

A new restaurant in Zürich: preliminary studies

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In this report we present a preliminary study concerning the determination of the ideal location for the opening a new Italian restaurant in the city of Zürich. Insights on the problem are obtained by using data on the existing restaurants to identify the neighborhoods that should be take under consideration.

The business problem addressed in this report concerns the identification of a suitable location for the opening of a new Italian restaurant in the city of Zürich (CH). The client, who owns a chain of middle-high priced Italian restaurants operating in Italy, France and Germany, is planning to extend this business to Switzerland. Being that Zürich is the most densely populated town of the country, the city has been chosen for the pilot opening of the first restaurants. The city is well-known for having one of the highest quality of life in the world, which reflects in the food&services business in the constant increase offer and competition. This preliminary study aims at gaining a better quantitative understanding of present situation, by analysing the type and the geographic distribution of the already existing restaurants.

Data Sets

The primary source of data used for this analysis is the list of neighborhood of the city of Zürich, classified by name and postal code, <http://www.plz-suche.org/zuerich-ch7e45>.

As a second source of data, a Foursquare search is used to retrieve information about existing restaurants in each neighborhood.

Methodology

As a first step, we preprocess the neighborhood data by grouping neighborhoods which share the same postal code and we complement the data with the proper geolocalisation of each neighborhood. Additionally, since we consider a central location a key important factor for the success of the pilot opening, we discard neighborhoods whose distance from the city centre is bigger than 5 km. The resulting data set contains 21 locations and is shown in Fig. 1 and displayed on a map in Fig. 4. Next, we use the Foursquare API to collect, for each neighborhood a list of existing restaurants. Each venue is classified by: belonging neighborhood, venue name, type of cuisine and localisation.

This piece of information is subsequently used to build a data-frame where each neighborhood is classified base on the 10 most common type of cuisine that is served in the local restaurants. A sample of this data-frame is shown in Fig. 3.

The main tool used for analysis of this data frame is a k -means clustering algorithm with $k = 5$, which we use to cluster the neighborhoods of the city, according to the kind of restaurants they offer.

	PostalCode	Neighborhood	Latitude	Longitude
0	8001	City, Hochschulen, Lindenhof, Rathaus	47.372394	8.542333
1	8002	Enge	47.361789	8.528708
2	8003	Alt-Wiedikon, Sihlfeld	47.365562	8.517851
3	8004	Hard, Langstrasse, Werd	47.381743	8.512554
4	8005	Escher Wyss, Gewerbeschule	47.390899	8.515360
5	8006	Oberstrass, Unterstrass	47.385706	8.549124
6	8008	Mühlebach, Seefeld, Weinegg	47.255395	8.695773
7	8032	Hirslanden, Hottingen	47.362948	8.564269
8	8037	Wipkingen	47.393495	8.528602
9	8038	Wollishofen	47.342427	8.530708
10	8041	Leimbach	47.390254	8.581406
11	8044	Fluntern	47.376777	8.558775
12	8045	Friesenberg	47.354922	8.500523
13	8046	Affoltern	47.278247	8.452152
14	8047	Albisrieden	47.374857	8.484657
15	8048	Altstetten	47.387403	8.486061
16	8049	Höngg	47.401660	8.497715
17	8050	Oerlikon, Saaten	47.410421	8.544585
18	8051	Hirzenbach, Schwamendingen-Mitte	47.399697	8.588528
19	8052	Seebach	47.453721	8.895707
20	8053	Witikon	47.358310	8.590628

Fig. 1. Central neighborhoods of the city of Zürich.

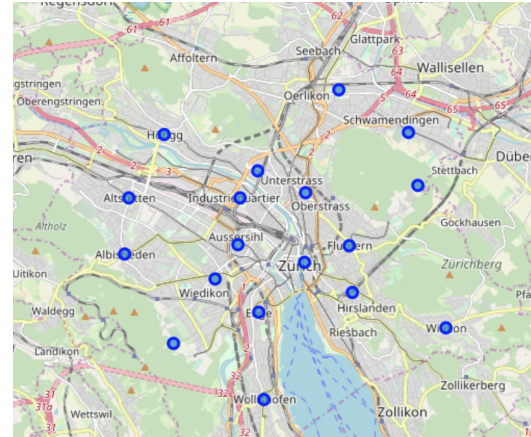


Fig. 2. Location of central neighborhoods of Zürich.

	Neighborhood	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue
0	Albisrieden	Swiss Restaurant	Restaurant	Italian Restaurant	Pizza Place	Breakfast Spot
1	Alt-Wiedikon, Sihlfeld	Café	Italian Restaurant	Pizza Place	Thai Restaurant	Asian Restaurant
2	Altstetten	Restaurant	Swiss Restaurant	Bakery	Pizza Place	Chinese Restaurant
3	City, Hochschulen, Lindenhof, Rathaus	Coffee Shop	Café	Italian Restaurant	Swiss Restaurant	Lounge
4	Enge	Italian Restaurant	Swiss Restaurant	French Restaurant	Asian Restaurant	Chinese Restaurant

Fig. 3. The most common types of cuisine served in Zürich.

	Neighborhood	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue
0	Albisrieden	Swiss Restaurant	Restaurant	Italian Restaurant	Pizza Place	Breakfast Spot
1	Alt-Wiedikon, Sihlfeld	Café	Italian Restaurant	Pizza Place	Thai Restaurant	Asian Restaurant
2	Altstetten	Restaurant	Swiss Restaurant	Bakery	Pizza Place	Chinese Restaurant
3	City, Hochschulen, Lindenhof, Rathaus	Coffee Shop	Café	Italian Restaurant	Swiss Restaurant	Lounge
4	Enge	Italian Restaurant	Swiss Restaurant	French Restaurant	Asian Restaurant	Chinese Restaurant

Fig. 4. Location of central neighborhoods of Zürich.

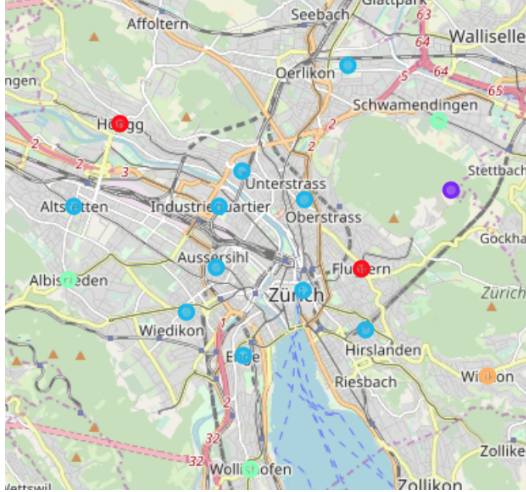


Fig. 5. Clustered neighborhoods of Zürich.

Results

The result of the clustering is shown graphically in Fig. 5. For the ease of discussion, we report in Fig. 6 and Fig. 7 the neighborhood belonging to the first and second most populated clusters, which correspond, respectively, to the blue and red dots of Fig. 5.

	Neighborhood	Cluster Labels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue
9	Wollishofen	3.0	Restaurant	Café	Bakery	Chinese Restaurant	Italian Restaurant
14	Albisrieden	3.0	Swiss Restaurant	Restaurant	Italian Restaurant	Pizza Place	Breakfast Spot
18	Hirzenbach, Schwamendingen-Mitte	3.0	Restaurant	Swiss Restaurant	Fast Food Restaurant	Pizza Place	Italian Restaurant

Fig. 6. First cluster.

Discussion

The inspection of the results, support quantitative the intuition that the farther a given neighborhood is from the city-centre, the lower is the density of restaurants, hinting to areas data offer less services for free-time and night life. Thus, the peripheral neighborhood, denoted in green, orange and purple in Fig. 5. Thus, these neighborhoods would should be considered for the opening of a new restaurants. Data confirm as well, the

	Neighborhood	Cluster Labels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue
0	City, Hochschulen, Lindenhof, Rathaus	2.0	Coffee Shop	Café	Italian Restaurant	Swiss Restaurant	Lounge
1	Enge	2.0	Italian Restaurant	Swiss Restaurant	French Restaurant	Asian Restaurant	Chinese Restaurant
2	Alt-Wiedikon, Sihlfeld	2.0	Café	Italian Restaurant	Pizza Place	Thai Restaurant	Asian Restaurant
3	Hard, Langstrasse, Werd	2.0	Café	Thai Restaurant	Restaurant	Japanese Restaurant	Bakery
4	Escher Wyss, Gewerbeschule	2.0	Restaurant	Café	Burger Joint	Ice Cream Shop	Falafel Restaurant
5	Oberstrass, Unterstrass	2.0	Italian Restaurant	Swiss Restaurant	Café	Restaurant	Thai Restaurant
7	Hirslanden, Hottingen	2.0	Italian Restaurant	Swiss Restaurant	Café	Bakery	Restaurant
8	Wipkingen	2.0	Italian Restaurant	Restaurant	Bakery	Café	Eastern European Restaurant
15	Altstetten	2.0	Restaurant	Swiss Restaurant	Bakery	Pizza Place	Chinese Restaurant
17	Oerlikon, Saathen	2.0	Café	Italian Restaurant	Restaurant	Thai Restaurant	Swiss Restaurant

Fig. 7. Second cluster.

central neighborhoods offer the highest number of restaurants,

hinting to big demand for food-related service. However, it is particularly interesting to observe that the most central neighborhoods, which belong to the first cluster in 6, have an extremely high density of Italian restaurants, which might constitute a dangerous source of competition. Therefore, the decision to open a new Italian restaurant in these areas, should be taken only after further analysis aiming at the quantitative study both of demand and competitors. Finally, the data analysis reveals the neighborhoods Wollishofen, Albisrieden and Hirzenbach/Schwamendingen-Mitte, which form the second cluster, given in Fig. 7, share both a relatively central location, as well a lower competitiveness from existing Italian restaurants. A further study of these neighborhoods could reveal them as the ideal places for the pilot opening.

However

Conclusions

In this report we conducted an exploratory analysis towards the determination of the optimal location for the opening the client's first Italian restaurant in Zürich. As a result, we have identified four neighborhoods which should be excluded, as they too peripheral and seem more attractive for Fast Foods and Café-like activities rather than restaurants. Within the city centre, we have observed a very high density of existing Italian restaurants that hints, at the same time to a high demand for the type of cuisine offered by the client, but also to very high competition. In addition, the data seems to suggest that the neighborhoods Wollishofen, Albisrieden and Hirzenbach/Schwamendingen-Mitte, situated right next to the city centre, should be studied with more attention. In fact, since they show a high density of restaurants but a relatively low presence of Italian restaurants, they could offer a perfect location for a successful pilot-opening.