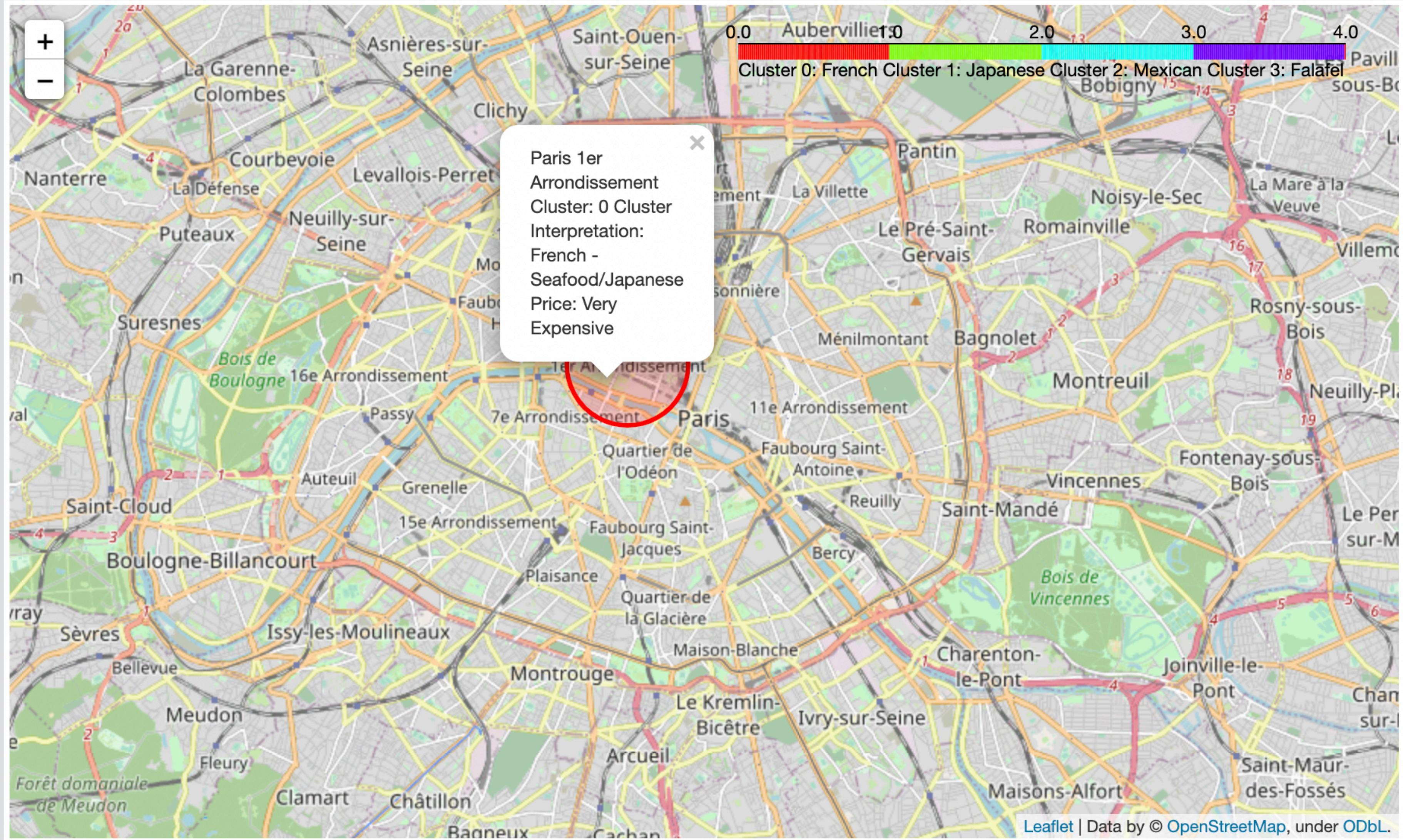
The price category expensive is common in every neighborhood and totally dominated by French restaurants.



Resulting maps - Paris very Expensive Price Category

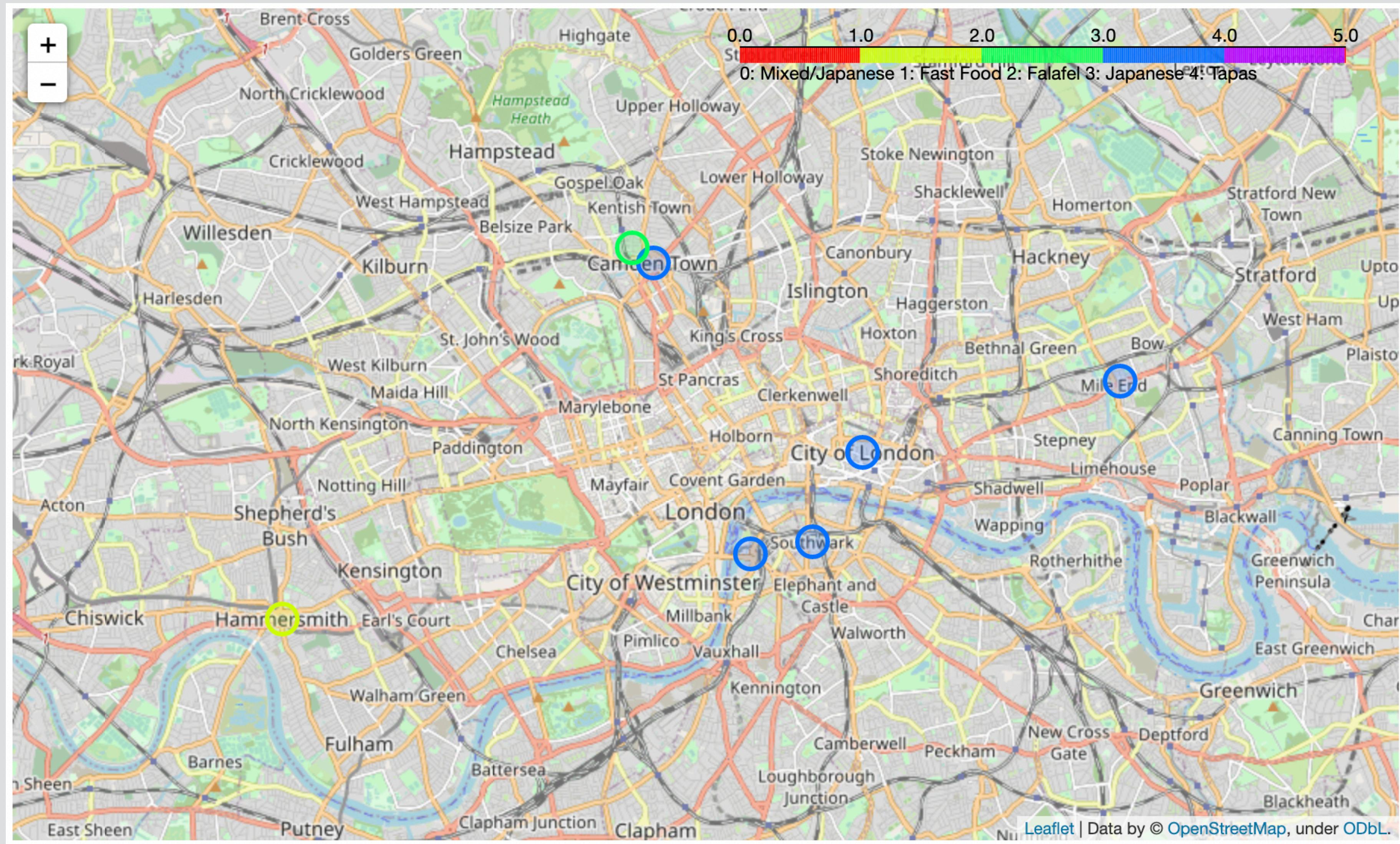
The price category very expensive is represented in only one neighborhood, the first Arrondissement and as well as the category expensive mainly dominated by French restaurants.

Here we can see that there is a good place for a high priced Japanese restaurant. The people like Japanese food as the price category 'Moderate' has shown because of the domination of Japanese restaurants in every neighborhood.



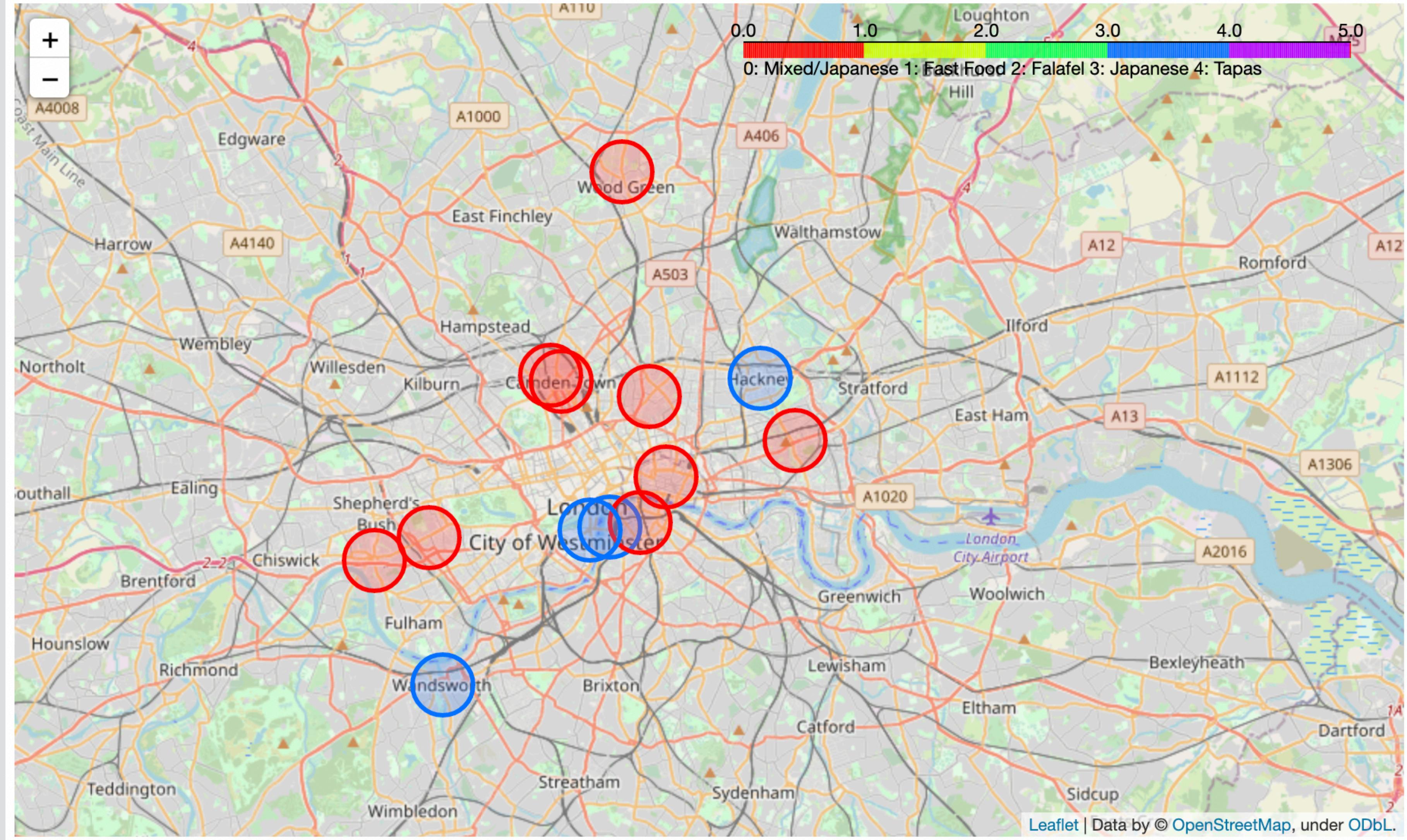
Resulting maps - London Cheap Price Category

The price category cheap is dominated by Japanese restaurants in 4 out of 6 neighborhoods.



Resulting maps - London Moderate Price Category

The price category moderate is separated in two main clusters, Mixed/Japanese and Japanese. This shows that Japanese food is very well accepted in London.



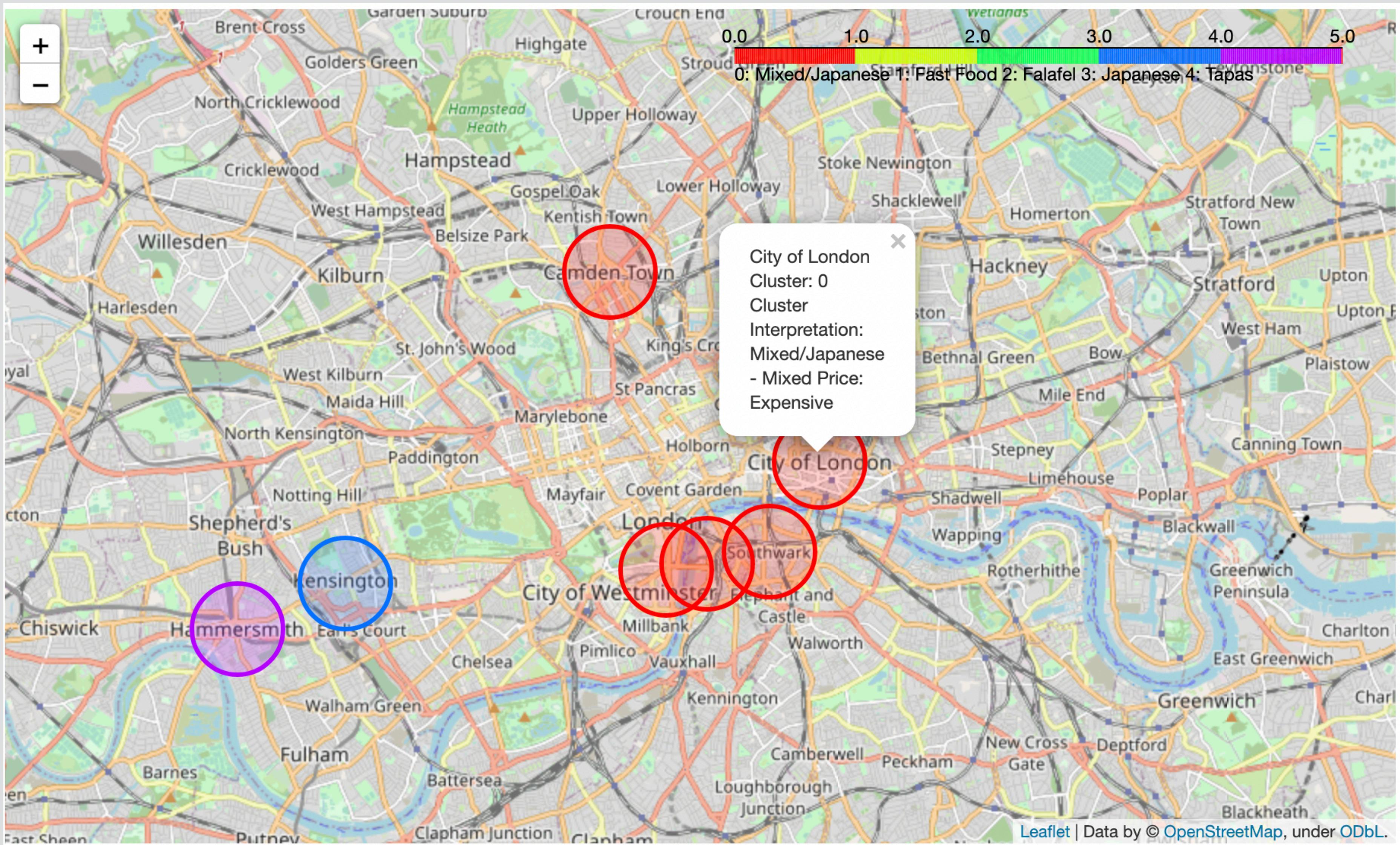
Resulting maps - London Expensive Price Category

The price category expensive shows there clusters Mixed/Japanese, Japanese and Tapas.

As Hammersmith has no Japanese restaurants, it might be a good place for a new one.

5 neighborhoods are called as Mixed/Japanese which means that these might be Japanese dominated neighborhoods.

A closer look to each of the neighborhoods leads to the result that just one neighborhood was Japanese dominated.



Result

The table shows the best neighborhoods for a new high priced Japanese restaurant

Berlin	Paris	London
Wilmersdorf	1er Arrondissement	City of London
	2eme Arrondissement	Southwark
	3eme Arrondissement	Westminster
	4eme Arrondissement	Hammersmith & Fulham
	5eme Arrondissement	Lambeth
	6eme Arrondissement	

Conclusion

- Creation of a recommendation for a specific kind of restaurant in a determined price category
- Understanding of the dominant restaurants in the neighborhoods of the capital cities London, Paris and Berlin.
- The clusters change with the data input, so one way to improve the recommendation would be, to increase the data input by using more than just one social network to access data about restaurants in the cities.