

# Comparison between Zurich and Geneva

## 1. Introduction

In this project I compared two swiss cities, Zurich and Geneva, by looking at the neighborhoods in terms of most common venues and population density.

The goal was to understand how different these two cities are and in which terms.

## 2. Data

The data were taken from the following wikipedia pages:

Zurich [https://de.wikipedia.org/wiki/Stadtteile\\_der\\_Stadt\\_Z%C3%BCrich](https://de.wikipedia.org/wiki/Stadtteile_der_Stadt_Z%C3%BCrich)

Geneva <https://de.wikipedia.org/wiki/Genf#Stadtviertel>

Unfortunately, the population data available for these two cities refer to different years. Since this is a preliminar analysis I decided to use the data of 2018 for Zurich and 2015 for Geneva.

The data have been downloaded as csv files and then uploaed as dataframes.

The data have been right formatted and the types corrected.

At the end, the two dataframes for Zurich and Geneva contained the following information:

- Name of the district (each district can have more than 1 neighborhood)
- Name of neighborhood
- Population Density
- Temporary Latitude column with the name of the neighborhood to be used to get locations
- Temporary Longitude column with the name of the neighborhood to be used to get locations

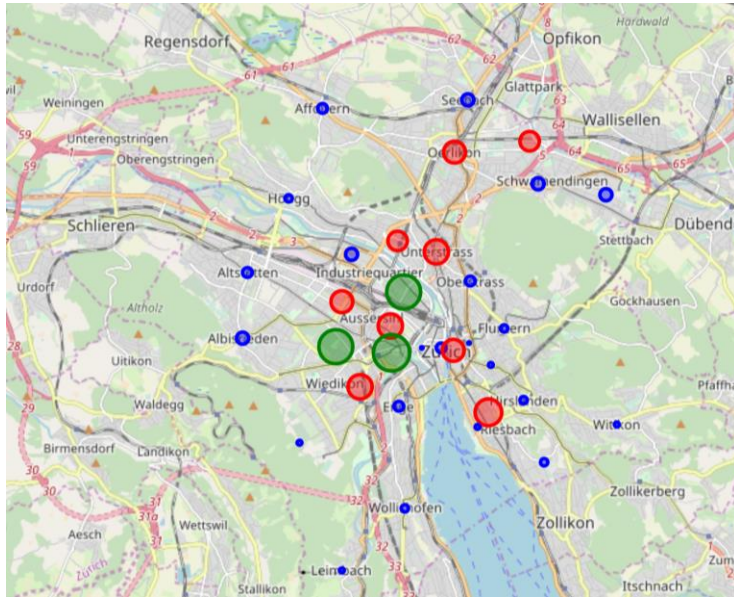
## 3. Methodology

First, I just looked at the map of the two cities and how the neighborhood are distributed. Then, I got the location of each neighborhood and by using them, by means of foursquare, I got the most popular venues of each neighborhood.

In order to cluster the neighborhood I used the venue categories as well as the population density for each neighborhood. The goal was to use a KMeans cluster by looking at the best number k (number of cluster). I found the best k for Zurich and Geneva is 3.

## 4. Results

### Zurich

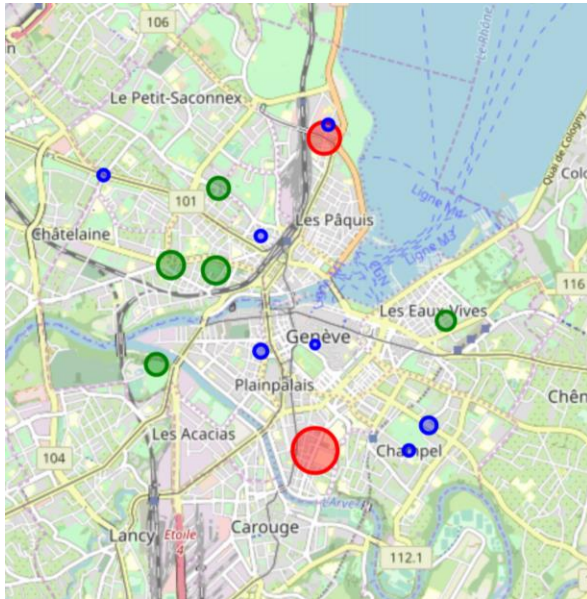


From the map we can see that:

- cluster 0 (blue) is the cluster with least dense populated neighborhoods, most of them are outside of the center
- cluster 1 (red) has average population density
- cluster 2 (green) is the one with most dense populated neighborhoods located in the centre.

By looking at the 3 most important categories for the neighborhoods of each clusters we may notice that for all clusters the population density is one of the categories on the top. The venues in Cluster 2 (green) are characteristic of the centre of a city. Cluster 0 (blue) includes touristic venues such as Museums and restaurants (due to the neighborhoods in the centre). Cluster 1 (red) is more heterogeneous, which make sense because this cluster is spread all over the city.

## Geneva



From the map and venue exploration we can see:

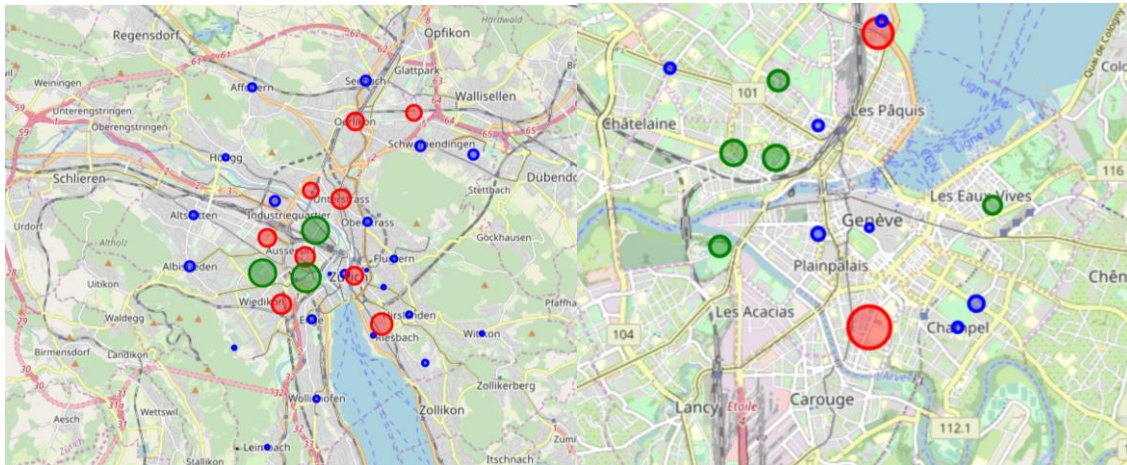
- one cluster (0, blue on the map) is spread all over the city and has a low population density, mainly characterised by restaurants
- the most dense populated neighborhoods are peripheral (cluster 1, red on the map).
- in terms of venues the categories seem to be heterogeneous.

## 5. Discussion

We can look at the two maps side by side:

Zurich

Geneva



By looking at the maps and the clusters I can say that in both cities there is a major cluster which is spread all over the city and has a low population density overall. In this sense Zurich and Geneva look similar, but this effect is much stronger in Zurich, which has more neighborhoods. On the other hand the distribution of population is different, the population density in Geneva is more homogeneous compared to that one in Zurich, a slightly higher population density can be noticed not in the centre (as in Zurich), but in the peripheral regions. Moreover the neighborhood of each cluster seems to form a kind of circle on the map, as the city would be divided in concentric circles.

## **6. Conclusion**

This preliminar analysis shows that Zurich and Geneva are not similar in terms of population and venues. In particular one can notice that Geneva has a concentric cluster displacement.