Coursera final report

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1 Introduction

Our aim is to open a yoga studio or gym in Zurich, Switzerland. The layout of the city in Zurich is complicated by a lot of water bodies (rivers and the lake) and two hills flanking the city. So not all parts of town are equally easy to access.

We want to determine two things:

- In which parts of town (Neighbourhoods) do a lot of people live, but we have very few existing gyms?

- As inhabitants are not the only thing to consider (e.g., where are business centers), where are a lot of established gyms (a sign of people wanting to work out here), but not a lot of yoga studios (maybe a newer kind of venue)?

Our target group is someone looking to open a yoga studio.

2 Data

We will use the following main data sources:

- Wikipedia, to determine scrape the boroughs of Zurich, their neighbourhood and further data.

- Spatial data of the city of Zurich, provided by the statistical office of the city of Zurich. This contains further information of the individual neighbourhoods, such as the polygon data of the neighbourhood.

- Foursquare data of different venues is collected, mainly of gym and yoga studio venues.

3 Methodology

We start by sourcing the wikipedia data for Zurich with beautifulsoup. We need to deal with nested tables, sigils etc., which complicates obtaining this information.

Statistical and spatial data for Zurich can be loaded from shape files provided by the city of Zurich. Next, the coordinate system needs to be changed to the appropriate geodetic coordinate system. We can use geopy, geopandas and geojson to achieve this. Once completed, we the neighbourhoods can be plotted with their appropriate boundaries and the neighbourhood centers can be computed from the boundary data.

Foursquare can be used to obtain the venue locations of gyms and yoga studios. As we have the neighbourhood borders, we can then check for each venue associated to a neighbourhood (based on a radius around the centroid), if the venue is actually in the neighbourhood. This allows to clean up the city data and properly allocate venues to their neighbourhood.

From there, we can plot the venues in their neighbourhoods and also count how many venues are located in each neighbourhood.

4 Results

All neighbourhoods are shown in Figure 1. Neighbourhood boundaries in the city are shown with blue lines, based on the polygon data provided by the statistical office of Zurich. As would be expected, gym and yoga locations are mainly located in the center of the city. However, there are other agglomerations of venues around town, located near business centers. These smaller assortments of numerous gyms are mostly void of yoga studio locations. While these centers indicate a demand for sport by people living or working nearby, these clusters of gyms possible indicate an opportunity to open a yoga studio.

When looking at the neighbourhood data for gyms per capita (Figure 2), it is apparent that most neighbourhoods with a high number of inhabitants per gyms are found in the suburbs of Zurich. However, Figure 2 shows that a few neighbourhoods are particularly void of opportunities to work out or be active. Among the top neighbourhoods, especially Sihlfeld is interesting, as it is very centrally located, but almost totally void of any gym venues. So it appears to be the primary neighbourhood to investigate when looking for a new location to open a gym in.

Yoga studios are naturally a bit more niche than gyms, and their inhabitant per yoga studio ratio is shown in Figure 3. Interestingly, the top three neighbourhoods (when looking at opening a gym) have a significantly higher ratio of inhabitants to yoga studios, than for gyms. This seems to indicate that these neighbourhoods do have significantly more gym venues to satisfy the desire by the inhabitants to work out or exercise. Therefore, they seem particularly suitable to open a yoga studio, as there is evidence that the local population does use exercise venues.
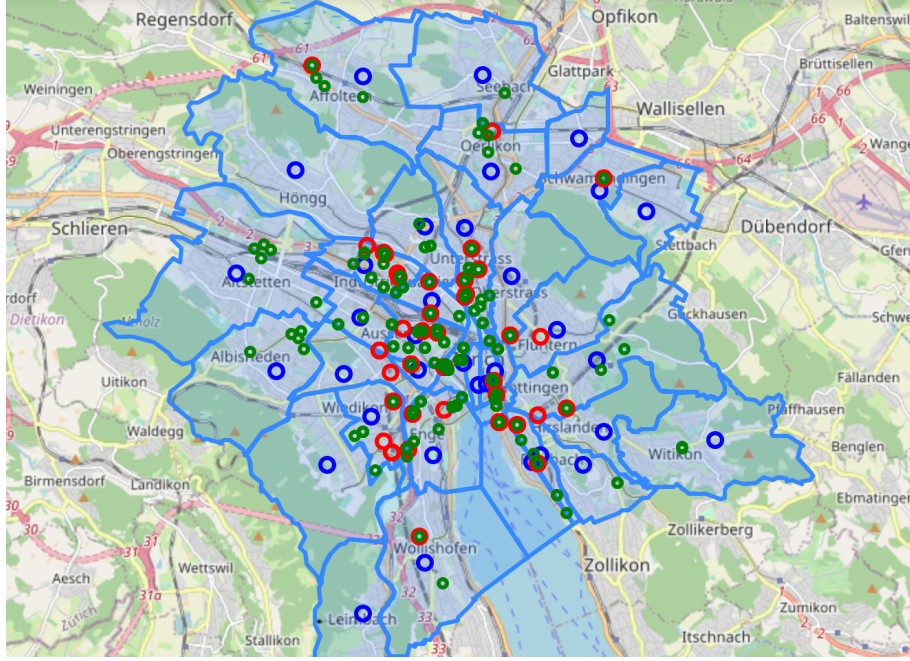
Figure 1: A map of Zurich. Neighbourhoods are bounded by blue lines, with their center marked by blue markers. Gym locations are marked with green markers, while yoga studio locations are marked with red markers.

Based on these findings, the top location to open a gym seems to be Sihlfeld, while the top locations to open a yoga studio are Affoltern, Oerlikon and Wollishofen.

5   Discussion

Naturally, other data would have to be taken into consideration, such as public transport routes or business centers. There could be room for market research, whether people are particularly partial to working out at a gym near their work in comparison to yoga. There could be a discrepancy here.

6   Conclusion

Wikipedia data, further statistical data from the city of Zurich and foursquare data are used to put this analysis together. The existing data is used to add precision to the allocation of venues to neighbourhoods. The polygon data can be used to ensure that venues are actually located in the neighbourhood they are found for. Based on these findings, the top location to open a gym seems to

Quartier	Venue_yoga	Venue_gym	Gym/Yoga	Inhabitants (2018)	pp_yoga	pp_gym
Sihlfeld	2	1	0.50	21680	10840.0	21680.0
Hirzenbach	1	1	1.00	12801	12801.0	12801.0
Schwamendingen-Mitte	1	1	1.00	11100	11100.0	11100.0
Wollishofen	1	2	2.00	18923	18923.0	9461.5
Saatlen	1	1	1.00	8582	8582.0	8582.0
Affoltern	1	4	4.00	26562	26562.0	6640.5
Unterstrass	3	4	1.33	23394	7798.0	5848.5
Oerlikon	1	5	5.00	23214	23214.0	4642.8
Fluntern	2	2	1.00	8485	4242.5	4242.5
Hirslanden	1	2	2.00	7488	7488.0	3744.0
Wipkingen	3	5	1.67	16321	5440.3	3264.2
Alt-Wiedikon	3	7	2.33	17956	5985.3	2565.1
Hard	2	9	4.50	13163	6581.5	1462.6
Enge	5	7	1.40	9634	1926.8	1376.3

Figure 2: Zurich neighbourhoods, sorted by the number of inhabitants per gym.

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