COMPARISON BETWEEN THE CITIES OF ZURICH AND GENEVA

A DATA SCIENCE PROJECT OF C.M.

OUTLINE

- Motivation

- Analysis method

- Results: Zurich and Geneva

- Comparison Zurich/Geneva

MOTIVATION

Compare the cities of Zurich and Geneva in terms of their neighborhoods by looking at:

- the population density

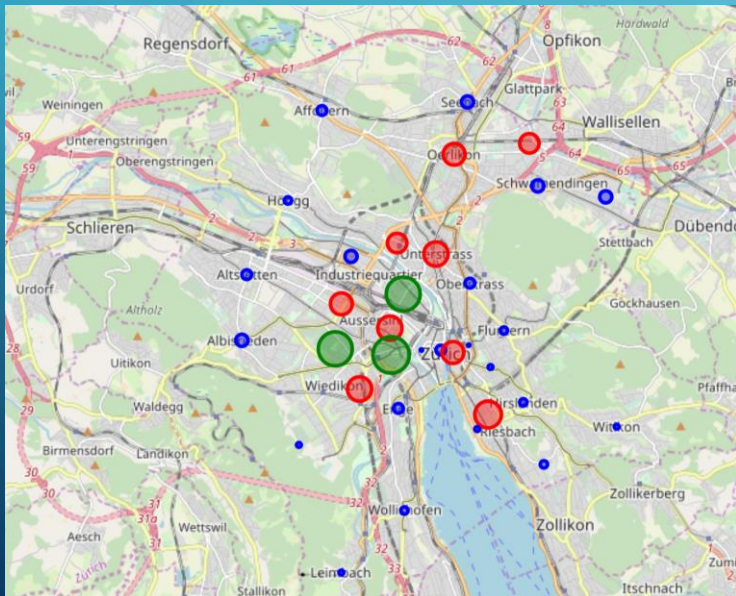- the venues of each neighborhood

ANALYSIS METHOD FOR EACH CITY

- <u>Method</u>: Clustering

- <u>Clustering algorithm</u>: Kmeans

- <u>Categories</u>: - neighborhood venues from foursquare

    - population density

- <u>Number of clusters k</u>: to be determined by looking at the average distance between points and their centroids as a function of k and then find the ellbow point of the curve

- <u>Visualization</u>: map visualization of the clusters

RESULTS: ZURICH

First five rows of the data frame

	District	Neighborhood	PopDens	Latitude	Longitude
0	Kreis 1	Rathaus	8597.368421	47.372649	8.544311
1	Kreis 1	Hochschulen	1185.714286	47.373846	8.548613
2	Kreis 1	Lindenhof	4304.347826	47.372996	8.540799
3	Kreis 1	City	1295.312500	47.372943	8.535346
4	Kreis 2	Wollishofen	3290.956522	47.342427	8.530708

- Locations got from geolocator=Nominatim(user_agent="foursquare_agent")
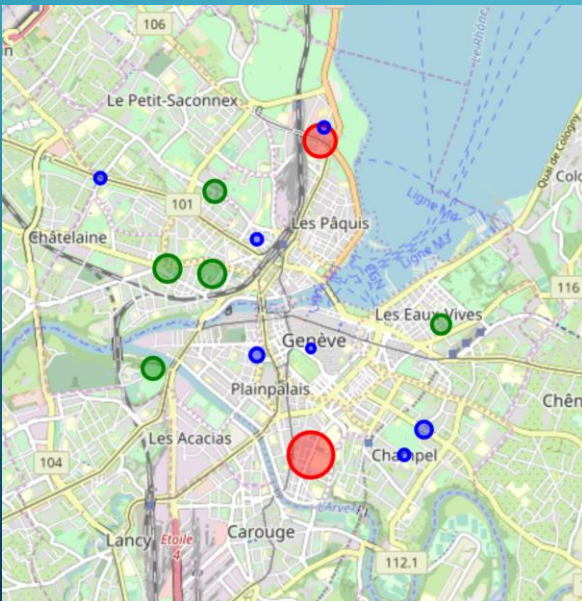- Getting venues by means of foursquare
- Clustering: best k=3

- Cluster 0 (blue): low pop. Density, spread allover the city, includes touristic venues like museums
- Cluster 1 (red): average pop. Density, spread allover the city, heterogeneous category venues
- Cluster 2 (green): hig pop. Density, located in the center, venues typical of centre.

RESULTS: GENEVA

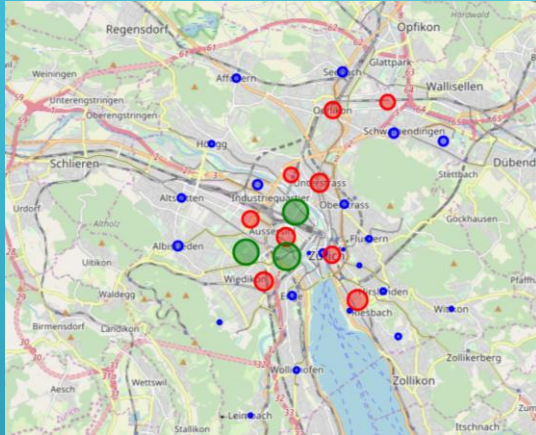First five rows of the data frame

	District	Neighborhood	PopDens	Latitude	Longitude
0	Cité	Cité – Centre	6339.622642	46.201035	6.146221
1	Cité	St.Gervais – Chantepoulet	9519.148936	46.210723	6.139083
2	Cité	Délices – Grottes – Montbrillant	20302.941176	46.207626	6.133291
3	Cité	Pâquis	25357.142857	46.219521	6.147314
4	Plainpalais	Champel	9982.222222	46.191490	6.158405

- Locations got from geolocator=Nominatim(user_agent="foursquare_agent")
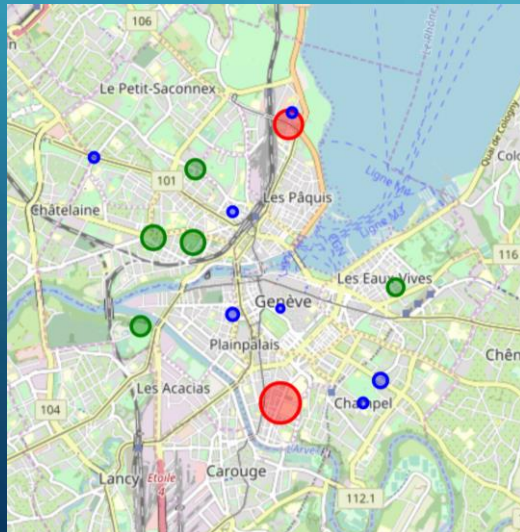- Getting venues by means of foursquare
- Clustering:
  best k=3

- Cluster 0 (blue): low pop. Density, spread allover the city
- Cluster 1 (red): high pop. Density, on the border of the city (on north-south axis)
- Cluster 2 (green): average pop. Density, on the border of the city (west-east axis

- Heterogeneous category venues

COMPARISON: ZURICH-GENEVA

SIMILARITIES

- Both cities have a major cluster spread all over the city, with a low population density

- One cluster is most populated than the others

DIFFERENCES

- High density population in different regions (Zurich in the center, Geneva on the border)

- Geneva has a concentric cluster displacement