Neighborhoods in Dusseldorf

An exploration of Dusseldorf, Germany and neighborhoods

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1. Introduction

Definition of the problem

- My dream was to open a store or shop one day in the city I'm born in. That city is Ratingen, Germany. Currently, I'm working and living in Dusseldorf. As it is now time to open a store, I can decide to do that in Ratingen or in Dusseldorf. Dusseldorf is much bigger than Ratingen. Nevertheless, Ratingen has less shops and that's why the chance for success could be bigger. Maybe other cities in the neighborhood of Dusseldorf are better!?

- My journey should give insights in environment of these two cities and other cities in the neighborhood. The result should be a suggestion where to open a shop. So, the project is interesting for everybody how lives near by or wants to open a shop close to Dusseldorf. The project give insights about how many spots of interest already exists. E.g. if there are already 10 bakeries in a city, you shouldn't open the 11s bakery if you want to be successful…
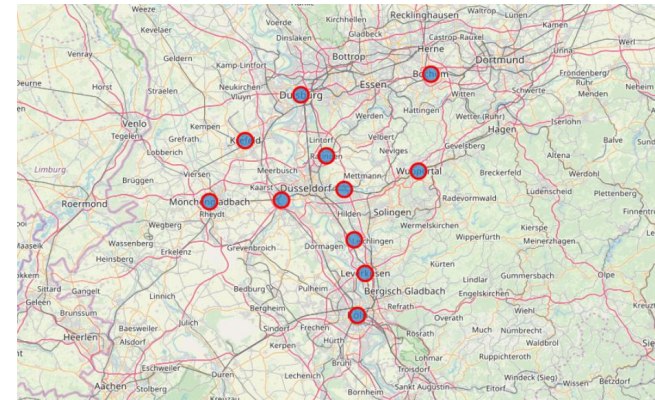
2. Description of the data

I use data from foursquare.com, where I search with the latitude and longitude of both cities as well as the data of their neighborhoods.

I use geopy library to get the latitude and longitude values of Dusseldorf, Ratingen and so on. To get the values for the neighborhoods I set-up a dataframe and use a self-defined function called *getlocation*. The most common venues will show which shops and stores are already very present in each city.

	Borough	Neighborhood	Latitude	Longitude
0	Dusseldorf	Ratingen	51.297326	6.849350
1	Dusseldorf	Bochum	51.481811	7.219664
2	Dusseldorf	Cologne	50.938361	6.959974
3	Dusseldorf	Wuppertal	51.264018	7.178037
4	Dusseldorf	Monchengladbach	51.194698	6.435364
5	Dusseldorf	Leverkusen	51.032474	6.988119
6	Dusseldorf	Duisburg	51.434999	6.759562
7	Dusseldorf	Neuss	51.198178	6.691648
8	Dusseldorf	Erkrath	51.222206	6.912324
9	Dusseldorf	Krefeld	51.333120	6.562334
10	Dusseldorf	Langenfeld	51.108487	6.948959

3. Methodology

As a first step I will visualise the map of Dusseldorf and surroundings to give a better expression about the neighborhood.

With foursquare.com I will explore the neighborhood of Dusseldorf further. I will search for the main venues in each city. Then I will analyse each neighborhood and cluster the neighborhoods with k-means. Additionally, I will make a test for the best k to be sure to cluster correctly.

4. Results

4.1 Most common venues per city:

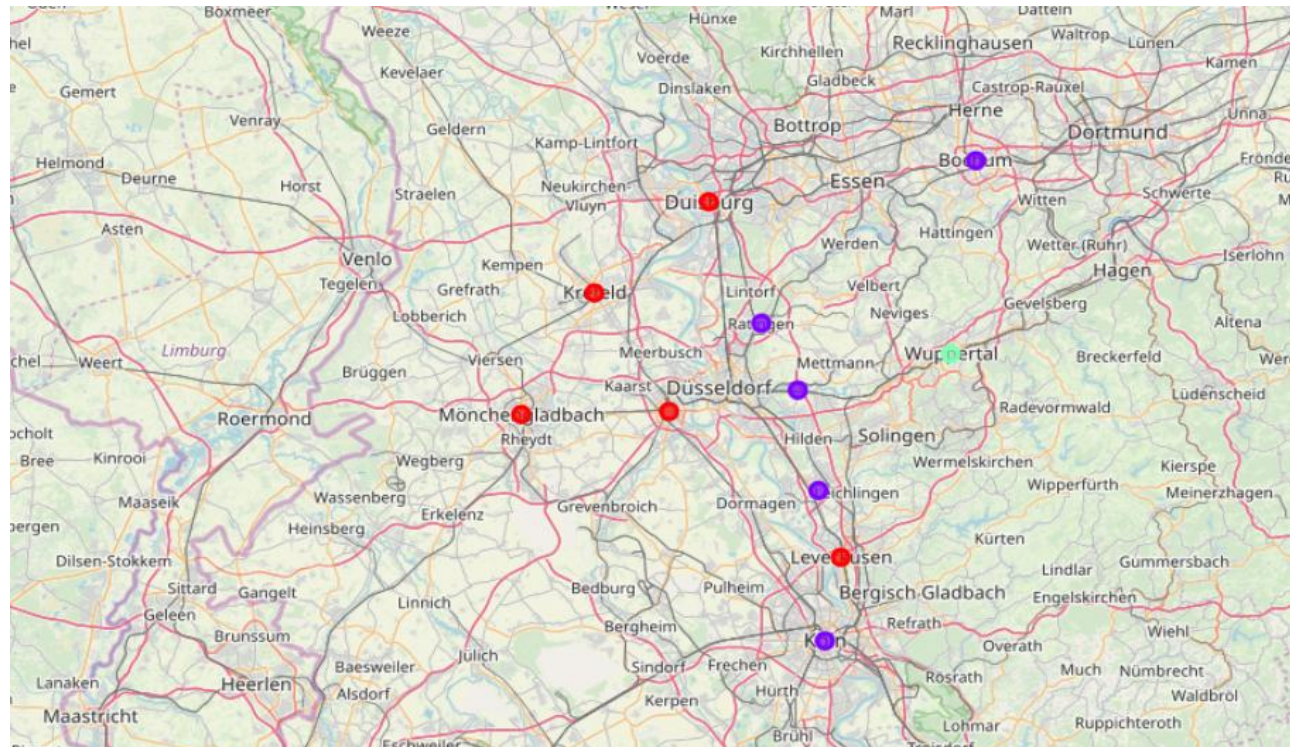|	Neighborhood	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue	9th Most Common Venue	10th Most Common Venue
0	Bochum	Bakery	Greek Restaurant	German Restaurant	Toy / Game Store	Beer Store	Bookstore	Restaurant	Coffee Shop	Mongolian Restaurant	Clothing Store
1	Cologne	Plaza	Park	Art Museum	Beer Bar	Steakhouse	Concert Hall	Brewery	Jazz Club	Pedestrian Plaza	Gastropub
2	Duisburg	Thai Restaurant	Café	Asian Restaurant	Trattoria/Osteria	Ice Cream Shop	Indie Movie Theater	Salon / Barbershop	Brewery	Turkish Restaurant	Clothing Store
3	Erkrath	Bakery	Hotel	German Restaurant	Ice Cream Shop	Gas Station	Supermarket	Fast Food Restaurant	Shopping Mall	Drugstore	Chinese Restaurant
4	Krefeld	Café	Italian Restaurant	Indian Restaurant	Bookstore	Drugstore	Chinese Restaurant	German Restaurant	Gastropub	Gas Station	Fast Food Restaurant
5	Langenfeld	Drugstore	Pizza Place	Plaza	Café	Bar	Shopping Mall	Restaurant	Burger Joint	Gastropub	Gas Station
6	Leverkusen	Italian Restaurant	Café	Chinese Restaurant	Ice Cream Shop	Drugstore	Shopping Mall	Coffee Shop	Clothing Store	German Restaurant	Gastropub
7	Monchengladbach	Argentinian Restaurant	Shopping Mall	German Restaurant	Coffee Shop	Clothing Store	Café	Pizza Place	Gym / Fitness Center	Asian Restaurant	Sushi Restaurant
8	Neuss	Café	Brewery	Ice Cream Shop	Gastropub	Italian Restaurant	Pub	Turkish Restaurant	Gym / Fitness Center	Asian Restaurant	Concert Hall
9	Ratingen	Plaza	Brewery	Ice Cream Shop	Irish Pub	Coffee Shop	Café	Greek Restaurant	Restaurant	German Restaurant	Bar
10	Wuppertal	Supermarket	Cable Car	Grilled Meat Restaurant	Trail	Theater	Gas Station	Pub	Café	German Restaurant	Gastropub

4. Results

4.2 Clustering data:

	Borough	Neighborhood	Latitude	Longitude	Cluster Labels	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	Dusseldorf	Ratingen	51.297326	6.849350	1	Plaza	Brewery	Ice Cream Shop	Irish Pub	Coffee Shop	Café	Greek Restaurant	Restaurant	German Restaurant	Bar
1	Dusseldorf	Bochum	51.481811	7.219664	1	Bakery	Greek Restaurant	German Restaurant	Toy / Game Store	Beer Store	Bookstore	Restaurant	Coffee Shop	Mongolian Restaurant	Clothing Store
2	Dusseldorf	Cologne	50.938361	6.959974	1	Plaza	Park	Art Museum	Beer Bar	Steakhouse	Concert Hall	Brewery	Jazz Club	Pedestrian Plaza	Gastropub
3	Dusseldorf	Wuppertal	51.264018	7.178037	2	Supermarket	Cable Car	Grilled Meat Restaurant	Trail	Theater	Gas Station	Pub	Café	German Restaurant	Gastropub
4	Dusseldorf	Monchengladbach	51.194698	6.435364	0	Argentinian Restaurant	Shopping Mall	German Restaurant	Coffee Shop	Clothing Store	Café	Pizza Place	Gym / Fitness Center	Asian Restaurant	Sushi Restaurant
5	Dusseldorf	Leverkusen	51.032474	6.988119	0	Italian Restaurant	Café	Chinese Restaurant	Ice Cream Shop	Drugstore	Shopping Mall	Coffee Shop	Clothing Store	German Restaurant	Gastropub
6	Dusseldorf	Duisburg	51.434999	6.759562	0	Thai Restaurant	Café	Asian Restaurant	Trattoria/Osteria	Ice Cream Shop	Indie Movie Theater	Salon / Barbershop	Brewery	Turkish Restaurant	Clothing Store
7	Dusseldorf	Neuss	51.198178	6.691648	0	Café	Brewery	Ice Cream Shop	Gastropub	Italian Restaurant	Pub	Turkish Restaurant	Gym / Fitness Center	Asian Restaurant	Concert Hall
8	Dusseldorf	Erkrath	51.222206	6.912324	1	Bakery	Hotel	German Restaurant	Ice Cream Shop	Gas Station	Supermarket	Fast Food Restaurant	Shopping Mall	Drugstore	Chinese Restaurant
9	Dusseldorf	Krefeld	51.333120	6.562334	0	Café	Italian Restaurant	Indian Restaurant	Bookstore	Drugstore	Chinese Restaurant	German Restaurant	Gastropub	Gas Station	Fast Food Restaurant
10	Dusseldorf	Langenfeld	51.108487	6.948959	1	Drugstore	Pizza Place	Plaza	Café	Bar	Shopping Mall	Restaurant	Burger Joint	Gastropub	Gas Station

4. Results

4.3 Visualization of clustering – Map of different cluster

5. Discussion of results

1. First of all, the neighborhood of Dusseldorf is very large. You can see that from the latitude and longitude of the different cities around Dusseldorf. The latitude and the longitude don't differ much.

2. Furthermore, you can observe that Erkrath has lots of good restaurants, but no Cafe under the first 10 common venues. Do you want to open a Cafe in Erkrath?

3. In Duisburg, there are already lots of restaurant or other shops related to food and drink. It seems that there are no famous parks, rivers, or plazas. So, if you like the nature, it is maybe not the best place to move to. But if Duisburg is your preferred city, I recommend to open a concert hall or a gym to entertain the population.

4. Wuppertal seems to be a special city, as it doesn't belong to any other clustered cities. Instead, Wuppertal builds its own cluster.

5. You have also seen, that in all cities already a lot of Cafes and Italian Restaurants exist. So it could make sense to open a store which is not part of the list to be specializied.

6. Conclusion

Finally, what I did was to explore the data of common venues for different cities in the neighborhood of Dusseldorf. As Dusseldorf is known as very large city having already lots of stores, it could be a good option to discover the neighborhood of Dusseldorf. The question is in which city it makes sense to open a store of which typ. From the observation above, I recommend not to open a Cafe or an Italian Restaurant, as most of the cities have their most common venues here. Go for a Game shop or a Flower Shop, something which is very sheldom in the data set. That makes you unique and increases your prospects for success.

To find out, why Wuppertal is specific, we need more data of that city. That will be the good task for the next journey...