Capstone Project - The Battle of the Neighborhoods

Yet another Japanese Restaurant in Düsseldorf

1 Introduction

- Düsseldorf is a German city with a large Japanese Diaspora
- Our client is a recent arrival looking to open a Japanese Restaurant in D'dorf
- Our goal is to find a good location and a good type of Japanese food to offer

2 Data

- For our analysis we use the following data:
  - Area data from *DasOertliche*, the German phone register
  - Geospatial data from the *geocoder arcgis* package
  - Venue data from *FourSquare*

3 Methodology

▶ Postcode areas are scraped from DasOertliche

▶ Coordinates are added from the geocoder arcgis package

▶ Venues from the different areas are retrieved from FourSquare

▶ After discarding areas with less than 15 venues, there are 15 (mostly central) neighborhoods left to consider

3 Methodology

▶ Venue categories are grouped to later get a lower variance model

```
array(['Grocery Store', 'Japanese Restaurant', 'Ramen Restaurant',
       'Italian Restaurant', 'Korean Restaurant', 'Arts & Crafts Store',
       'Pastry Shop', 'Souvlaki Shop', 'Ice Cream Shop', 'Café',
       'Chinese Restaurant', 'Vegetarian / Vegan Restaurant', 'Bar',
       'Hotel', 'Cocktail Bar', 'Sushi Restaurant', 'Brewery',
       'Burger Joint', 'Bakery', 'Ethiopian Restaurant',
       'Thai Restaurant', 'Greek Restaurant', 'Bubble Tea Shop',
       'Frozen Yogurt Shop', 'Breakfast Spot', 'Turkish Restaurant',
       'Indie Movie Theater', 'Soba Restaurant', 'Bookstore', 'Theater',
       'North Indian Restaurant', 'Coffee Shop', 'Cigkofte Place',
       'Seafood Restaurant', 'Bistro', 'Doner Restaurant', 'Salad Place',
       'General Entertainment', 'Fast Food Restaurant', 'Pizza Place',
       'Pharmacy', 'Donut Shop', 'Advertising Agency',
       'Mexican Restaurant', 'Middle Eastern Restaurant',
       'Sporting Goods Shop', 'Shoe Store', 'Trattoria/Osteria',
       'Yoga Studio', 'Indian Restaurant', 'French Restaurant',
       'Hotel Bar', 'Tram Station', 'Auto Dealership', 'Plaza',
       'Dessert Shop', 'Furniture / Home Store', 'Record Shop',
       'Boutique', 'Clothing Store', 'Steakhouse', 'Drugstore',
       'Jewelry Store', 'Electronics Store', 'Shopping Mall', 'Fountain',
       'Perfume Shop', 'Pub', 'Cosmetics Shop', 'German Restaurant',
       "Men's Store", 'Restaurant', 'Burrito Place', 'Gift Shop',
       'Farmers Market', 'Wine Bar', 'Juice Bar', 'Pedestrian Plaza',
       'Falafel Restaurant', 'Jazz Club', 'History Museum',
       'Argentinian Restaurant', 'Chocolate Shop', 'BBQ Joint',
       'Nightclub', 'Sports Bar', 'Irish Pub', 'Opera House',
       'Comedy Club', 'Beer Bar', 'Optical Shop', 'Museum',
       'Organic Grocery', 'Beer Garden', 'Creperie', 'Baby Store',
       'Gourmet Shop', 'Vietnamese Restaurant', 'Cupcake Shop',
       'Rock Club', 'Business Service', 'Hostel', 'Miscellaneous Shop',
       'Art Gallery', 'Liquor Store', 'Spanish Restaurant',
       'Light Rail Station', 'Gay Bar', 'Beer Store', 'Park', 'Taverna',
       'Art Museum', 'Gym / Fitness Center', 'Pool', 'Deli / Bodega',
       'Laundromat', 'Supermarket', 'Brazilian Restaurant',
       'Sandwich Place', 'Asian Restaurant', 'Bus Stop', 'Dive Bar',
       'Tapas Restaurant', 'Salon / Barbershop', 'Slovak Restaurant',
       'Poke Place', 'Scenic Lookout', 'Currywurst Joint', 'Soup Place',
       'Food Court', 'Kebab Restaurant', 'Cheese Shop',
       'Mediterranean Restaurant', 'Bank', 'Flea Market', 'Pet Store',
       'Laser Tag', 'Flower Shop', 'Soccer Field',
       'Comfort Food Restaurant', 'Massage Studio', 'Metro Station',
       'Mobile Phone Shop', 'Hookah Bar', 'Portuguese Restaurant',
       'Mini Golf', 'Gym', 'Water Park', 'Modern European Restaurant',
       'Bowling Alley', 'Tailor Shop', 'Dim Sum Restaurant',
       'Colombian Restaurant', 'Polish Restaurant', 'Shipping Store',
       'Jewish Restaurant', 'Rhenisch Restaurant', 'American Restaurant',
       'Photography Studio', 'Gastropub', 'Playground',
       'Gluten-free Restaurant', 'Trail', 'Snack Place', 'Hockey Rink',
       'Event Service', 'Platform'], dtype=object)
```

```
Category simple
Bakery               25
Bank                  5
Business Services     5
Café                 51
Culture              17
Drinking Place       72
Groceries            24
Hotel                55
Japanese             44
Public Transport     19
Recreation           28
Restaurant other    295
Shopping            174
Sports Venue         11
Name: Venue, dtype: int64
```
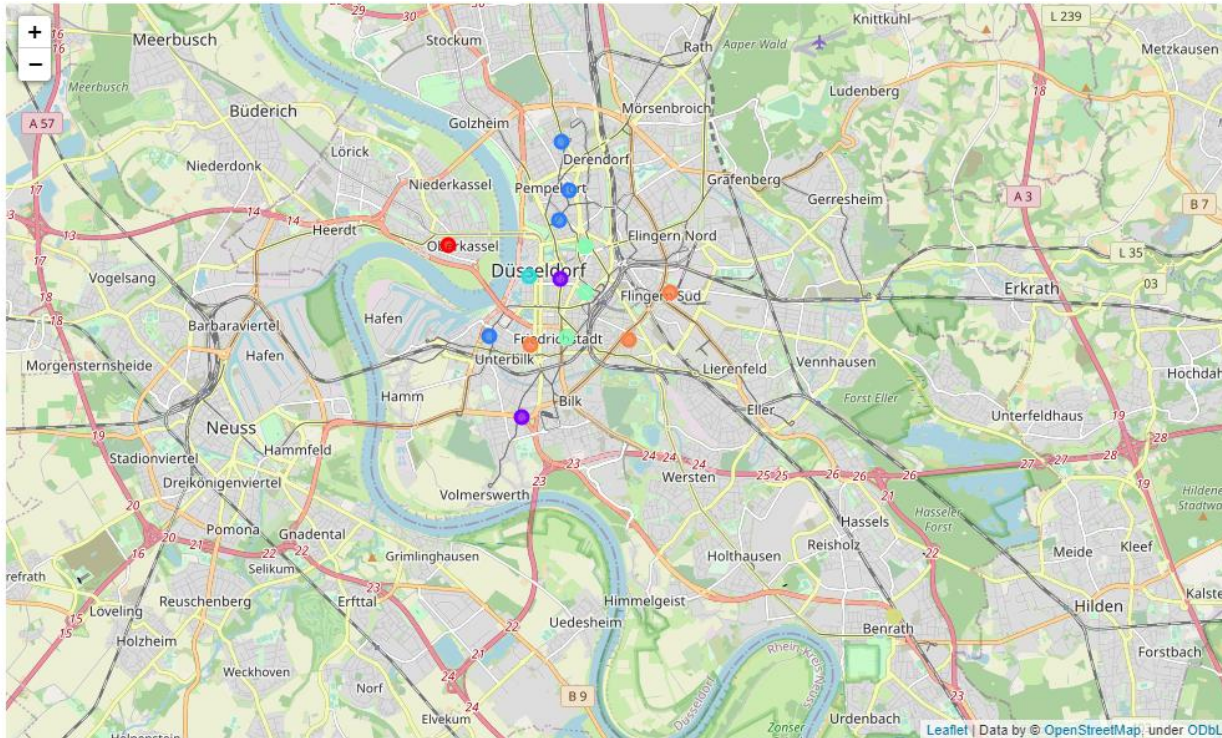
3 Methodology

▶ Areas are clustered based on the relative frequency of the simplified categories excluding the „Japanese" category

▶ Cluster 4 has the highest share of Japanese restaurants (~10%) and so seems to be a good environment

Cluster Labels	Postal Code	Latitude	Longitude	Bakery	Bank	Business Services	Café	Culture	Drinking Place	Groceries	Hotel	Japanese	P Trans
0	40545.000000	51.229753	6.751326	0.034483	0.034483	0.000000	0.068966	0.000000	0.275862	0.034483	0.034483	0.000000	0.034
1	40217.500000	51.211910	6.776992	0.060101	0.000000	0.000000	0.020202	0.040152	0.015152	0.075000	0.060354	0.070707	0.000
2	40412.750000	51.233663	6.778073	0.043940	0.007644	0.000000	0.054421	0.004808	0.078203	0.036296	0.043974	0.018157	0.028
3	40213.000000	51.224287	6.773790	0.020833	0.000000	0.000000	0.062500	0.052083	0.187500	0.020833	0.031250	0.000000	0.000
4	40212.000000	51.221615	6.787525	0.037117	0.000000	0.019591	0.081425	0.028189	0.074235	0.000000	0.143505	0.099698	0.024
5	40597.000000	51.165470	6.874402	0.000000	0.055556	0.055556	0.166667	0.000000	0.055556	0.111111	0.000000	0.000000	0.111
6	40225.666667	51.215830	6.795913	0.004975	0.000000	0.000000	0.019900	0.004975	0.079320	0.047123	0.082703	0.004975	0.031

3 Methodology

▶ Cluster 4 is located centre-east (light green) in Düsseldorf

3 Methodology

▶ Within the cluster only one Japanese restarant (Tokyo Lounge) is in postal code 40250

▶ Tokyo Lounge offers unspecified Japanese food and is rated 7.6

▶ Otherwise Ramen restaurants seem to be quite popular

	Postal Code	Neighborhood Latitude	Neighborhood Longitude	Venue_ID	Venue	Venue Latitude	Venue Longitude	Venue Category	Category simple
1	40210	51.221500	6.789191	4b3b8db9f964a520b27525e3	Kushi Tei of Tokyo	51.223275	6.789558	Japanese Restaurant	Japanese
2	40210	51.221500	6.789191	4b448154f964a520bef525e3	Kagaya	51.221320	6.788232	Japanese Restaurant	Japanese
3	40210	51.221500	6.789191	5053696ce4b08e1d3c985b79	Nagomi	51.221913	6.786502	Japanese Restaurant	Japanese
4	40210	51.221500	6.789191	4b3be8f6f964a520207e25e3	Takumi	51.223429	6.788531	Ramen Restaurant	Japanese
21	40210	51.221500	6.789191	4b7e729cf964a52072ed2fe3	Hyuga	51.224525	6.789297	Sushi Restaurant	Japanese
24	40210	51.221500	6.789191	4f115acee4b09e81d8909f8a	Waraku	51.223664	6.787536	Japanese Restaurant	Japanese
26	40210	51.221500	6.789191	53429155498e8dd5982f0e8e	Takezo Ramen Bar	51.222617	6.790507	Ramen Restaurant	Japanese
27	40210	51.221500	6.789191	5b0c5e3a31ac6c002c6c3868	Tonkatsu Gonta	51.223490	6.788785	Japanese Restaurant	Japanese
32	40210	51.221500	6.789191	4bb64cb06edc76b092b7301c	Naniwa	51.224915	6.788172	Ramen Restaurant	Japanese
34	40210	51.221500	6.789191	59da041146e1b64f7c9cbe9f	Takumi 3rd Tori & Veggie	51.224532	6.788735	Ramen Restaurant	Japanese
36	40210	51.221500	6.789191	4b65c6a0f964a520f8fe2ae3	Yabase	51.224732	6.788633	Japanese Restaurant	Japanese
39	40210	51.221500	6.789191	4bc4a7d7f8219c74eea8b710	Naniwa Sushi & More	51.224845	6.788217	Sushi Restaurant	Japanese
42	40210	51.221500	6.789191	50cb1954e4b0e9d62c78c910	Takumi Tonkotsu & Gyoza (麺処 匠 二代目) (Takumi Ton...	51.225223	6.788210	Japanese Restaurant	Japanese
46	40210	51.221500	6.789191	4bf178b46bfe0f47bdc6d838	Soba-An	51.224914	6.787977	Soba Restaurant	Japanese
48	40210	51.221500	6.789191	562e3587498e62a645809d9e	Maruyasu	51.224577	6.785816	Japanese Restaurant	Japanese
57	40210	51.221500	6.789191	558ef0bd498e512b2db575c7	Yaki The Emon 焼左衛門	51.224743	6.788877	Japanese Restaurant	Japanese
64	40210	51.221500	6.789191	4b4e2b6af964a520e0e326e3	Nagaya	51.225381	6.786096	Japanese Restaurant	Japanese
68	40210	51.221500	6.789191	58515033f7f8dd196fbe8f2e	eat Tokyo	51.223135	6.790070	Ramen Restaurant	Japanese
69	40210	51.221500	6.789191	5810df5538faaa7ba8820c50	Yoshi	51.224217	6.785603	Japanese Restaurant	Japanese
70	40210	51.221500	6.789191	4c0d34d8c700c9b6950ea2dd	Fujiyama	51.219727	6.784333	Sushi Restaurant	Japanese
74	40210	51.221500	6.789191	4cf014b4ed62721ed93864fd	Okinii	51.223453	6.788300	Japanese Restaurant	Japanese
85	40210	51.221500	6.789191	5bbe4960bed483002c64a0f1	Tokyo Ramen	51.224120	6.787225	Ramen Restaurant	Japanese
104	40211	51.229510	6.789159	515080378aca1877ebad8170	sumi.	51.231848	6.792566	Japanese Restaurant	Japanese
118	40211	51.229510	6.789159	50cb1954e4b0e9d62c78c910	Takumi Tonkotsu & Gyoza (麺処 匠 二代目) (Takumi Ton...	51.225223	6.788210	Japanese Restaurant	Japanese
367	40215	51.213835	6.784225	503541ffe4b0bd14213316db	Tokyo Lounge	51.217971	6.782266	Japanese Restaurant	Japanese

4. Conclusion

- We recommend our client to open the restaurant in the post code area 40215 since this post code area is in a cluster that boasts many Japanese restaurants but itself has only one

- We further recommend Ramen because Ramen is generally quite popular but not present in this specific area

- More data especially on the areas we had to discard in the beginning or different data (e.g. demographic data) might improve our analysis and lead to different reults