

Report

Prospects of a Coffee Shop in Zurich, Switzerland

REPORT

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1. Introduction

Switzerland is among the top countries in the world when it comes to the consumption of coffee in the world (per capita), which makes it one of its most business oriented cities, Zurich, a good place to start a coffee shop business.

Mean (± SD) daily caffeine consumption per person and percentile 95 are 191 mg/day (± 129) and 426 mg/day, respectively. The three main sources of caffeine intake are 1) coffee (83% of total caffeine intake), 2) tea (9%) and 3) soft drinks (4%). Caffeine consumption seems to be highest between 06:00 and 09:00 (29%) (Rochat et al, 2019).

1.1. TARGET CLIENT

Entrepreneurs who want to invest or start a coffee shop. This analysis will be a comprehensive guide to select the location for opening a coffee shop in Zurich.

2. Data

2.1 Scraping Zurich Table from Wikipedia

I obtained the data about Zurich neighbourhoods by scrapping it from https://en.wikipedia.org/wiki/Subdivisions_of_Z%C3%BCrich. For this, I've used requests and Beautifulsoup4 library to create a data-frame containing districts in Zurich with their neighbourhoods and zip codes.

```
from bs4 import BeautifulSoup
import requests

saving wikipedia page into soup variable for parsing

import urllib.request
with urllib.request.urlopen(url) as html_file:
    soup = BeautifulSoup(html_file, 'lxml')

table = soup.find('table', {"cellspacing":"0"})
columnnames = []

#table = soup.table
columns = table.findAll('th')
header = []
for column in columns:
    header.append(column.text.rstrip("\n"))
header
```

After some manipulations, the resulting data frame contains District, Neighborhood and BFS-code and looks like follows:

new_df.head()										
	District	Neighborhood	BFS-Code							
1	District 2	Wollishofen	261021							
2	District 2	Leimbach	261023							
3	District 2	Enge	261024							
5	District 3Wiedikon	Alt-Wiedikon	261031							
6	District 3Wiedikon	Friesenberg	261033							

2.2. Obtaining geographical coordinates for each neighbourhood

I used **geopy** geocoding library to obtain geographical coordinates of each neighbourhood. The resulting dataframe has the following structure:

	District	Latitude	Longitude	Neighborhood
0	District 2	47.342427	8.530708	Wollishofen
1	District 2	47.398196	8.587829	Leimbach
2	District 2	47.361789	8.528708	Enge
3	District 3Wiedikon	47.365562	8.517851	Alt-Wiedikon
4	District 3Wiedikon	47.354922	8.500523	Friesenberg

2.3 Using Foursquare data to return the list of venues

I used the geographical coordinates of each neighbourhood to pass them to the Foursquare API. This returned a list of top 100 venues in the neighbourhood within a radius of 500 m.

The call returned a JSON file, which I then transformed into pandas dataframe.

1]:		t(zurich_ve .ch_venues.	enues.shape) head(10)					
	(797	7, 7)						
1]:	N	eighborhood	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
	0	Wollishofen	47.342427	8.530708	Restaurant Bürgli	47.343048	8.533720	Restaurant
	1	Wollishofen	47.342427	8.530708	Chäs und Brot	47.344292	8.529974	Cheese Shop
	2	Wollishofen	47.342427	8.530708	Rote Fabrik	47.343607	8.536923	Music Venue
	3	Wollishofen	47.342427	8.530708	Shamrock	47.338950	8.530323	Irish Pub
	4	Wollishofen	47.342427	8.530708	Ziegel oh Lac	47.343652	8.536766	Swiss Restaurant
	5	Wollishofen	47.342427	8.530708	Coop	47.340108	8.530221	Supermarket
	6	Wollishofen	47.342427	8.530708	Migros	47.344557	8.529905	Supermarket
	7	Wollishofen	47.342427	8.530708	VBZ Butzenstrasse	47.340136	8.530211	Tram Station
	8	Wollishofen	47.342427	8.530708	VBZ Rote Fabrik	47.342868	8.536043	Bus Station
	9	Wollishofen	47.342427	8.530708	VBZ Wollishofen	47.338576	8.530693	Tram Station

3. Methodology

3.1. EXPLORE DATA

First, I used explored neighbourhoods in Zurich and found the nearby venues per each neighbourhood.

	name	categories	lat	Ing
0	Restaurant Hopfenau	Restaurant	47.365205	8.519986
1	Napoli da Gerardo	Italian Restaurant	47.366278	8.521113
2	Maison Manesse	Restaurant	47.365071	8.521433
3	Ploy Thai	Thai Restaurant	47.363977	8.520310
4	Mezzo	Pizza Place	47.362715	8.518926
5	smith and the luma	Diner	47.361573	8.515007
6	Bäckerei Buchmann	Bakery	47.362525	8.518672
7	Zapote	Burrito Place	47.363327	8.517523
8	Daizy	Lounge	47.363123	8.512375
9	Spielplatz Kollerwiese	Playground	47.368398	8.519001
10	Chez Nhan	Vietnamese Restaurant	47.369957	8.518591
11	Binz & Kunz	Beer Garden	47.362899	8.513159
12	Daizy	Restaurant	47.363551	8.512763
13	Restaurant Vietnam	Asian Restaurant	47.362323	8.518556
14	Barkat Cash & Carry	Farmers Market	47.369735	8.520106
15	Ristorante Verona	Italian Restaurant	47.364187	8.520588
16	Restaurant Vereinigung	Tapas Restaurant	47.363006	8.522282
17	Lidl	Supermarket	47.361778	8.514692
18	Wiedikon Point	Fast Food Restaurant	47.369267	8.520663
19	zurlinden 21 restaurant	Gastropub	47.368175	8.522097
20	SZU Zürich Friesenberg	Light Rail Station	47.366173	8.511390

Then checked how many venues were returned per each neighbourhood.

3.2 PREPARING DATA SET FOR ANALYSIS

I prepared the data set for analysis by using one-hot encoding method and then grouped them by neighbourhood. [55]: # add clustering labels neighborhoods_venues_sorted.insert(0, 'Cluster Labels', kmeans.labels_) zurich_merged = df_final # merge toronto_grouped with toronto_data to add latitude/longitude for each neighborhood
zurich_merged = zurich_merged.join(neighborhoods_venues_sorted.set_index('Neighborhood'), on='Neighborhood') zurich_merged.head() # check the last columns! 4th Most Common 9th Most [55]: 1st Most 2nd Most 3rd Most 5th Most 6th Most 7th Most 8th Most District Latitude Longitude Neighborhood Cluster Labels Common Common Venue Common Common Venue Common Venue Common Venue Common Venue Common Venue Venue Venue Venue Tram Station Bus Station Cheese Shop Swiss 0 District 2 47.342427 8.530708 Wollishofen Supermarket Plaza Irish Pub Restaurant Music Venue Restaurant Tram Station Steakhouse Italian Restaurant Food Court 1 District 2 47.398196 8.587829 Food Truck Italian History 2 District 2 47.361789 8.528708 Enge Bar Hotel Plaza Supermarket

Italian

Restaurant Restaurant

1 Restaurant

3 Stables Tennis Court

3 District 47.365562 8.517851

4 District 3Wiedikon 47.354922 8.500523

Alt-Wiedikon

Friesenberg

Restaurant

Thai

Farmers

Market

Museum

Lounge

Food

Burrito

Place

Food

Court

Station

Beer Garden

Flea F Market Re

Restaurant

Farmers Market

Supermarket

Food Flower Shop

Fast Food

Restaurant

Drink Shop

Food &

	Neighborhood	Accessories Store	American Restaurant	Argentinian Restaurant	Art Gallery	Art Museum	Arts & Crafts Store	Asian Restaurant	Automotive Shop	BBQ Joint	 Trail	Train Station	Tram Station	Tratt
0	Affoltern	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	 0.000000	0.000000	0.000000	
1	Albisrieden	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	 0.000000	0.000000	0.000000	
2	Alt-Wiedikon	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.047619	0.000000	0.000000	 0.000000	0.000000	0.000000	
3	Altstetten	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.034483	0.000000	0.000000	 0.000000	0.000000	0.000000	
4	Enge	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	 0.000000	0.028571	0.057143	
5	Escher Wyss	0.000000	0.000000	0.000000	0.000000	0.029412	0.000000	0.000000	0.014706	0.000000	 0.014706	0.000000	0.029412	
6	Fluntern	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	 0.000000	0.000000	0.230769	
7	Friesenberg	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	 0.000000	0.000000	0.000000	
8	Gewerbeschule	0.017857	0.000000	0.000000	0.017857	0.000000	0.000000	0.053571	0.000000	0.017857	 0.000000	0.000000	0.000000	
9	Hard	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	 0.000000	0.000000	0.000000	
10	Hirslanden	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	 0.000000	0.000000	0.235294	
11	Hirzenbach	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	 0.000000	0.000000	0.000000	
12	Hottingen	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	 0.000000	0.000000	0.083333	
13	Höngg	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	 0.000000	0.000000	0.076923	
14	Langstrasse	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.010000	0.000000	0.000000	 0.000000	0.000000	0.000000	
15	Leimbach	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	 0.000000	0.000000	0.500000	
16	Mühlebach	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	 0.000000	0.200000	0.000000	
17	Oberstrass	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.041667	0.000000	0.000000	 0.000000	0.000000	0.125000	
18	Oerlikon	0.000000	0.019608	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	 0.000000	0.019608	0.039216	

I then created a dataframe, listing top 10 venues per neighbourhood:

```
import numpy as np
num_top_venues = 10

indicators = ['st', 'nd', 'rd']

# create columns according to number of top venues
columns = ['Neighborhood']
for ind in np.arange(num_top_venues):
    try:
        columns.append('{}{} Most Common Venue'.format(ind+1, indicators[ind]))
    except:
        columns.append('{}th Most Common Venue'.format(ind+1))

# create a new dataframe
neighborhoods_venues_sorted = pd.DataFrame(columns=columns)
neighborhoods_venues_sorted['Neighborhood'] = zurich_grouped['Neighborhood']

for ind in np.arange(zurich_grouped.shape[0]):
    neighborhoods_venues_sorted.iloc[ind, 1:] = return_most_common_venues(zurich_grouped.iloc[ind, :], num_top_venues)
neighborhoods_venues_sorted.head(20)
```

	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 Affoltern	Bar	Grocery Store	Lounge	Stadium	Discount Store	Flea Market	French Restaurant	Food Truck	Food Court	Food & Drink Shop
	1 Albisrieden	Swiss Restaurant	Grocery Store	Supermarket	Trattoria/Osteria	Restaurant	Bakery	Scenic Lookout	Falafel Restaurant	Food & Drink Shop	Food
	2 Alt-Wiedikon	Restaurant	Italian Restaurant	Thai Restaurant	Lounge	Burrito Place	Fast Food Restaurant	Farmers Market	Supermarket	Beer Garden	Gastropub
	3 Altstetten	Supermarket	Bakery	Bus Station	Chinese Restaurant	Plaza	Café	Sandwich Place	Pool	Paper / Office Supplies Store	Fast Food Restaurant
	4 Enge	Bar	Hotel	Italian Restaurant	History Museum	Plaza	Supermarket	Swiss Restaurant	Café	Tram Station	Train Station
	5 Escher Wyss	Café	Restaurant	Hotel	Bar	Nightclub	Italian Restaurant	Concert Hall	Art Museum	Falafel Restaurant	Park
	6 Fluntern	Tram Station	Bakery	Grocery Store	Indie Movie Theater	Café	Bus Station	Supermarket	Gastropub	Pizza Place	Gym Pool
	7 Friesenberg	Stables	Tennis Court	Farmers Market	Food Truck	Food Court	Food & Drink Shop	Food	Flower Shop	Flea Market	Fast Food Restaurant
	8 Gewerbeschule	Bar	Asian Restaurant	Café	Italian Restaurant	Vietnamese Restaurant	Sandwich Place	Restaurant	Swiss Restaurant	Thai Restaurant	Yoga Studio
	9 Hard	Hotel	Swiss Restaurant	Mediterranean Restaurant	Café	Supermarket	Plaza	Furniture / Home Store	Italian Restaurant	Liquor Store	Park
1	0 Hirslanden	Tram Station	Plaza	Park	Italian Restaurant	Steakhouse	Swiss Restaurant	Tailor Shop	Mediterranean Restaurant	Bakery	Bus Station
	11 Hirzenbach	Pizza Place	Supermarket	Furniture / Home Store	Sporting Goods Shop	Clothing Store	Yoga Studio	Farmers Market	Food & Drink Shop	Food	Flower Shop

3.3 CLUSTERING NEIGHBOURHOODS INTO GROUPS BY VENUE TYPE

I used k-means clustering on the neighbourhood venues data to cluster them based on the similarities of venue categories, selecting "5" as the number of clusters.

This is the code that was used for clustering:

```
# set number of clusters
kclusters = 5

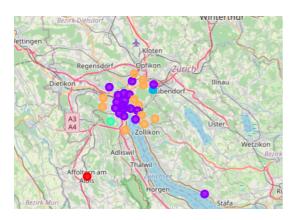
zurich_grouped_clustering = zurich_grouped.drop('Neighborhood', 1)

# run k-means clustering
kmeans = KMeans(n_clusters=kclusters, random_state=0).fit(zurich_grouped_clustering)

# check cluster labels generated for each row in the dataframe
kmeans.labels_[0:10]

array([0, 4, 1, 4, 1, 1, 4, 3, 1, 1], dtype=int32)
```

3. 4 VISUALISATION



I used leaflet map using Folium library to show the clusters in the leaflet map as below. Legend: red - Cluster 0, purple -Cluster 1, yellow - Cluster 4, blue - Cluster 2, green - Cluster 3

Cluster 0

zurich_merged.	<pre>zurich_merged.loc[zurich_merged('Cluster Labels'] == 0, zurich_merged.columns[[1] + list(range(5, zurich_merged.shape[1]))]]</pre>													
Latitude	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				
24 47.278247	Bar	Grocery Store	Lounge	Stadium	Discount Store	Flea Market	French Restaurant	Food Truck	Food Court	Food & Drink Shop				

Cluster 1

zurich_merged.loc[zurich_merged['Cluster Labels'] == 1, zurich_merged.columns[[1] + list(range(5, zurich_merged.shape[1]))]]

Latitu	1st Most	2nd Most								
	ude Common Venue	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
2 47.3617	789 Bar	Hotel	Italian Restaurant	History Museum	Plaza	Supermarket	Swiss Restaurant	Café	Tram Station	Train Station
3 47.3655	Restaurant	Italian Restaurant	Thai Restaurant	Lounge	Burrito Place	Fast Food Restaurant	Farmers Market	Supermarket	Beer Garden	Gastropub
5 47.373	218 Café	Italian Restaurant	Bar	Plaza	Ethiopian Restaurant	Supermarket	Tapas Restaurant	Event Space	Creperie	Coffee Shop
6 47.371	991 Bar	Swiss Restaurant	Italian Restaurant	Bakery	Sushi Restaurant	Coffee Shop	Restaurant	Thai Restaurant	Gym	Museum
7 47.3772	273 Bar	Italian Restaurant	Swiss Restaurant	Restaurant	Chinese Restaurant	Mediterranean Restaurant	Thai Restaurant	Japanese Restaurant	Nightclub	Vegetarian / Vegan Restaurant
8 47.381	743 Hotel	Swiss Restaurant	Mediterranean Restaurant	Café	Supermarket	Plaza	Furniture / Home Store	Italian Restaurant	Liquor Store	Park
9 47.383	818 Bar	Asian Restaurant	Café	Italian Restaurant	Vietnamese Restaurant	Sandwich Place	Restaurant	Swiss Restaurant	Thai Restaurant	Yoga Studio
10 47.3908	399 Café	Restaurant	Hotel	Bar	Nightclub	Italian Restaurant	Concert Hall	Art Museum	Falafel Restaurant	Park
11 47.3914	147 Italian Restaurant	Pizza Place	Middle Eastern Restaurant	Café	Bakery	Hotel	Kids Store	Park	Falafel Restaurant	Food & Drink Shop
14 47.3696	680 Hotel	Swiss Restaurant	Tram Station	Plaza	Italian Restaurant	Grocery Store	Coffee Shop	Korean Restaurant	College Cafeteria	Bakery
17 47.3577	783 Italian Restaurant	Hotel	Art Museum	Restaurant	Swiss Restaurant	Salad Place	Café	Bakery	Park	Supermarket
18 47.2543	Bakery	Movie Theater	Swiss Restaurant	Train Station	Grocery Store	Farmers Market	Food Court	Food & Drink Shop	Food	Flower Shop

Cluster 2

]: zurich_merged.loc[zurich_merged['Cluster Labels'] == 2, zurich_merged.columns[[1] + list(range(5, zurich_merged.shape[1]))]]

]:	Latitude	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
	1 47.398196	Tram Station	Steakhouse	Italian Restaurant	Farmers Market	French Restaurant	Food Truck	Food Court	Food & Drink Shop	Food	Flower Shop

Cluster 3

]: zurich_merged.loc[zurich_merged['Cluster Labels'] == 3, zurich_merged.columns[[1] + list(range(5, zurich_merged.shape[1]))]]

]:	Latitude	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
	4 47.354922	Stables	Tennis Court	Farmers Market	Food Truck	Food Court	Food & Drink Shop	Food	Flower Shop	Flea Market	Fast Food Restaurant

Cluster 4

zurich_merged.loc[zurich_merged['Cluster Labels'] == 4, zurich_merged.columns[[1] + list(range(5, zurich_merged.shape[1]))]]

	Latitude	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	47.342427	Tram Station	Supermarket	Plaza	Irish Pub	Restaurant	Swiss Restaurant	Bus Station	Music Venue	Cheese Shop	Yoga Studio
12	47.385706	Tram Station	Hotel	Bakery	Bus Station	Supermarket	Swiss Restaurant	Italian Restaurant	Park	College Academic Building	Restaurant
13	47.376777	Tram Station	Bakery	Grocery Store	Indie Movie Theater	Café	Bus Station	Supermarket	Gastropub	Pizza Place	Gym Pool
15	47.362948	Tram Station	Plaza	Park	Italian Restaurant	Steakhouse	Swiss Restaurant	Tailor Shop	Mediterranean Restaurant	Bakery	Bus Station
16	47.358310	Bus Station	Tram Station	Supermarket	Church	Grocery Store	Bakery	Optical Shop	Department Store	Indian Restaurant	Ethiopian Restaurant
19	47.351058	Bus Station	Modern European Restaurant	Restaurant	Swiss Restaurant	Fast Food Restaurant	Food Truck	Food Court	Food & Drink Shop	Food	Flower Shop
20	47.374857	Swiss Restaurant	Grocery Store	Supermarket	Trattoria/Osteria	Restaurant	Bakery	Scenic Lookout	Falafel Restaurant	Food & Drink Shop	Food
21	47.387403	Supermarket	Bakery	Bus Station	Chinese Restaurant	Plaza	Café	Sandwich Place	Pool	Paper / Office Supplies Store	Fast Food Restaurant
26	47.420438	Hookah Bar	Pool	Grocery Store	Bus Station	Supermarket	Laser Tag	Korean Restaurant	Bakery	Plaza	Gym / Fitness Center
27	47.412637	Supermarket	Gastropub	Kebab Restaurant	Bus Station	Yoga Studio	Fast Food Restaurant	Food Truck	Food Court	Food & Drink Shop	Food
28	47.404437	Bus Station	Plaza	Restaurant	Camera Store	Shopping Mall	Light Rail Station	Supermarket	Swiss Restaurant	Miscellaneous Shop	Fast Food Restaurant

4. Results

Throughout the analysis, I have identified 5 major clusters in the city of Zurich. The goal of this project was to identify the feasibility of opening a coffee shop in Zurich, and map possible locations where it would be preferable to open it.

I have found out that:

- Bars and cafes are the most popular venues in the central neighbourhoods. The next popular are Italian restaurants.
- Haang, Oerlikon, Wipkingen, Escher Wiss, Gewerbeschule, Understass, Hard, Sihfeld, Alt-Wiedikon, Enge, Seefeld, Werd are dominated by bars, cafes and restaurants as most common venues.
- Schwamendingen Mitte, Saatlen, Seebach, Altstetten, Albisrieden,
 Oberstrass, Fluntern, Hirslanden, Witikon, Weinegg, Wollishofen are dominated by Tram stations, bus stations and supermarkets.
- Leimbach is dominated by tram stations, steakhouses and Italian restaurants.
- For Friesenberg the most common venues are stables, tennis court and farmers market.

5. Discussion

Based on these results, I am considering the following neighbourhoods as most interesting to be considered for coffee shop opening: Haang, Oerlikon, Wipkingen, Escher Wiss, Gewerbeschule, Understass, Hard, Sihfeld, Alt-

Wiedikon, Enge, Seefeld, Werd, the neighbourhoods where the most popular venues are bars, cafes and restaurants.

Coffee shops per se are quite rare in these areas, so one might consider it is good business opportunity, especially if the coffee shop can be made to provide for some snacks and accommodate lunch eaters.

Another opportunity could be using cluster area 4 (Schwamendingen Mitte, Saatlen, Seebach, Altstetten, Albisrieden, Oberstrass, Fluntern, Hirslanden, Witikon, Weinegg, Wollishofen are dominated), to have simple coffee pit-stops open between 6 and 9 o'clock in the morning.

6. Conclusion

For client considering opening coffee shop in Zurich, the recommended areas are Haang, Oerlikon, Wipkingen, Escher Wiss, Gewerbeschule, Understass, Hard, Sihfeld, Alt-Wiedikon, Enge, Seefeld, Werd.

Ideas for further analysis:

- Clustering these selected areas based on the categories of venues to see where the completion is less.
- Make sure that Foursquare is a good source of information for the European market, especially for non-English speaking country. One might want to check the data obtained in this report against data from Tripadvisor or other rating systems, including Facebook business pages etc.