

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 | |

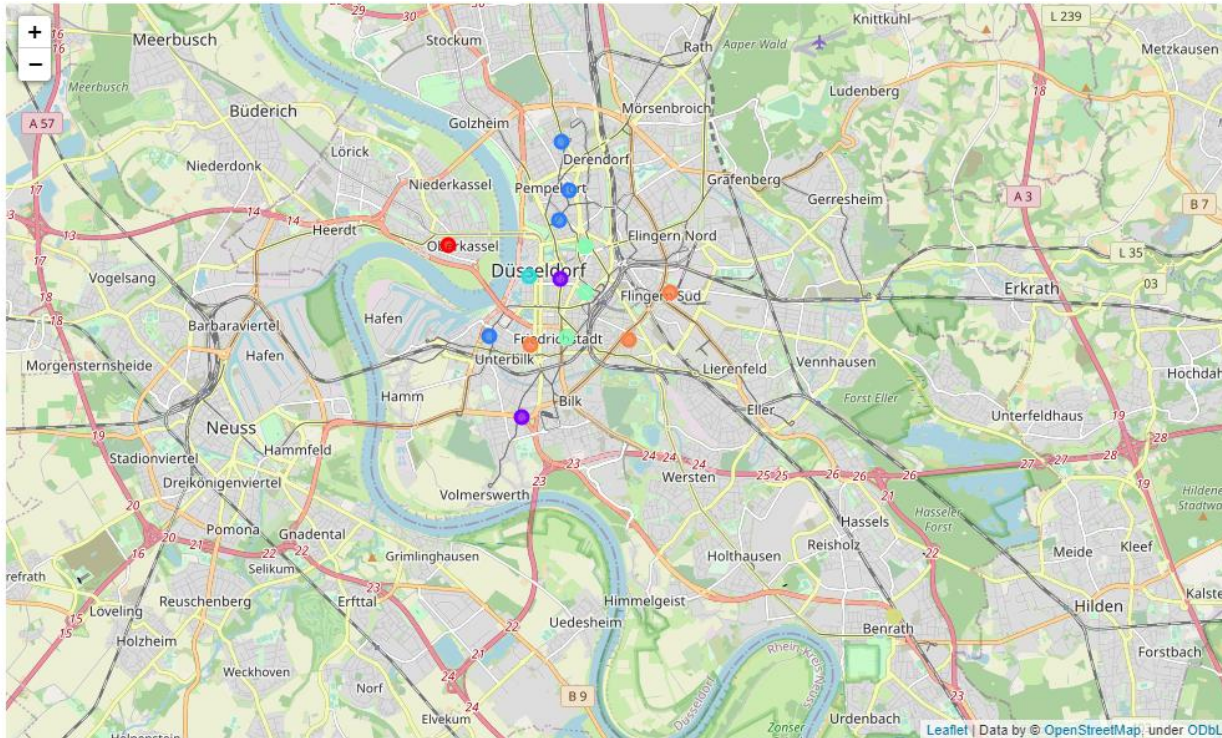
3 Methodology

- ▶ 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

| | Postal Code | Latitude | Longitude | Bakery | Bank | Business Services | Café | Culture | Drinking Place | Groceries | Hotel | Japanese | Pi Trans |
|----------------|--------------|-----------|-----------|----------|----------|-------------------|----------|----------|----------------|-----------|----------|----------|----------|
| Cluster Labels | | | | | | | | | | | | | |
| 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 | 8.789191 | 4b3b8db9f964a520b27525e3 | Kushi Tei of Tokyo | 51.223275 | 8.789558 | Japanese Restaurant | Japanese |
| 2 | 40210 | 51.221500 | 8.789191 | 4b448154f964a520bef525e3 | Kagaya | 51.221320 | 8.788232 | Japanese Restaurant | Japanese |
| 3 | 40210 | 51.221500 | 8.789191 | 5053698ce4b08e1d3c985b79 | Nagomi | 51.221913 | 8.788502 | Japanese Restaurant | Japanese |
| 4 | 40210 | 51.221500 | 8.789191 | 4b3be8f9f964a520207e25e3 | Takumi | 51.223429 | 8.788531 | Ramen Restaurant | Japanese |
| 21 | 40210 | 51.221500 | 8.789191 | 4b7e729cf964a52072ed2fe3 | Hyuga | 51.224525 | 8.789297 | Sushi Restaurant | Japanese |
| 24 | 40210 | 51.221500 | 8.789191 | 4f115acee4b09e81d8909f8a | Waraku | 51.223884 | 8.787538 | Japanese Restaurant | Japanese |
| 26 | 40210 | 51.221500 | 8.789191 | 53429155498e8dd5982f0e8e | Takezo Ramen Bar | 51.222817 | 8.790507 | Ramen Restaurant | Japanese |
| 27 | 40210 | 51.221500 | 8.789191 | 5b0c5e3a31ac8c002c8c3888 | Tonkatsu Gonta | 51.223490 | 8.788785 | Japanese Restaurant | Japanese |
| 32 | 40210 | 51.221500 | 8.789191 | 4bb84cb08edc78b092b7301c | Naniwa | 51.224915 | 8.788172 | Ramen Restaurant | Japanese |
| 34 | 40210 | 51.221500 | 8.789191 | 59da041146e1b64f7c9cbe9f | Takumi 3rd Tori & Veggie | 51.224532 | 8.788735 | Ramen Restaurant | Japanese |
| 36 | 40210 | 51.221500 | 8.789191 | 4b65c8a0f964a520f8fe2ae3 | Yabase | 51.224732 | 8.788833 | Japanese Restaurant | Japanese |
| 39 | 40210 | 51.221500 | 8.789191 | 4bc4a7d7f8219c74ee8b710 | Naniwa Sushi & More | 51.224845 | 8.788217 | Sushi Restaurant | Japanese |
| 42 | 40210 | 51.221500 | 8.789191 | 50cb1954e4b0e9d82c78c910 | Takumi Tonkotsu & Gyoza (焼地 二代目) (Takumi Ton... | 51.225223 | 8.788210 | Japanese Restaurant | Japanese |
| 45 | 40210 | 51.221500 | 8.789191 | 4bf178b45bfe0f47bdc0d838 | Soba-An | 51.224914 | 8.787977 | Soba Restaurant | Japanese |
| 48 | 40210 | 51.221500 | 8.789191 | 562e3587498e82a845809d9e | Maruyasu | 51.224577 | 8.788816 | Japanese Restaurant | Japanese |
| 57 | 40210 | 51.221500 | 8.789191 | 568ef0bd498e512b2db575c7 | Yaki The Emon 焼五衛門 | 51.224743 | 8.788877 | Japanese Restaurant | Japanese |
| 64 | 40210 | 51.221500 | 8.789191 | 4b4e2b8af964a520e0e328e3 | Nagaya | 51.225381 | 8.788098 | Japanese Restaurant | Japanese |
| 68 | 40210 | 51.221500 | 8.789191 | 585150337f8dd198f8e8f2e | eat Tokyo | 51.223135 | 8.790070 | Ramen Restaurant | Japanese |
| 69 | 40210 | 51.221500 | 8.789191 | 5810df5538faaa7ba8820c50 | Yoshi | 51.224217 | 8.785603 | Japanese Restaurant | Japanese |
| 70 | 40210 | 51.221500 | 8.789191 | 4c0d34d8c700c9b8950ea2dd | Fujiyama | 51.219727 | 8.784333 | Sushi Restaurant | Japanese |
| 74 | 40210 | 51.221500 | 8.789191 | 4cf014b4ed02721ed93884fd | Okinii | 51.223453 | 8.788300 | Japanese Restaurant | Japanese |
| 85 | 40210 | 51.221500 | 8.789191 | 5bbe4980bed483002c64a0f1 | Tokyo Ramen | 51.224120 | 8.787225 | Ramen Restaurant | Japanese |
| 104 | 40211 | 51.229510 | 8.789159 | 516080378aca1877ebad8170 | sumi. | 51.231848 | 8.792566 | Japanese Restaurant | Japanese |
| 118 | 40211 | 51.229510 | 8.789159 | 50cb1954e4b0e9d82c78c910 | Takumi Tonkotsu & Gyoza (焼地 二代目) (Takumi Ton... | 51.225223 | 8.788210 | Japanese Restaurant | Japanese |
| 367 | 40215 | 51.213835 | 8.784225 | 503541ffe4b0bd14213318db | Tokyo Lounge | 51.217971 | 8.782286 | Japanese Restaurant | Japanese |

4. Conclusion

- ▶ We recommend our client to open his 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 results