

# Final

June 2, 2020

```
[1]: import numpy as np

import pandas as pd
pd.set_option('display.max_columns', None)
pd.set_option('display.max_rows', None)

import json
!conda install -c conda-forge geopy --yes
from geopy.geocoders import Nominatim

import requests
from pandas.io.json import json_normalize

import matplotlib.cm as cm
import matplotlib.colors as colors

from sklearn.cluster import KMeans

import folium

print('Libraries imported.')
```

```
Collecting package metadata (current_repodata.json): done
Solving environment: done
```

```
# All requested packages already installed.
```

```
Libraries imported.
```

```
[2]: df = pd.read_excel ('Data for Capstone.xlsx')
df.head()
```

```
[2]:
```

	City	Zip Code	Longitude	Latitude
0	Zürich	8001	8.530807	47.382824
1	Zürich	8002	8.539550	47.377060
2	Zürich	8003	8.539550	47.377060
3	Zürich	8004	8.530807	47.382824
4	Zürich	8005	8.530807	47.382824

```
[3]: CLIENT_ID = 'RLM401CAFIWXLU00LBV2Z33DT45BIULLHUNEYKM4LMR02VUK' # your ↵
      ↪Foursquare ID
      CLIENT_SECRET = 'D5G4H1H3PSWZTTTET3IA05P55H4CJ2X4XWTIKLTBU11QBHQB' # your ↵
      ↪Foursquare Secret
      VERSION = '20180605' # Foursquare API version
      LIMIT = 100
      print('Your credentails:')
      print('CLIENT_ID: ' + CLIENT_ID)
      print('CLIENT_SECRET:' + CLIENT_SECRET)
```

Your credentails:

CLIENT\_ID: RLM401CAFIWXLU00LBV2Z33DT45BIULLHUNEYKM4LMR02VUK

CLIENT\_SECRET:D5G4H1H3PSWZTTTET3IA05P55H4CJ2X4XWTIKLTBU11QBHQB

```
[4]: search_query = 'Food'
      radius = 1000
      print(search_query + ' .... OK!')
```

Food ... OK!

```
[5]: # KREIS1
      latitude = 47.370278
      longitude = 8.541667
      url = 'https://api.foursquare.com/v2/venues/search?
      ↪client_id={} & client_secret={} & ll={}, {} & v={} & query={} & radius={} & limit={} '.
      ↪format(CLIENT_ID, CLIENT_SECRET, latitude, longitude, VERSION, search_query, ↵
      ↪radius, LIMIT)
      url
```

```
[5]: 'https://api.foursquare.com/v2/venues/search?client_id=RLM401CAFIWXLU00LBV2Z33DT
      45BIULLHUNEYKM4LMR02VUK&client_secret=D5G4H1H3PSWZTTTET3IA05P55H4CJ2X4XWTIKLTBU1
      1QBHQB&ll=47.370278,8.541667&v=20180605&query=Food&radius=1000&limit=100'
```

```
[6]: results = requests.get(url).json()
```

```
[7]: # assign relevant part of JSON to venues
      venues = results['response']['venues']

      # transform venues into a dataframe
      dataframe = json_normalize(venues)
      dataframe.head()
```

```
/home/jupyterlab/conda/envs/python/lib/python3.6/site-
packages/ipykernel_launcher.py:5: FutureWarning: pandas.io.json.json_normalize
is deprecated, use pandas.json_normalize instead
"""
```

```

[7]:
      id
0 560595f7498eb0f06171956e Food from Farmers
1 5357cc16498e0e40db63f54a Jelmoli Food Market
2 4e87185182316be403a7f640 Hong-Kong Food Paradise
3 5bac7c428b98fd0039448a15 Food Station
4 5cc1c6a4cabcff002ce22ad4 Coop Supermarkt City Zürich St. Annahof Food

      categories referralId hasPerk \
0 [{ 'id': '4bf58dd8d48988d16c941735', 'name': 'B... v-1591131861 False
1 [{ 'id': '50be8ee891d4fa8dcc7199a7', 'name': 'M... v-1591131861 False
2 [{ 'id': '4bf58dd8d48988d145941735', 'name': 'C... v-1591131861 False
3 [{ 'id': '4bf58dd8d48988d120951735', 'name': 'F... v-1591131861 False
4 [] v-1591131861 False

      location.address location.crossStreet location.lat location.lng \
0 Langstrasse 211 Josefstrasse 47.368502 8.545671
1 NaN NaN 47.374083 8.537229
2 Seidengasse 1 NaN 47.374042 8.536562
3 Bahnhofplatz 15 NaN 47.378204 8.535982
4 Bahnhofstrasse 57 NaN 47.372902 8.538024

      location.labeledLatLngs location.distance \
0 [{ 'label': 'display', 'lat': 47.36850193220842... 360
1 [{ 'label': 'display', 'lat': 47.3740827107709,... 539
2 [{ 'label': 'display', 'lat': 47.37404169003569... 568
3 [{ 'label': 'display', 'lat': 47.378204, 'lng':... 980
4 [{ 'label': 'display', 'lat': 47.37290177, 'lng... 400

      location.postalCode location.cc location.city location.state \
0 8005 CH Zürich Zürich
1 NaN CH NaN NaN
2 8001 CH Zürich Zürich
3 NaN CH NaN NaN
4 8001 CH Zürich Zürich

      location.country location.formattedAddress \
0 Schweiz [Langstrasse 211 (Josefstrasse), 8005 Zürich, ...
1 Schweiz [Schweiz]
2 Schweiz [Seidengasse 1, 8001 Zürich, Schweiz]
3 Schweiz [Bahnhofplatz 15, Schweiz]
4 Schweiz [Bahnhofstrasse 57, 8001 Zürich, Schweiz]

      venuePage.id location.neighborhood
0 NaN NaN
1 NaN NaN
2 NaN NaN
3 NaN NaN

```

```
[8]: # keep only columns that include venue name, and anything that is associated
      ↪with location
      filtered_columns = ['name', 'categories'] + [col for col in dataframe.columns
      ↪if col.startswith('location.')] + ['id']
      dataframe_filtered = dataframe.loc[:, filtered_columns]

      # function that extracts the category of the venue
      def get_category_type(row):
          try:
              categories_list = row['categories']
          except:
              categories_list = row['venue.categories']

          if len(categories_list) == 0:
              return None
          else:
              return categories_list[0]['name']

      # filter the category for each row
      dataframe_filtered['categories'] = dataframe_filtered.apply(get_category_type,
      ↪axis=1)

      # clean column names by keeping only last term
      dataframe_filtered.columns = [column.split('.')[ -1] for column in
      ↪dataframe_filtered.columns]

      dataframe_filtered
```

```
[8]:
```

		name	categories \
0		Food from Farmers	Burger Joint
1		Jelmoli Food Market	Market
2		Hong-Kong Food Paradise	Chinese Restaurant
3		Food Station	Food Court
4	Coop Supermarkt City Zürich St. Annahof	Food	None
5	Coop Supermarkt City Zürich Bellevue	Food	None
6		Viet Street Food	Vietnamese Restaurant
7	Vee's Bistro - Thai Food - Take away		Thai Restaurant
8		food&lab	Cafeteria
9		Thai Food Corner GmbH	None
10		Wood Food	Restaurant
11		Foodpoint	Snack Place

  

	address	crossStreet	lat	lng \
0	Langstrasse 211	Josefstrasse	47.368502	8.545671
1	NaN	NaN	47.374083	8.537229

2	Seidengasse 1	NaN	47.374042	8.536562
3	Bahnhofplatz 15	NaN	47.378204	8.535982
4	Bahnhofstrasse 57	NaN	47.372902	8.538024
5	Theaterstrasse 18	NaN	47.367308	8.546079
6	Usteristrasse 21	NaN	47.376122	8.536371
7	Alfred Escher-Strasse 11	NaN	47.364968	8.532719
8	Rämistr. 101	NaN	47.378327	8.548848
9	NaN	NaN	47.379329	8.535520
10	Werdstrasse 128	NaN	47.369881	8.523865
11	Köngengasse	NaN	47.373677	8.543674

	labeledLatLngs	distance	postalCode \
0	[{'label': 'display', 'lat': 47.36850193220842...	360	8005
1	[{'label': 'display', 'lat': 47.3740827107709,...	539	NaN
2	[{'label': 'display', 'lat': 47.37404169003569...	568	8001
3	[{'label': 'display', 'lat': 47.378204, 'lng':...	980	NaN
4	[{'label': 'display', 'lat': 47.37290177, 'lng'...	400	8001
5	[{'label': 'display', 'lat': 47.367308, 'lng':...	468	8024
6	[{'label': 'display', 'lat': 47.376122, 'lng':...	763	NaN
7	[{'label': 'display', 'lat': 47.36496831906324...	896	8002
8	[{'label': 'display', 'lat': 47.37832683213607...	1046	NaN
9	[{'label': 'display', 'lat': 47.37932922752695...	1109	NaN
10	[{'label': 'display', 'lat': 47.36988067626953...	1342	NaN
11	[{'label': 'display', 'lat': 47.373677, 'lng':...	407	NaN

	cc	city	state	country \
0	CH	Zürich	Zürich	Schweiz
1	CH	NaN	NaN	Schweiz
2	CH	Zürich	Zürich	Schweiz
3	CH	NaN	NaN	Schweiz
4	CH	Zürich	Zürich	Schweiz
5	CH	Zürich	Zürich	Schweiz
6	CH	Zürich	Zürich	Schweiz
7	CH	Zürich	Zürich	Schweiz
8	CH	Zürich	Zürich	Schweiz
9	CH	NaN	NaN	Schweiz
10	CH	Zürich	Zürich	Schweiz
11	CH	Zürich	Zürich	Schweiz

	formattedAddress	neighborhood \
0	[Langstrasse 211 (Josefstrasse), 8005 Zürich, ...	NaN
1	[Schweiz]	NaN
2	[Seidengasse 1, 8001 Zürich, Schweiz]	NaN
3	[Bahnhofplatz 15, Schweiz]	NaN
4	[Bahnhofstrasse 57, 8001 Zürich, Schweiz]	NaN
5	[Theaterstrasse 18, 8024 Zürich, Schweiz]	NaN
6	[Usteristrasse 21, Zürich, Schweiz]	NaN

7	[Alfred Escher-Strasse 11, 8002 Zürich, Schweiz]	NaN
8	[Rämistr. 101, Zürich, Schweiz]	Oberstrass
9	[Schweiz]	NaN
10	[Werdstrasse 128, Zürich, Schweiz]	NaN
11	[Köngengasse, Zürich, Schweiz]	NaN

	id
0	560595f7498eb0f06171956e
1	5357cc16498e0e40db63f54a
2	4e87185182316be403a7f640
3	5bac7c428b98fd0039448a15
4	5cc1c6a4cabcff002ce22ad4
5	5cc1c8e44a1cc0002c7d8132
6	5e0b4830456d3b000815955b
7	5595fd46498e7e817b7f5605
8	4b5841fff964a520e24f28e3
9	4f8d5903e4b0e5ed77fe6a91
10	541b0dc0498e72849f8be245
11	4ca63d1944a8224bfe5f0140

[ ]:

```
[9]: venues_map = folium.Map(location=[latitude, longitude], zoom_start=13) #
    ↳ generate map centred around the Conrad Hotel

# add a red circle marker to represent the Conrad Hotel
folium.features.CircleMarker(
    [latitude, longitude],
    radius=10,
    color='red',
    popup='Conrad Hotel',
    fill = True,
    fill_color = 'red',
    fill_opacity = 0.6
).add_to(venues_map)

# add the Italian restaurants as blue circle markers
for lat, lng, label in zip(dataframe_filtered.lat, dataframe_filtered.lng,
    ↳ dataframe_filtered.categories):
    folium.features.CircleMarker(
        [lat, lng],
        radius=5,
        color='blue',
        popup=label,
        fill = True,
        fill_color='blue',
        fill_opacity=0.6
```

```

    ).add_to(venues_map)

# display map
venues_map

```

[9]: <folium.folium.Map at 0x7fd9a587af60>

```

[56]: # KREIS2
search_query = 'restaurant'
radius = 1500
print(search_query + ' .... OK!')
latitude = 47.3375
longitude = 8.520833
url = 'https://api.foursquare.com/v2/venues/search?
      ↪client_id={}&client_secret={}&ll={},{}&v={}&query={}&radius={}&limit={}'.
      ↪format(CLIENT_ID, CLIENT_SECRET, latitude, longitude, VERSION, search_query,
      ↪radius, LIMIT)
url

```

restaurant ... OK!

[56]: 'https://api.foursquare.com/v2/venues/search?client\_id=RLM401CAFIWXLU00LBV2Z33DT45BIULLHUNEYKM4LMR02VUK&client\_secret=D5G4H1H3PSWZWTET3IA05P55H4CJ2X4XWTIKLTBU11QBHQ&ll=47.3375,8.520833&v=20180605&query=restaurant&radius=1500&limit=100'

```

[57]: results1 = requests.get(url).json()

```

```

[58]: # assign relevant part of JSON to venues
venues1 = results1['response']['venues']

# transform venues into a dataframe
dataframe1 = pd.json_normalize(venues1)
dataframe1

```

```

[58]:
      id                                     name \
0  54d10fd7498e22dcd5554932      Restaurant Mellow
1  4da575440437667c9b2b984e      Restaurant Medina
2  4bbf01dd98f495212df6d163  SV Restaurant Manegg
3  4b05888af964a520afcc22e3      Restaurant Bürgli
4  4b83b36cf964a520730d31e3      Restaurant Casa-Nostrana
5  4e6f2dc9b0fbacf2ada29857      Restaurant Renggergut
6  4b5ebc95f964a520319729e3      Restaurant zur rote Buech
7  5af09361bed483002c28c903  Restaurant Tennisclub Seeblick
8  577d382a498e7549bd9cc42f      WINIT's Restaurant
9  5a48d7272be4257246b49ee8  Yan-Ruyi Chinesisches Restaurant
10 5329d87a498e79f67441e074      Migros Restaurant
11 4b20d6cbf964a520d63424e3      Boom Restaurant

```

12 4bc2f43dabf495211514c393

Seerose

	categories	referralId	hasPerk \
0	[]	v-1591132790	False
1	[{'id': '4bf58dd8d48988d1c4941735', 'name': 'R...	v-1591132790	False
2	[{'id': '4bf58dd8d48988d1c4941735', 'name': 'R...	v-1591132790	False
3	[{'id': '4bf58dd8d48988d1c4941735', 'name': 'R...	v-1591132790	False
4	[{'id': '4bf58dd8d48988d110941735', 'name': 'I...	v-1591132790	False
5	[{'id': '4bf58dd8d48988d1c4941735', 'name': 'R...	v-1591132790	False
6	[{'id': '4bf58dd8d48988d1c4941735', 'name': 'R...	v-1591132790	False
7	[{'id': '4bf58dd8d48988d1c4941735', 'name': 'R...	v-1591132790	False
8	[{'id': '4bf58dd8d48988d149941735', 'name': 'T...	v-1591132790	False
9	[{'id': '4bf58dd8d48988d145941735', 'name': 'C...	v-1591132790	False
10	[{'id': '4bf58dd8d48988d1c4941735', 'name': 'R...	v-1591132790	False
11	[{'id': '4bf58dd8d48988d16c941735', 'name': 'B...	v-1591132790	False
12	[{'id': '4bf58dd8d48988d1c4941735', 'name': 'R...	v-1591132790	False

	location.address	location.lat	location.lng \
0	Albisstrasse 84	47.340591	8.530216
1	Albisstrasse 72	47.342189	8.530554
2	NaN	47.338563	8.518558
3	Kilchbergstr. 15	47.343048	8.533720
4	Albisstrasse 25	47.344131	8.531738
5	NaN	47.344093	8.532964
6	Seestrasse 361	47.345600	8.533525
7	NaN	47.333117	8.538267
8	Albisstrasse 29	47.344076	8.531424
9	NaN	47.344070	8.532312
10	Etzelstrasse 3	47.344288	8.529977
11	Zürichstrasse 105	47.326571	8.529088
12	Seestrasse 493	47.338370	8.540682

	location.labeledLatLngs	location.distance \
0	[{'label': 'display', 'lat': 47.340591, 'lng':...	787
1	[{'label': 'display', 'lat': 47.34218895149141...	900
2	[{'label': 'display', 'lat': 47.33856296516321...	208
3	[{'label': 'display', 'lat': 47.34304818849731...	1151
4	[{'label': 'display', 'lat': 47.34413104786304...	1105
5	[{'label': 'display', 'lat': 47.34409332275390...	1173
6	[{'label': 'display', 'lat': 47.34560000993326...	1315
7	[{'label': 'display', 'lat': 47.333117, 'lng':...	1402
8	[{'label': 'display', 'lat': 47.344076, 'lng':...	1083
9	[{'label': 'display', 'lat': 47.34407, 'lng': ...	1133
10	[{'label': 'display', 'lat': 47.34428776104288...	1023
11	[{'label': 'display', 'lat': 47.32657086353194...	1366
12	[{'label': 'display', 'lat': 47.33836998032554...	1500



	location.postalCode	location.cc	location.city	location.state	\
0	8038	CH	Zürich	Zürich	
1	8038	CH	Zürich	Zürich	
2	NaN	CH	NaN	NaN	
3	8038	CH	Zürich	Zürich	
4	NaN	CH	Zürich	Zürich	
5	NaN	CH	NaN	NaN	
6	NaN	CH	Zürich	Zürich	
7	NaN	CH	NaN	NaN	
8	8038	CH	Zürich	Zürich	
9	NaN	CH	NaN	NaN	
10	NaN	CH	Zürich	Zürich	
11	8134	CH	Zürich-Adliswil	Switzerland	
12	8038	CH	Zürich	Zürich	

	location.country	location.formattedAddress	\
0	Schweiz	[Albisstrasse 84, 8038 Zürich, Schweiz]	
1	Schweiz	[Albisstrasse 72, 8038 Zürich, Schweiz]	
2	Schweiz	[Schweiz]	
3	Schweiz	[Kilchbergstr. 15, 8038 Zürich, Schweiz]	
4	Schweiz	[Albisstrasse 25, Zürich, Schweiz]	
5	Schweiz	[Schweiz]	
6	Schweiz	[Seestrasse 361, Zürich, Schweiz]	
7	Schweiz	[Schweiz]	
8	Schweiz	[Albisstrasse 29, 8038 Zürich, Schweiz]	
9	Schweiz	[Schweiz]	
10	Schweiz	[Etzelstrasse 3, Zürich, Schweiz]	
11	Schweiz	[Zürichstrasse 105, 8134 Zürich-Adliswil, Schw...]	
12	Schweiz	[Seestrasse 493, 8038 Zürich, Schweiz]	

	venuePage.id
0	147070151
1	NaN
2	NaN
3	NaN
4	NaN
5	NaN
6	NaN
7	NaN
8	NaN
9	NaN
10	NaN
11	NaN
12	NaN

```
[59]: # keep only columns that include venue name, and anything that is associated
      ↪with location
```

```

filtered_columns = ['name', 'categories'] + [col for col in dataframe1.columns_
↳if col.startswith('location.')] + ['id']
dataframe1_filtered = dataframe1.loc[:, filtered_columns]

# function that extracts the category of the venue
def get_category_type(row):
    try:
        categories_list = row['categories']
    except:
        categories_list = row['venue.categories']

    if len(categories_list) == 0:
        return None
    else:
        return categories_list[0]['name']

# filter the category for each row
dataframe1_filtered['categories'] = dataframe1_filtered.
↳apply(get_category_type, axis=1)

# clean column names by keeping only last term
dataframe1_filtered.columns = [column.split('.')[ -1] for column in_
↳dataframe1_filtered.columns]

dataframe1_filtered

```

[59]:

	name	categories	address \
0	Restaurant Mellow	None	Albisstrasse 84
1	Restaurant Medina	Restaurant	Albisstrasse 72
2	SV Restaurant Manegg	Restaurant	NaN
3	Restaurant Bürgli	Restaurant	Kilchbergstr. 15
4	Restaurant Casa-Nostrana	Italian Restaurant	Albisstrasse 25
5	Restaurant Renggergut	Restaurant	NaN
6	Restaurant zur rote Buech	Restaurant	Seestrasse 361
7	Restaurant Tennisclub Seeblick	Restaurant	NaN
8	WINIT's Restaurant	Thai Restaurant	Albisstrasse 29
9	Yan-Ruyi Chinesisches Restaurant	Chinese Restaurant	NaN
10	Migros Restaurant	Restaurant	Etzelstrasse 3
11	Boom Restaurant	Burger Joint	Zürichstrasse 105
12	Seerose	Restaurant	Seestrasse 493

	lat	lng	labeledLatLngs \
0	47.340591	8.530216	[{'label': 'display', 'lat': 47.340591, 'lng':...
1	47.342189	8.530554	[{'label': 'display', 'lat': 47.34218895149141...
2	47.338563	8.518558	[{'label': 'display', 'lat': 47.33856296516321...
3	47.343048	8.533720	[{'label': 'display', 'lat': 47.34304818849731...
4	47.344131	8.531738	[{'label': 'display', 'lat': 47.34413104786304...

5	47.344093	8.532964	[{'label': 'display', 'lat': 47.34409332275390...
6	47.345600	8.533525	[{'label': 'display', 'lat': 47.34560000993326...
7	47.333117	8.538267	[{'label': 'display', 'lat': 47.333117, 'lng':...
8	47.344076	8.531424	[{'label': 'display', 'lat': 47.344076, 'lng':...
9	47.344070	8.532312	[{'label': 'display', 'lat': 47.34407, 'lng': ...
10	47.344288	8.529977	[{'label': 'display', 'lat': 47.34428776104288...
11	47.326571	8.529088	[{'label': 'display', 'lat': 47.32657086353194...
12	47.338370	8.540682	[{'label': 'display', 'lat': 47.33836998032554...

	distance	postalCode	cc	city	state	country	\
0	787	8038	CH	Zürich	Zürich	Schweiz	
1	900	8038	CH	Zürich	Zürich	Schweiz	
2	208	NaN	CH	NaN	NaN	Schweiz	
3	1151	8038	CH	Zürich	Zürich	Schweiz	
4	1105	NaN	CH	Zürich	Zürich	Schweiz	
5	1173	NaN	CH	NaN	NaN	Schweiz	
6	1315	NaN	CH	Zürich	Zürich	Schweiz	
7	1402	NaN	CH	NaN	NaN	Schweiz	
8	1083	8038	CH	Zürich	Zürich	Schweiz	
9	1133	NaN	CH	NaN	NaN	Schweiz	
10	1023	NaN	CH	Zürich	Zürich	Schweiz	
11	1366	8134	CH	Zürich-Adliswil	Switzerland	Schweiz	
12	1500	8038	CH	Zürich	Zürich	Schweiz	

	formattedAddress	\
0	[Albisstrasse 84, 8038 Zürich, Schweiz]	
1	[Albisstrasse 72, 8038 Zürich, Schweiz]	
2	[Schweiz]	
3	[Kilchbergstr. 15, 8038 Zürich, Schweiz]	
4	[Albisstrasse 25, Zürich, Schweiz]	
5	[Schweiz]	
6	[Seestrasse 361, Zürich, Schweiz]	
7	[Schweiz]	
8	[Albisstrasse 29, 8038 Zürich, Schweiz]	
9	[Schweiz]	
10	[Etzelstrasse 3, Zürich, Schweiz]	
11	[Zürichstrasse 105, 8134 Zürich-Adliswil, Schw...	
12	[Seestrasse 493, 8038 Zürich, Schweiz]	

	id
0	54d10fd7498e22dcd5554932
1	4da575440437667c9b2b984e
2	4bbf01dd98f495212df6d163
3	4b05888af964a520afcc22e3
4	4b83b36cf964a520730d31e3
5	4e6f2dc9b0fbacf2ada29857
6	4b5ebc95f964a520319729e3

```

7  5af09361bed483002c28c903
8  577d382a498e7549bd9cc42f
9  5a48d7272be4257246b49ee8
10 5329d87a498e79f67441e074
11 4b20d6cbf964a520d63424e3
12 4bc2f43dabf495211514c393

```

```

[60]: venues_map1 = folium.Map(location=[latitude, longitude], zoom_start=13) #
      ↪generate map centred around the Conrad Hotel

# add a red circle marker to represent the Conrad Hotel
folium.features.CircleMarker(
    [latitude, longitude],
    radius=10,
    color='red',
    popup='Kreis2',
    fill = True,
    fill_color = 'red',
    fill_opacity = 0.6
).add_to(venues_map1)

# add the Italian restaurants as blue circle markers
for lat, lng, label in zip(dataframe1_filtered.lat, dataframe1_filtered.lng,
      ↪dataframe1_filtered.categories):
    folium.features.CircleMarker(
        [lat, lng],
        radius=5,
        color='blue',
        popup=label,
        fill = True,
        fill_color='blue',
        fill_opacity=0.6
    ).add_to(venues_map1)

# display map
venues_map1

```

```

[60]: <folium.folium.Map at 0x7fd9a568e550>

```

```

[71]: # KREIS3
      search_query = 'restaurant'
      radius = 1500
      print(search_query + ' .... OK!')
      latitude = 47.361944
      longitude = 8.514722

```

```
url = 'https://api.foursquare.com/v2/venues/search?
↳client_id={}&client_secret={}&ll={},{}&v={}&query={}&radius={}&limit={}'.
↳format(CLIENT_ID, CLIENT_SECRET, latitude, longitude, VERSION, search_query,
↳radius, LIMIT)
url
```

restaurant ... OK!

```
[71]: 'https://api.foursquare.com/v2/venues/search?client_id=RLM401CAFIWXLU00LBV2Z33DT
45BIULLHUNEYKM4LMR02VUK&client_secret=D5G4H1H3PSWZWTET3IA05P55H4CJ2X4XWTIKLTBU1
1QBHQB&ll=47.361944,8.514722&v=20180605&query=restaurant&radius=1500&limit=100'
```

```
[72]: results2 = requests.get(url).json()
```

```
[73]: # assign relevant part of JSON to venues
venues2 = results2['response']['venues']

# transform venues into a dataframe
dataframe2 = pd.json_normalize(venues2)
dataframe2
```

```
[73]:
```

	id	name \
0	5165a91ee4b0c547d16fca83	Restaurant Hopfenau
1	4cf3678e7bf3b60cb9d36a7f	Restaurant Eat&Meet
2	4dcce3bacc3f07eb1efee990	Restaurant Orangerie
3	4b439110f964a5205ce325e3	Restaurant Bederhof
4	4dd64b51d22d38ef42cb0d04	Migros Restaurant
5	4cf5f10c1801a14319b7e6d4	Rampe Süd Restaurant
6	4c878219e602b1f7f02ec87a	Coop Restaurant Zürich Wiedikon
7	4d958142c19fb60c7a0a6865	Migros Restaurant
8	5b7042d6dff8150039cc3938	Restaurant Bar Cafe Eyhof
9	5236dcb011d2fa11b2b7a442	Restaurant Nachtjäger
10	4d94d8bcca3f6ea80f3cd334	Hardhof Café & Restaurant
11	4bf65bc494b2a593ae4aadee	Restaurant Vietnam
12	4c7cb5a27a856dcb34f5e2a7	China Restaurant Peking
13	4b556518f964a52042e327e3	Restaurant Vereinigung
14	4c30d70366e40f47a31fc48b	Restaurant Falcone
15	501c4a47e4b0ccb680baecc9	Restaurant Kafi Minh
16	5aedb0625455b2002cd26a9c	Restaurant La Piazza
17	4cb03a691168a093c9da2823	Coop Restaurant
18	4ec640b0722eeaa24c8baac3	Kebab Restaurant Uniteti
19	4d543075bdbea1cda337e492	Restaurant Gran Sasso
20	4b617287f964a520e8132ae3	Restaurant Idaburg
21	4e442d0d1495455b10ca400e	Restaurant Schützenruh
22	507fdb50498ef796571afc60	Migros Restaurant
23	518a9def498eac03d58fd1de	Restaurant Rietberg
24	4c9363fa66dfef3bedff9c03	Restaurant Bahnhof Wiedikon

25	4ffa0347e4b083d14d6d414e	Restaurant Manesse
26	4c0e6a5185e195219379eea5	Restaurant Belvoirpark Zürich
27	4e4b9a3052b1119aaa6f2607	Restaurant Schmiedhof
28	4efa108893ad7cf2ecb7353a	Restaurant-Bar Perry
29	4bd9b1b32e6f0f47f7840b08	Restaurant Gertrudhof
30	4b276e0df964a520618624e3	Restaurant Werdguet
31	514c9ca3e4b07a3d6fe58dda	Restaurant Hermanns Eck
32	509d43bae4b0383a0d519852	Restaurant Oberes Triemli
33	4ca6384fb7106dcb2de05ba5	Restaurant Ecke
34	4ffea34ee4b042ae8a92e6da	Thai Restaurant Take Away
35	58727fed02b60e3b69b49ed3	Restaurant AXOi
36	4b058888f964a5200acc22e3	Restaurant Emilio
37	4b0a5e0ef964a520922323e3	Restaurant Werd
38	4e1d76cdaeb78c0dfecff4d	Restaurant Mimosa
39	52dd3692498e473cad5d4448	Restaurant Rosenberg
40	4c8297952f1c236a290d3b43	Vietnam Restaurant-La
41	4b9f78a3f964a520d02437e3	Restaurant Biergarten
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43	5015b2c8e4b097af8b218664	Restaurant Caravelle
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9	Badenerstr. 310	47.377378	8.512408
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11	Uetlibergstrasse 77	47.362323	8.518556
12	Verena-Conzett-Strasse 21	47.370704	8.526782
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46	Molkenstrasse	20	47.376872	8.526771
47	Kanzleistrasse	121	47.376710	8.520770
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49	Kochstr.	2	47.377926	8.516215

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location.country

location.formattedAddress \

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3	Schweiz	[Brandschenkestr. 177 (Bederstr.), 8002 Zürich...
4	Schweiz	[Giesshübelstr. 65, 8045 Zürich, Schweiz]
5	Schweiz	[Four Points Hotel (Kalandergerasse 1), 8045 Zür...
6	Schweiz	[Birmensdorferstrasse 200, 8003 Zürich, Schweiz]
7	Schweiz	[Birmensdorferstr. 320, 8055 Zürich, Schweiz]
8	Schweiz	[8047 Zürich, Schweiz]
9	Schweiz	[Badenerstr. 310, Zürich, Schweiz]
10	Schweiz	[Badenerstrasse 344, 8004 Zürich, Schweiz]
11	Schweiz	[Uetlibergstrasse 77, 8045 Zürich, Schweiz]
12	Schweiz	[Verena-Conzett-Strasse 21, 8004 Zürich, Schweiz]
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40	Schweiz	[Wasserschöpfli 2 (Friesenbergstrasse), 8055 Z...
41	Schweiz	[Hohlstrasse 25 (Langstrasse), 8004 Zürich, Sc...
42	Schweiz	[Langstr. 64, 8004 Zürich, Schweiz]
43	Schweiz	[Schweiz]
44	Schweiz	[Badenerstrasse 357, 8003 Zürich, Schweiz]
45	Schweiz	[8004 Zürich, Schweiz]
46	Schweiz	[Molkenstrasse 20, 8004 Zürich, Schweiz]

47	Schweiz	[Kanzleistrasse 121 (Pflanzschulstr.), 8004 Zü...
48	Schweiz	[Hohlstrasse 32, 8004 Zürich, Schweiz]
49	Schweiz	[Kochstr. 2, 8004 Zürich, Schweiz]

	location.crossStreet	venuePage.id	location.neighborhood
0	NaN	NaN	NaN
1	NaN	NaN	NaN
2	Hotel Engimatt	NaN	NaN
3	Bederstr.	NaN	NaN
4	NaN	NaN	NaN
5	Kalandergerasse 1	NaN	NaN
6	NaN	537196507	NaN
7	NaN	NaN	NaN
8	NaN	NaN	Albisrieden
9	NaN	NaN	Sihlfeld
10	NaN	NaN	NaN
11	NaN	NaN	NaN
12	NaN	NaN	NaN
13	NaN	NaN	NaN
14	Schmiede Wiedikon	151386724	NaN
15	NaN	NaN	NaN
16	NaN	NaN	NaN
17	NaN	NaN	NaN
18	NaN	NaN	NaN
19	NaN	79795834	NaN
20	NaN	NaN	NaN
21	NaN	NaN	NaN
22	NaN	NaN	NaN
23	NaN	NaN	NaN
24	Birmensdorferstrasse	NaN	NaN
25	NaN	NaN	NaN
26	NaN	NaN	NaN
27	NaN	565446030	NaN
28	NaN	NaN	NaN
29	NaN	NaN	NaN
30	NaN	NaN	NaN
31	NaN	NaN	NaN
32	NaN	505987258	NaN
33	NaN	NaN	NaN
34	NaN	NaN	NaN
35	NaN	NaN	NaN
36	Eingang an der Birmensdorferstrasse	109899337	NaN
37	Birmensdorferstr.	NaN	NaN
38	NaN	NaN	NaN
39	Zypressenstrasse	NaN	NaN
40	Friesenbergstrasse	NaN	NaN
41	Langstrasse	564308868	NaN

42		NaN	NaN	NaN
43		NaN	NaN	NaN
44		NaN	NaN	NaN
45		NaN	NaN	NaN
46		NaN	NaN	NaN
47	Pflanzschulstr.		NaN	NaN
48		NaN	541167643	NaN
49		NaN	NaN	NaN

```
[74]: # keep only columns that include venue name, and anything that is associated
      ↪with location
filtered_columns = ['name', 'categories'] + [col for col in dataframe2.columns
      ↪if col.startswith('location.')] + ['id']
dataframe2_filtered = dataframe2.loc[:, filtered_columns]

# function that extracts the category of the venue
def get_category_type(row):
    try:
        categories_list = row['categories']
    except:
        categories_list = row['venue.categories']

    if len(categories_list) == 0:
        return None
    else:
        return categories_list[0]['name']

# filter the category for each row
dataframe2_filtered['categories'] = dataframe2_filtered.
      ↪apply(get_category_type, axis=1)

# clean column names by keeping only last term
dataframe2_filtered.columns = [column.split('.')[0] for column in
      ↪dataframe2_filtered.columns]

dataframe2_filtered
```

```
[74]:
```

	name	categories \
0	Restaurant Hopfenau	Restaurant
1	Restaurant Eat&Meet	Cafeteria
2	Restaurant Orangerie	French Restaurant
3	Restaurant Bederhof	Swiss Restaurant
4	Migros Restaurant	Restaurant
5	Rampe Süd Restaurant	Breakfast Spot
6	Coop Restaurant Zürich Wiedikon	Supermarket
7	Migros Restaurant	Restaurant
8	Restaurant Bar Cafe Eyhof	Restaurant

9	Restaurant Nachtjäger	Swiss Restaurant
10	Hardhof Café & Restaurant	Swiss Restaurant
11	Restaurant Vietnam	Asian Restaurant
12	China Restaurant Peking	Chinese Restaurant
13	Restaurant Vereinigung	Tapas Restaurant
14	Restaurant Falcone	Italian Restaurant
15	Restaurant Kafi Minh	None
16	Restaurant La Piazza	Swiss Restaurant
17	Coop Restaurant	Breakfast Spot
18	Kebab Restaurant Uniteti	Diner
19	Restaurant Gran Sasso	Steakhouse
20	Restaurant Idaburg	Restaurant
21	Restaurant Schützenruh	Swiss Restaurant
22	Migros Restaurant	Restaurant
23	Restaurant Rietberg	Swiss Restaurant
24	Restaurant Bahnhof Wiedikon	Restaurant
25	Restaurant Manesse	None
26	Restaurant Belvoirpark Zürich	Restaurant
27	Restaurant Schmiedhof	Restaurant
28	Restaurant-Bar Perry	Swiss Restaurant
29	Restaurant Gertrudhof	Swiss Restaurant
30	Restaurant Werdguet	Swiss Restaurant
31	Restaurant Hermanns Eck	Restaurant
32	Restaurant Oberes Triemli	Swiss Restaurant
33	Restaurant Ecke	Swiss Restaurant
34	Thai Restaurant Take Away	Thai Restaurant
35	Restaurant AXOi	Restaurant
36	Restaurant Emilio	Spanish Restaurant
37	Restaurant Werd	Swiss Restaurant
38	Restaurant Mimosa	Italian Restaurant
39	Restaurant Rosenberg	Swiss Restaurant
40	Vietnam Restaurant-La	Asian Restaurant
41	Restaurant Biergarten	Beer Garden
42	Restaurant Krokodil	Restaurant
43	Restaurant Caravelle	None
44	Restaurant Stoller	Bistro
45	Restaurant Bank	Restaurant
46	Restaurant Tremundi	Restaurant
47	Restaurant La Pergola	Italian Restaurant
48	Restaurant Sonne	Thai Restaurant
49	Restaurant Cafe Boy	Diner

	address	lat	lng	\
0	Hopfenstrasse 19	47.365205	8.519986	
1	Binzring 17	47.361802	8.510070	
2	Engimattstr. 14	47.359480	8.524874	
3	Brandschenkestr. 177	47.362397	8.526789	

4	Giesshübelstr. 65	47.358242	8.517387
5	Four Points Hotel	47.359240	8.522965
6	Birmensdorferstrasse 200	47.370746	8.515905
7	Birmensdorferstr. 320	47.369931	8.508418
8	NaN	47.368526	8.495234
9	Badenerstr. 310	47.377378	8.512408
10	Badenerstrasse 344	47.378126	8.510778
11	Uetlibergstrasse 77	47.362323	8.518556
12	Verena-Conzett-Strasse 21	47.370704	8.526782
13	Manessestrasse 132	47.363006	8.522282
14	Birmensdorferstrasse 150	47.370125	8.519541
15	NaN	47.365115	8.508642
16	NaN	47.360900	8.506855
17	Badenerstrasse 15	47.373675	8.530176
18	Uetlibergstrasse 109	47.361071	8.517254
19	Aegertenstr. 2	47.368128	8.524152
20	Gertrudstrasse 44	47.373403	8.515037
21	NaN	47.353689	8.511931
22	NaN	47.363172	8.517456
23	Waffenplatzstrasse 63	47.354511	8.528989
24	Seebahnstrasse 33	47.371102	8.523308
25	NaN	47.368880	8.524653
26	Seestrasse 125	47.357614	8.533223
27	Zweierstrasse 136	47.370916	8.519556
28	Zentralstrasse 36	47.371853	8.519703
29	Gertrudstrasse 26, 8003 Zürich	47.373791	8.515934
30	Morgartenstr. 30	47.371441	8.527644
31	NaN	47.371522	8.523169
32	Birmensdorferstrasse 535	47.366876	8.493248
33	NaN	47.374410	8.517692
34	NaN	47.363563	8.520374
35	Badenerstrasse 217	47.375197	8.517840
36	Zweierstr. 9	47.372937	8.527220
37	Werdstr. 75	47.372254	8.527612
38	NaN	47.363488	8.533927
39	Badenerstrasse 287	47.377117	8.512784
40	Wasserschöpfli 2	47.365334	8.508995
41	Hohlstrasse 25	47.376954	8.527221
42	Langstr. 64	47.377392	8.526367
43	NaN	47.377493	8.522628
44	Badenerstrasse 357	47.378578	8.509428
45	NaN	47.376313	8.526625
46	Molkenstrasse 20	47.376872	8.526771
47	Kanzleistrasse 121	47.376710	8.520770
48	Hohlstrasse 32	47.377278	8.526960
49	Kochstr. 2	47.377926	8.516215

	labeledLatLngs	distance	postalCode	\
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1	[{'label': 'display', 'lat': 47.36180195165452...	351	8045	
2	[{'label': 'display', 'lat': 47.35948010766192...	813	8002	
3	[{'label': 'display', 'lat': 47.36239667110947...	911	8002	
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5	[{'label': 'display', 'lat': 47.35923995533381...	690	8045	
6	[{'label': 'display', 'lat': 47.37074636, 'lng'...	983	8003	
7	[{'label': 'display', 'lat': 47.36993134937684...	1008	8055	
8	[{'label': 'display', 'lat': 47.368526, 'lng':...	1641	8047	
9	[{'label': 'display', 'lat': 47.37737792805111...	1726	NaN	
10	[{'label': 'display', 'lat': 47.37812551106540...	1825	8004	
11	[{'label': 'display', 'lat': 47.36232343699173...	292	8045	
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13	[{'label': 'display', 'lat': 47.36300582977962...	582	8045	
14	[{'label': 'display', 'lat': 47.37012477458556...	980	8003	
15	[{'label': 'display', 'lat': 47.365115, 'lng':...	578	NaN	
16	[{'label': 'display', 'lat': 47.3609, 'lng': 8...	604	8045	
17	[{'label': 'display', 'lat': 47.373675, 'lng':...	1750	8004	
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19	[{'label': 'display', 'lat': 47.36812803432419...	989	8003	
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21	[{'label': 'display', 'lat': 47.35368860828790...	942	NaN	
22	[{'label': 'display', 'lat': 47.36317159562804...	247	NaN	
23	[{'label': 'display', 'lat': 47.35451076518308...	1357	8002	
24	[{'label': 'display', 'lat': 47.37110156568581...	1207	8003	
25	[{'label': 'display', 'lat': 47.36888041880561...	1075	NaN	
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27	[{'label': 'display', 'lat': 47.37091600376443...	1063	8003	
28	[{'label': 'display', 'lat': 47.371853, 'lng':...	1165	8003	
29	[{'label': 'display', 'lat': 47.37379063895187...	1321	NaN	
30	[{'label': 'display', 'lat': 47.37144052979683...	1437	8004	
31	[{'label': 'display', 'lat': 47.37152211214322...	1241	NaN	
32	[{'label': 'display', 'lat': 47.366876, 'lng':...	1709	8055	
33	[{'label': 'display', 'lat': 47.37441, 'lng': ...	1405	NaN	
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41	[{'label': 'display', 'lat': 47.37695434, 'lng'...	1918	8004	
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43	[{'label': 'display', 'lat': 47.377493, 'lng':...	1830	NaN	
44	[{'label': 'display', 'lat': 47.378578, 'lng':...	1894	8003	
45	[{'label': 'display', 'lat': 47.376313, 'lng':...	1834	8004	



46	[{'label': 'display', 'lat': 47.376872, 'lng':...	1893	8004
47	[{'label': 'display', 'lat': 47.37671, 'lng': ...	1705	8004
48	[{'label': 'display', 'lat': 47.377278, 'lng':...	1940	8004
49	[{'label': 'display', 'lat': 47.37792578601071...	1782	8004

	cc	city	state	country \
0	CH	Zürich	Zürich	Schweiz
1	CH	Zürich	Zürich	Schweiz
2	CH	Zürich	Zürich	Schweiz
3	CH	Zürich	Zürich	Schweiz
4	CH	Zürich	Zürich	Schweiz
5	CH	Zürich	Zürich	Schweiz
6	CH	Zürich	Zürich	Schweiz
7	CH	Zürich	Zürich	Schweiz
8	CH	Zürich	Zürich	Schweiz
9	CH	Zürich	Zürich	Schweiz
10	CH	Zürich	Zürich	Schweiz
11	CH	Zürich	Zürich	Schweiz
12	CH	Zürich	Zürich	Schweiz
13	CH	Zürich	Zürich	Schweiz
14	CH	Zürich	Zürich	Schweiz
15	CH	NaN	NaN	Schweiz
16	CH	Zürich	Zürich	Schweiz
17	CH	Zürich	Zürich	Schweiz
18	CH	Zürich	Zürich	Schweiz
19	CH	Zürich	Zürich	Schweiz
20	CH	Zürich	Zürich	Schweiz
21	CH	NaN	NaN	Schweiz
22	CH	Zürich	Zürich	Schweiz
23	CH	Zürich	Zürich	Schweiz
24	CH	Zürich	Zürich	Schweiz
25	CH	NaN	NaN	Schweiz
26	CH	Zürich	Zürich	Schweiz
27	CH	Zürich	Zürich	Schweiz
28	CH	Zürich	Zürich	Schweiz
29	CH	Zürich	Zürich	Schweiz
30	CH	Zürich	Zürich	Schweiz
31	CH	NaN	NaN	Schweiz
32	CH	Zürich	Zürich	Schweiz
33	CH	NaN	NaN	Schweiz
34	CH	Zürich	Zürich	Schweiz
35	CH	Zürich	Zürich	Schweiz
36	CH	Zürich	Zürich	Schweiz
37	CH	Zürich	Zürich	Schweiz
38	CH	Zürich	Zürich	Schweiz
39	CH	Zürich	Zürich	Schweiz
40	CH	Zürich	Zürich	Schweiz

```

41 CH Zürich Zürich Schweiz
42 CH Zürich Zürich Schweiz
43 CH NaN NaN Schweiz
44 CH Zürich Zürich Schweiz
45 CH Zürich Zürich Schweiz
46 CH Zürich Zürich Schweiz
47 CH Zürich Zürich Schweiz
48 CH Zürich Zürich Schweiz
49 CH Zürich Zürich Schweiz

```

```

                                formattedAddress \
0          [Hopfenstrasse 19, 8045 Zürich, Schweiz]
1          [Binzring 17, 8045 Zürich, Schweiz]
2  [Engimattstr. 14 (Hotel Engimatt), 8002 Zürich...]
3  [Brandschenkestr. 177 (Bederstr.), 8002 Zürich...]
4          [Giesshübelstr. 65, 8045 Zürich, Schweiz]
5  [Four Points Hotel (Kalandergasse 1), 8045 Zür...]
6  [Birmensdorferstrasse 200, 8003 Zürich, Schweiz]
7  [Birmensdorferstr. 320, 8055 Zürich, Schweiz]
8          [8047 Zürich, Schweiz]
9          [Badenerstr. 310, Zürich, Schweiz]
10         [Badenerstrasse 344, 8004 Zürich, Schweiz]
11         [Uetlibergstrasse 77, 8045 Zürich, Schweiz]
12  [Verena-Conzett-Strasse 21, 8004 Zürich, Schweiz]
13         [Manessestrasse 132, 8045 Zürich, Schweiz]
14  [Birmensdorferstrasse 150 (Schmiede Wiedikon),...
15          [Schweiz]
16          [8045 Zürich, Schweiz]
17         [Badenerstrasse 15, 8004 Zürich, Schweiz]
18         [Uetlibergstrasse 109, 8045 Zürich, Schweiz]
19         [Aegertenstr. 2, 8003 Zürich, Schweiz]
20         [Gertrudstrasse 44, 8003 Zürich, Schweiz]
21          [Schweiz]
22          [Zürich, Schweiz]
23         [Waffenplatzstrasse 63, 8002 Zürich, Schweiz]
24  [Seebahnstrasse 33 (Birmensdorferstrasse), 800...
25          [Schweiz]
26         [Seestrasse 125, 8002 Zürich, Schweiz]
27         [Zweierstrasse 136, 8003 Zürich, Schweiz]
28         [Zentralstrasse 36, 8003 Zürich, Schweiz]
29  [Gertrudstrasse 26, 8003 Zürich, Zürich, Schweiz]
30         [Morgartenstr. 30, 8004 Zürich, Schweiz]
31          [Schweiz]
32  [Birmensdorferstrasse 535, 8055 Zürich, Schweiz]
33          [Schweiz]
34          [Zürich, Schweiz]
35         [Badenerstrasse 217, 8003 Zürich, Schweiz]

```

36 [Zweierstr. 9 (Eingang an der Birmensdorferstr...  
 37 [Werdstr. 75 (Birmensdorferstr.), 8004 Zürich,...  
 38 [Zürich, Schweiz]  
 39 [Badenerstrasse 287 (Zypressenstrasse), 8003 Z...  
 40 [Wasserschöpfli 2 (Friesenbergstrasse), 8055 Z...  
 41 [Hohlstrasse 25 (Langstrasse), 8004 Zürich, Sc...  
 42 [Langstr. 64, 8004 Zürich, Schweiz]  
 43 [Schweiz]  
 44 [Badenerstrasse 357, 8003 Zürich, Schweiz]  
 45 [8004 Zürich, Schweiz]  
 46 [Molkenstrasse 20, 8004 Zürich, Schweiz]  
 47 [Kanzleistrasse 121 (Pflanzschulstr.), 8004 Zü...  
 48 [Hohlstrasse 32, 8004 Zürich, Schweiz]  
 49 [Kochstr. 2, 8004 Zürich, Schweiz]

	crossStreet	neighborhood	id
0	NaN	NaN	5165a91ee4b0c547d16fca83
1	NaN	NaN	4cf3678e7bf3b60cb9d36a7f
2	Hotel Engimatt	NaN	4dcce3bacc3f07eb1efee990
3	Bederstr.	NaN	4b439110f964a5205ce325e3
4	NaN	NaN	4dd64b51d22d38ef42cb0d04
5	Kalandergerasse 1	NaN	4cf5f10c1801a14319b7e6d4
6	NaN	NaN	4c878219e602b1f7f02ec87a
7	NaN	NaN	4d958142c19fb60c7a0a6865
8	NaN	Albisrieden	5b7042d6dff8150039cc3938
9	NaN	Sihlfeld	5236dcb011d2fa11b2b7a442
10	NaN	NaN	4d94d8bcca3f6ea80f3cd334
11	NaN	NaN	4bf65bc494b2a593ae4aadee
12	NaN	NaN	4c7cb5a27a856dcb34f5e2a7
13	NaN	NaN	4b556518f964a52042e327e3
14	Schmiede Wiedikon	NaN	4c30d70366e40f47a31fc48b
15	NaN	NaN	501c4a47e4b0ccb680baecc9
16	NaN	NaN	5aedb0625455b2002cd26a9c
17	NaN	NaN	4cb03a691168a093c9da2823
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19	NaN	NaN	4d543075bdbea1cda337e492
20	NaN	NaN	4b617287f964a520e8132ae3
21	NaN	NaN	4e442d0d1495455b10ca400e
22	NaN	NaN	507fdb50498ef796571afc60
23	NaN	NaN	518a9def498eac03d58fd1de
24	Birmensdorferstrasse	NaN	4c9363fa66dfef3bedff9c03
25	NaN	NaN	4ffa0347e4b083d14d6d414e
26	NaN	NaN	4c0e6a5185e195219379eea5
27	NaN	NaN	4e4b9a3052b1119aaa6f2607
28	NaN	NaN	4efa108893ad7cf2ecb7353a
29	NaN	NaN	4bd9b1b32e6f0f47f7840b08
30	NaN	NaN	4b276e0df964a520618624e3

31		NaN	NaN	514c9ca3e4b07a3d6fe58dda
32		NaN	NaN	509d43bae4b0383a0d519852
33		NaN	NaN	4ca6384fb7106dcb2de05ba5
34		NaN	NaN	4ffea34ee4b042ae8a92e6da
35		NaN	NaN	58727fed02b60e3b69b49ed3
36	Eingang an der Birmensdorferstrasse		NaN	4b058888f964a5200acc22e3
37	Birmensdorferstr.		NaN	4b0a5e0ef964a520922323e3
38		NaN	NaN	4e1d76cdaeb78c0dfeccff4d
39	Zypressenstrasse		NaN	52dd3692498e473cad5d4448
40	Friesenbergstrasse		NaN	4c8297952f1c236a290d3b43
41	Langstrasse		NaN	4b9f78a3f964a520d02437e3
42		NaN	NaN	4b75af9df964a520ee1c2ee3
43		NaN	NaN	5015b2c8e4b097af8b218664
44		NaN	NaN	57e7e535498e0a3992f44a06
45		NaN	NaN	574dc989498eeaadcc4e518f
46		NaN	NaN	5d2f6032ec65e00007eb2a46
47	Pflanzschulstr.		NaN	4be7e915d837c9b623a4a406
48		NaN	NaN	5c8c0ed7e1f2280039304882
49		NaN	NaN	4bb3353c4019a5935c9e37b8

```
[76]: venues_map2 = folium.Map(location=[latitude, longitude], zoom_start=13) #
↳ generate map centred around the Conrad Hotel

# add a red circle marker to represent the Conrad Hotel
folium.features.CircleMarker(
    [latitude, longitude],
    radius=10,
    color='red',
    popup='Kreis3',
    fill = True,
    fill_color = 'red',
    fill_opacity = 0.6
).add_to(venues_map2)

# add the Italian restaurants as blue circle markers
for lat, lng, label in zip(dataframe2_filtered.lat, dataframe2_filtered.lng,
↳ dataframe2_filtered.categories):
    folium.features.CircleMarker(
        [lat, lng],
        radius=5,
        color='blue',
        popup=label,
        fill = True,
        fill_color='blue',
        fill_opacity=0.6
    ).add_to(venues_map2)
```

```
# display map
venues_map2
```

[76]: <folium.folium.Map at 0x7fd9a42954a8>

```
[77]: # KREIS4
search_query = 'restaurant'
radius = 1500
print(search_query + ' .... OK!')
latitude = 47.3775
longitude = 8.521111
url = 'https://api.foursquare.com/v2/venues/search?
      ↪client_id={} & client_secret={} & ll={}, {} & v={} & query={} & radius={} & limit={} '.
      ↪format(CLIENT_ID, CLIENT_SECRET, latitude, longitude, VERSION, search_query,
      ↪radius, LIMIT)
url
```

restaurant ... OK!

[77]: 'https://api.foursquare.com/v2/venues/search?client\_id=RLM401CAFIWXLU00LBV2Z33DT45BIULLHUNEYKMLMR02VUK&client\_secret=D5G4H1H3PSWZTTET3IA05P55H4CJ2X4XWTIKLTBU11QBHQ&ll=47.3775,8.521111&v=20180605&query=restaurant&radius=1500&limit=100'

```
[78]: results3 = requests.get(url).json()
```

```
[79]: # assign relevant part of JSON to venues
venues3 = results3['response']['venues']

# transform venues into a dataframe
dataframe3 = pd.json_normalize(venues3)
dataframe3
```

```
[79]:
```

	id	name \
0	4b7418d2f964a520bcc72de3	Restaurant B
1	56fec063498e86f28f9934ef	Schönau Bar Restaurant
2	4bb0ef7df964a520cb6b3ce3	Restaurant Reithalle
3	4d94d8bcca3f6ea80f3cd334	Hardhof Café & Restaurant
4	5236dcb011d2fa11b2b7a442	Restaurant Nachtjäger
5	4c88b3c9bbec6dcb0fbdd558	Restaurant St. Meinrad
6	4d270450849f37042f726441	Restaurant Stauffachertor
7	4eb2f06130f85a3c6d89de74	Restaurant Valentin's
8	5165a91ee4b0c547d16fca83	Restaurant Hopfenau
9	4f3b6e7fe4b022039bef6654	Restaurant Conrad
10	4cb03a691168a093c9da2823	Coop Restaurant
11	4c7cb5a27a856dcb34f5e2a7	China Restaurant Peking
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13	51039f25e4b026986c9e7dde	Restaurant Pavillon

14	514b7b6ae4b0b5a9c8d79cf6	Restaurant Aura
15	4bbb0667b35776b0837bcb01	Restaurant zum Kropf
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17	4be7e915d837c9b623a4a406	Restaurant La Pergola
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19	4ddcdd1222713339cd1eb94b	Migros Restaurant
20	4f3ecffbe4b0a7d6eb4beec8	EQUINOX Restaurant
21	5437b261498e0d9838a8384b	The Lemon Grass - Thai-Take-Away und Restaurant
22	4d958142c19fb60c7a0a6865	Migros Restaurant
23	4b0f01b0f964a520095e23e3	Panama Bar & Restaurant
24	4b50e513f964a520693727e3	Restaurant Strauss
25	5bba91c8febf31002cda8513	Ege Restaurant
26	4b705b1af964a520e8142de3	Restaurant Pflug
27	4c6bade1599fbe9a602c933f	Restaurant Werkhof
28	4ba35ef0f964a520f73738e3	Globus Restaurant
29	4b75af9df964a520ee1c2ee3	Restaurant Krokodil
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31	4b617287f964a520e8132ae3	Restaurant Idaburg
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41	4bd1c2849854d13a341cfa4d	Restaurant Viadukt
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43	5029793ce4b05f0c00589a0e	Restaurant Scheidegg
44	4bd9b1b32e6f0f47f7840b08	Restaurant Gertrudhof
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46	4b5b54e7f964a5202ef528e3	Restaurant Phillipe
47	50340534e4b02dc8ff961021	Restaurant Sunnehof
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3	Badenerstrasse 344	47.378126	8.510778	

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6	Werdstr. 6	47.372680	8.530370
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8	Hopfenstrasse 19	47.365205	8.519986
9	Sihlstrasse 31	47.372904	8.536534
10	Badenerstrasse 15	47.373675	8.530176
11	Verena-Conzett-Strasse 21	47.370704	8.526782
12	Birmensdorferstrasse 200	47.370746	8.515905
13	Talstrasse 1	47.366800	8.539758
14	NaN	47.368625	8.537483
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16	Waaggasse 4	47.370111	8.539897
17	Kanzleistrasse 121	47.376710	8.520770
18	NaN	47.377493	8.522628
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21	Limmatstrasse 199	47.386877	8.528552
22	Birmensdorferstr. 320	47.369931	8.508418
23	Lettensteg 10	47.385167	8.535383
24	Langstr. 132	47.379668	8.527692
25	Feldstrasse 133, 8004 Zürich, Switzerland	47.380136	8.524460
26	Brauerstr. 74	47.378946	8.524999
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28	Schweizergasse 11	47.375799	8.537430
29	Langstr. 64	47.377392	8.526367
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31	Gertrudstrasse 44	47.373403	8.515037
32	Bäckerstrasse 30	47.379223	8.525918
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34	Kochstr. 2	47.377926	8.516215
35	NaN	47.374410	8.517692
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37	Hohlstrasse 32	47.377278	8.526960
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39	Birmensdorferstrasse 150	47.370125	8.519541
40	NaN	47.376313	8.526625
41	Viaduktstr. 69-71	47.385969	8.522320
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15	Schweiz	[In Gassen 16 (Paradeplatz), 8001 Zürich, Schw...
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21	Schweiz	[Limmatstrasse 199, 8005 Zürich, Schweiz]
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23	Schweiz	[Lettensteg 10, 8037 Zürich, Schweiz]
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36	Schweiz	[Molkenstrasse 20, 8004 Zürich, Schweiz]
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42	Schweiz	[Ausersihleranlage, Zürich, Schweiz]
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45	NaN	NaN	NaN
46	NaN	NaN	NaN
47	NaN	NaN	NaN
48	NaN	NaN	Zypressenstrasse
49	NaN	NaN	NaN

```
[80]: # keep only columns that include venue name, and anything that is associated
      ↪with location
      filtered_columns = ['name', 'categories'] + [col for col in dataframe3.columns
      ↪if col.startswith('location.')] + ['id']
      dataframe3_filtered = dataframe3.loc[:, filtered_columns]

      # function that extracts the category of the venue
      def get_category_type(row):
          try:
              categories_list = row['categories']
          except:
              categories_list = row['venue.categories']

          if len(categories_list) == 0:
              return None
          else:
              return categories_list[0]['name']

      # filter the category for each row
      dataframe3_filtered['categories'] = dataframe3_filtered.
      ↪apply(get_category_type, axis=1)

      # clean column names by keeping only last term
      dataframe3_filtered.columns = [column.split('.')[0] for column in
      ↪dataframe3_filtered.columns]

      dataframe3_filtered
```

[80]:

	name	categories \
0	Restaurant B	Swiss Restaurant
1	Schönau Bar Restaurant	Mediterranean Restaurant
2	Restaurant Reithalle	Swiss Restaurant
3	Hardhof Café & Restaurant	Swiss Restaurant
4	Restaurant Nachtjäger	Swiss Restaurant
5	Restaurant St. Meinrad	Restaurant
6	Restaurant Stauffachertor	Fondue Restaurant
7	Restaurant Valentin's	Turkish Restaurant
8	Restaurant Hopfenau	Restaurant
9	Restaurant Conrad	Diner
10	Coop Restaurant	Breakfast Spot
11	China Restaurant Peking	Chinese Restaurant
12	Coop Restaurant Zürich Wiedikon	Supermarket
13	Restaurant Pavillon	French Restaurant
14	Restaurant Aura	Restaurant
15	Restaurant zum Kropf	Swiss Restaurant
16	Restaurant Heugümper	French Restaurant
17	Restaurant La Pergola	Italian Restaurant
18	Restaurant Caravelle	None
19	Migros Restaurant	Restaurant
20	EQUINOX Restaurant	Restaurant
21	The Lemon Grass - Thai-Take-Away und Restaurant	Thai Restaurant
22	Migros Restaurant	Restaurant
23	Panama Bar & Restaurant	Bar
24	Restaurant Strauss	Restaurant
25	Ege Restaurant	Turkish Restaurant
26	Restaurant Pflug	Restaurant
27	Restaurant Werkhof	Thai Restaurant
28	Globus Restaurant	Swiss Restaurant
29	Restaurant Krokodil	Restaurant
30	Restaurant AX0i	Restaurant
31	Restaurant Idaburg	Restaurant
32	Restaurant Nachtigall	Restaurant
33	Restaurant Biergarten	Beer Garden
34	Restaurant Cafe Boy	Diner
35	Restaurant Ecke	Swiss Restaurant
36	Restaurant Tremundi	Restaurant
37	Restaurant Sonne	Thai Restaurant
38	Restaurant Revan	Restaurant
39	Restaurant Falcone	Italian Restaurant
40	Restaurant Bank	Restaurant
41	Restaurant Viadukt	Mediterranean Restaurant
42	Cafe Bar Restaurant Zebra	Restaurant
43	Restaurant Scheidegg	None
44	Restaurant Gertrudhof	Swiss Restaurant
45	Restaurant JOSEF	Swiss Restaurant

46	Restaurant Phillipe	Diner
47	Restaurant Sunnehof	None
48	Restaurant Rosenburg	Swiss Restaurant
49	Restaurant-Bar Perry	Swiss Restaurant

	address	lat	lng \
0	Hohlstrasse 67	47.377800	8.524277
1	Hohlstrasse 78	47.378234	8.524223
2	Gessner-Allee 8	47.374416	8.534619
3	Badenerstrasse 344	47.378126	8.510778
4	Badenerstr. 310	47.377378	8.512408
5	NaN	47.377554	8.521318
6	Werdstr. 6	47.372680	8.530370
7	Gasometerstrasse 36	47.384740	8.529904
8	Hopfenstrasse 19	47.365205	8.519986
9	Sihlstrasse 31	47.372904	8.536534
10	Badenerstrasse 15	47.373675	8.530176
11	Verena-Conzett-Strasse 21	47.370704	8.526782
12	Birmensdorferstrasse 200	47.370746	8.515905
13	Talstrasse 1	47.366800	8.539758
14	NaN	47.368625	8.537483
15	In Gassen 16	47.370817	8.540020
16	Waaggasse 4	47.370111	8.539897
17	Kanzleistrasse 121	47.376710	8.520770
18	NaN	47.377493	8.522628
19	Löwenstr. 31-35	47.375293	8.536182
20	Turbinenstrasse 20	47.388029	8.514930
21	Limmatstrasse 199	47.386877	8.528552
22	Birmensdorferstr. 320	47.369931	8.508418
23	Lettensteg 10	47.385167	8.535383
24	Langstr. 132	47.379668	8.527692
25	Feldstrasse 133, 8004 Zürih, Switzerland	47.380136	8.524460
26	Brauerstr. 74	47.378946	8.524999
27	Brauerstrasse	47.379529	8.523790
28	Schweizergasse 11	47.375799	8.537430
29	Langstr. 64	47.377392	8.526367
30	Badenerstrasse 217	47.375197	8.517840
31	Gertrudstrasse 44	47.373403	8.515037
32	Bäckerstrasse 30	47.379223	8.525918
33	Hohlstrasse 25	47.376954	8.527221
34	Kochstr. 2	47.377926	8.516215
35	NaN	47.374410	8.517692
36	Molkenstrasse 20	47.376872	8.526771
37	Hohlstrasse 32	47.377278	8.526960
38	Hohlstrasse	47.378264	8.527026
39	Birmensdorferstrasse 150	47.370125	8.519541
40	NaN	47.376313	8.526625

41	Viaduktstr. 69-71	47.385969	8.522320
42	Aussersihleranlage	47.377688	8.522689
43	NaN	47.377200	8.527288
44	Gertrudstrasse 26, 8003 Zürich	47.373791	8.515934
45	Gasometerstr. 24	47.384006	8.529020
46	Brauerstrasse 36	47.377764	8.527290
47	NaN	47.376939	8.528695
48	Badenerstrasse 287	47.377117	8.512784
49	Zentralstrasse 36	47.371853	8.519703

	labeledLatLngs	distance	postalCode \
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1	[{'label': 'display', 'lat': 47.37823394884292...	248	8004
2	[{'label': 'display', 'lat': 47.37441567682283...	1074	8001
3	[{'label': 'display', 'lat': 47.37812551106540...	782	8004
4	[{'label': 'display', 'lat': 47.37737792805111...	656	NaN
5	[{'label': 'display', 'lat': 47.37755432530285...	16	NaN
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7	[{'label': 'display', 'lat': 47.384740237094, ...	1043	8005
8	[{'label': 'display', 'lat': 47.36520492776915...	1371	8045
9	[{'label': 'display', 'lat': 47.372904, 'lng':...	1270	8001
10	[{'label': 'display', 'lat': 47.373675, 'lng':...	805	8004
11	[{'label': 'display', 'lat': 47.3707036211175,...	869	8004
12	[{'label': 'display', 'lat': 47.37074636, 'lng'...	848	8003
13	[{'label': 'display', 'lat': 47.36679998927440...	1842	8001
14	[{'label': 'display', 'lat': 47.3686249034138,...	1580	NaN
15	[{'label': 'display', 'lat': 47.37081690089162...	1607	8001
16	[{'label': 'display', 'lat': 47.37011141634336...	1637	8001
17	[{'label': 'display', 'lat': 47.37671, 'lng': ...	91	8004
18	[{'label': 'display', 'lat': 47.377493, 'lng':...	114	NaN
19	[{'label': 'display', 'lat': 47.37529338068069...	1162	8001
20	[{'label': 'display', 'lat': 47.38802859308482...	1261	8005
21	[{'label': 'display', 'lat': 47.38687727186179...	1184	8005
22	[{'label': 'display', 'lat': 47.36993134937684...	1274	8055
23	[{'label': 'display', 'lat': 47.38516656631587...	1373	8037
24	[{'label': 'display', 'lat': 47.37966789738526...	551	8004
25	[{'label': 'display', 'lat': 47.380136, 'lng':...	387	8004
26	[{'label': 'display', 'lat': 47.37894572084740...	334	8004
27	[{'label': 'display', 'lat': 47.379529, 'lng':...	302	NaN
28	[{'label': 'display', 'lat': 47.37579939274855...	1244	8001
29	[{'label': 'display', 'lat': 47.37739154895993...	396	8004
30	[{'label': 'display', 'lat': 47.375197, 'lng':...	355	8003
31	[{'label': 'display', 'lat': 47.373403, 'lng':...	646	8003
32	[{'label': 'display', 'lat': 47.37922348229873...	410	8004
33	[{'label': 'display', 'lat': 47.37695434, 'lng'...	464	8004
34	[{'label': 'display', 'lat': 47.37792578601071...	372	8004
35	[{'label': 'display', 'lat': 47.37441, 'lng': ...	429	NaN



36	[{'label': 'display', 'lat': 47.376872, 'lng':...	432	8004
37	[{'label': 'display', 'lat': 47.377278, 'lng':...	441	8004
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39	[{'label': 'display', 'lat': 47.37012477458556...	829	8003
40	[{'label': 'display', 'lat': 47.376313, 'lng':...	436	8004
41	[{'label': 'display', 'lat': 47.38596946208108...	947	8005
42	[{'label': 'display', 'lat': 47.37768792918503...	120	NaN
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46	[{'label': 'display', 'lat': 47.37776376891414...	466	NaN
47	[{'label': 'display', 'lat': 47.376939, 'lng':...	575	NaN
48	[{'label': 'display', 'lat': 47.37711716608911...	629	8003
49	[{'label': 'display', 'lat': 47.371853, 'lng':...	637	8003

	cc	city	state	country \
0	CH	Zürich	Zürich	Schweiz
1	CH	Zürich	Zürich	Schweiz
2	CH	Zürich	Zürich	Schweiz
3	CH	Zürich	Zürich	Schweiz
4	CH	Zürich	Zürich	Schweiz
5	CH	Zürich	Zürich	Schweiz
6	CH	Zürich	Zürich	Schweiz
7	CH	Zürich	Zürich	Schweiz
8	CH	Zürich	Zürich	Schweiz
9	CH	Zürich	Zürich	Schweiz
10	CH	Zürich	Zürich	Schweiz
11	CH	Zürich	Zürich	Schweiz
12	CH	Zürich	Zürich	Schweiz
13	CH	Zürich	Zürich	Schweiz
14	CH	Zürich	Zürich	Schweiz
15	CH	Zürich	Zürich	Schweiz
16	CH	Zürich	Zürich	Schweiz
17	CH	Zürich	Zürich	Schweiz
18	CH	NaN	NaN	Schweiz
19	CH	Zürich	Zürich	Schweiz
20	CH	Zürich	Zürich	Schweiz
21	CH	Zürich	Zürich	Schweiz
22	CH	Zürich	Zürich	Schweiz
23	CH	Zürich	Zürich	Schweiz
24	CH	Zürich	Zürich	Schweiz
25	CH	Zürich	Zürich	Schweiz
26	CH	Zürich	Zürich	Schweiz
27	CH	Zürich	Zürich	Schweiz
28	CH	Zürich	Zürich	Schweiz
29	CH	Zürich	Zürich	Schweiz
30	CH	Zürich	Zürich	Schweiz

31	CH	Zürich	Zürich	Schweiz
32	CH	Zürich	Zürich	Schweiz
33	CH	Zürich	Zürich	Schweiz
34	CH	Zürich	Zürich	Schweiz
35	CH	NaN	NaN	Schweiz
36	CH	Zürich	Zürich	Schweiz
37	CH	Zürich	Zürich	Schweiz
38	CH	Zürich	Zürich	Schweiz
39	CH	Zürich	Zürich	Schweiz
40	CH	Zürich	Zürich	Schweiz
41	CH	Zürich	Zürich	Schweiz
42	CH	Zürich	Zürich	Schweiz
43	CH	NaN	NaN	Schweiz
44	CH	Zürich	Zürich	Schweiz
45	CH	Zürich	Zürich	Schweiz
46	CH	Zürich	Zürich	Schweiz
47	CH	NaN	NaN	Schweiz
48	CH	Zürich	Zürich	Schweiz
49	CH	Zürich	Zürich	Schweiz

	formattedAddress	neighborhood	\
0	[Hohlstrasse 67, 8004 Zürich, Schweiz]	NaN	
1	[Hohlstrasse 78, 8004 Zürich, Schweiz]	NaN	
2	[Gessner-Allee 8, 8001 Zürich, Schweiz]	NaN	
3	[Badenerstrasse 344, 8004 Zürich, Schweiz]	NaN	
4	[Badenerstr. 310, Zürich, Schweiz]	Sihlfeld	
5	[Zürich, Schweiz]	NaN	
6	[Werdstr. 6, 8004 Zürich, Schweiz]	NaN	
7	[Gasometerstrasse 36, 8005 Zürich, Schweiz]	NaN	
8	[Hopfenstrasse 19, 8045 Zürich, Schweiz]	NaN	
9	[Sihlstrasse 31 (Hotel Glockenhof), 8001 Züric...	City	
10	[Badenerstrasse 15, 8004 Zürich, Schweiz]	NaN	
11	[Verena-Conzett-Strasse 21, 8004 Zürich, Schweiz]	NaN	
12	[Birmensdorferstrasse 200, 8003 Zürich, Schweiz]	NaN	
13	[Talstrasse 1, 8001 Zürich, Schweiz]	NaN	
14	[Zürich, Schweiz]	NaN	
15	[In Gassen 16 (Paradeplatz), 8001 Zürich, Schw...	NaN	
16	[Waaggasse 4, 8001 Zürich, Schweiz]	NaN	
17	[Kanzleistrasse 121 (Pflanzschulstr.), 8004 Zü...	NaN	
18	[Schweiz]	NaN	
19	[Löwenstr. 31-35, 8001 Zürich, Schweiz]	NaN	
20	[Turbinenstrasse 20, 8005 Zürich, Schweiz]	NaN	
21	[Limmatstrasse 199, 8005 Zürich, Schweiz]	NaN	
22	[Birmensdorferstr. 320, 8055 Zürich, Schweiz]	NaN	
23	[Lettensteg 10, 8037 Zürich, Schweiz]	NaN	
24	[Langstr. 132, 8004 Zürich, Schweiz]	NaN	
25	[Feldstrasse 133, 8004 Zürih, Switzerland (Lan...	NaN	

26	[Brauerstr. 74, 8004 Zürich, Schweiz]	Kreis 4
27	[Brauerstrasse, Zürich, Schweiz]	NaN
28	[Schweizergasse 11, 8001 Zürich, Schweiz]	NaN
29	[Langstr. 64, 8004 Zürich, Schweiz]	NaN
30	[Badenerstrasse 217, 8003 Zürich, Schweiz]	NaN
31	[Gertrudstrasse 44, 8003 Zürich, Schweiz]	NaN
32	[Bäckerstrasse 30, 8004 Zürich, Schweiz]	NaN
33	[Hohlstrasse 25 (Langstrasse), 8004 Zürich, Sc...	NaN
34	[Kochstr. 2, 8004 Zürich, Schweiz]	NaN
35	[Schweiz]	NaN
36	[Molkenstrasse 20, 8004 Zürich, Schweiz]	NaN
37	[Hohlstrasse 32, 8004 Zürich, Schweiz]	NaN
38	[Hohlstrasse, Zürich, Schweiz]	NaN
39	[Birmensdorferstrasse 150 (Schmiede Wiedikon),...	NaN
40	[8004 Zürich, Schweiz]	NaN
41	[Viaduktstr. 69-71, 8005 Zürich, Schweiz]	NaN
42	[Ausersihleranlage, Zürich, Schweiz]	NaN
43	[Schweiz]	NaN
44	[Gertrudstrasse 26, 8003 Zürich, Zürich, Schweiz]	NaN
45	[Gasometerstr. 24, 8005 Zürich, Schweiz]	NaN
46	[Brauerstrasse 36, Zürich, Schweiz]	NaN
47	[Schweiz]	NaN
48	[Badenerstrasse 287 (Zypressenstrasse), 8003 Z...	NaN
49	[Zentralstrasse 36, 8003 Zürich, Schweiz]	NaN

	crossStreet	id
0	NaN	4b7418d2f964a520bcc72de3
1	NaN	56fec063498e86f28f9934ef
2	NaN	4bb0ef7df964a520cb6b3ce3
3	NaN	4d94d8bcca3f6ea80f3cd334
4	NaN	5236dcb011d2fa11b2b7a442
5	NaN	4c88b3c9bbec6dcb0fbdd558
6	NaN	4d270450849f37042f726441
7	NaN	4eb2f06130f85a3c6d89de74
8	NaN	5165a91ee4b0c547d16fca83
9	Hotel Glockenhof	4f3b6e7fe4b022039bef6654
10	NaN	4cb03a691168a093c9da2823
11	NaN	4c7cb5a27a856dcb34f5e2a7
12	NaN	4c878219e602b1f7f02ec87a
13	NaN	51039f25e4b026986c9e7dde
14	NaN	514b7b6ae4b0b5a9c8d79cf6
15	Paradeplatz	4bbb0667b35776b0837bcb01
16	NaN	4cdbe87c5aeda1cdfb7fbf11
17	Pflanzschulstr.	4be7e915d837c9b623a4a406
18	NaN	5015b2c8e4b097af8b218664
19	NaN	4ddcdd1222713339cd1eb94b
20	NaN	4f3ecffbe4b0a7d6eb4beec8

21		NaN	5437b261498e0d9838a8384b
22		NaN	4d958142c19fb60c7a0a6865
23		NaN	4b0f01b0f964a520095e23e3
24		NaN	4b50e513f964a520693727e3
25	Langstrasse		5bba91c8febf31002cda8513
26		NaN	4b705b1af964a520e8142de3
27		NaN	4c6bade1599fbe9a602c933f
28		NaN	4ba35ef0f964a520f73738e3
29		NaN	4b75af9df964a520ee1c2ee3
30		NaN	58727fed02b60e3b69b49ed3
31		NaN	4b617287f964a520e8132ae3
32		NaN	554e9fcc498e1d5fa7db4a1a
33	Langstrasse		4b9f78a3f964a520d02437e3
34		NaN	4bb3353c4019a5935c9e37b8
35		NaN	4ca6384fb7106dcb2de05ba5
36		NaN	5d2f6032ec65e00007eb2a46
37		NaN	5c8c0ed7e1f2280039304882
38		NaN	4eb809924901cef9d9a061a7
39	Schmiede Wiedikon		4c30d70366e40f47a31fc48b
40		NaN	574dc989498eeaadcc4e518f
41		NaN	4bd1c2849854d13a341cfa4d
42		NaN	4f213f65e4b0cebcfb128827
43		NaN	5029793ce4b05f0c00589a0e
44		NaN	4bd9b1b32e6f0f47f7840b08
45		NaN	4b058888f964a520f8cb22e3
46		NaN	4b5b54e7f964a5202ef528e3
47		NaN	50340534e4b02dc8ff961021
48	Zypressenstrasse		52dd3692498e473cad5d4448
49		NaN	4efa108893ad7cf2ecb7353a

```
[81]: venues_map3 = folium.Map(location=[latitude, longitude], zoom_start=13) #
      ↪ generate map centred around the Conrad Hotel

# add a red circle marker to represent the Conrad Hotel
folium.features.CircleMarker(
    [latitude, longitude],
    radius=10,
    color='red',
    popup='Kreis4',
    fill = True,
    fill_color = 'red',
    fill_opacity = 0.6
).add_to(venues_map3)

# add the Italian restaurants as blue circle markers
for lat, lng, label in zip(dataframe3_filtered.lat, dataframe3_filtered.lng,
      ↪ dataframe3_filtered.categories):
```

```

folium.features.CircleMarker(
    [lat, lng],
    radius=5,
    color='blue',
    popup=label,
    fill = True,
    fill_color='blue',
    fill_opacity=0.6
).add_to(venues_map3)

# display map
venues_map3

```

[81]: <folium.folium.Map at 0x7fd9a42d12b0>

```

[85]: ZRH1 = dataframe_filtered
      ZRH1 = ZRH1.append (dataframe1_filtered)
      ZRH1 = ZRH1.append (dataframe2_filtered)
      ZRH1 = ZRH1.append (dataframe3_filtered)
      ZRH1.head()
      ZRH1.shape

```

[85]: (125, 16)

[86]: ZRH1.head()

```

[86]:

```

		name	categories \
0		Food from Farmers	Burger Joint
1		Jelmoli Food Market	Market
2		Hong-Kong Food Paradise	Chinese Restaurant
3		Food Station	Food Court
4	Coop Supermarkt City Zürich St. Annahof	Food	None

  

	address	crossStreet	lat	lng \
0	Langstrasse 211	Josefstrasse	47.368502	8.545671
1	NaN	NaN	47.374083	8.537229
2	Seidengasse 1	NaN	47.374042	8.536562
3	Bahnhofplatz 15	NaN	47.378204	8.535982
4	Bahnhofstrasse 57	NaN	47.372902	8.538024

  

	labeledLatLngs	distance	postalCode	cc \
0	[{'label': 'display', 'lat': 47.36850193220842...}	360	8005	CH
1	[{'label': 'display', 'lat': 47.3740827107709,...}	539	NaN	CH
2	[{'label': 'display', 'lat': 47.37404169003569...}	568	8001	CH
3	[{'label': 'display', 'lat': 47.378204, 'lng':...}	980	NaN	CH
4	[{'label': 'display', 'lat': 47.37290177, 'lng...}	400	8001	CH

	city	state	country	formattedAddress \
0	Zürich	Zürich	Schweiz	[Langstrasse 211 (Josefstrasse), 8005 Zürich, ...
1	NaN	NaN	Schweiz	[Schweiz]
2	Zürich	Zürich	Schweiz	[Seidengasse 1, 8001 Zürich, Schweiz]
3	NaN	NaN	Schweiz	[Bahnhofplatz 15, Schweiz]
4	Zürich	Zürich	Schweiz	[Bahnhofstrasse 57, 8001 Zürich, Schweiz]

  

	neighborhood	id
0	NaN	560595f7498eb0f06171956e
1	NaN	5357cc16498e0e40db63f54a
2	NaN	4e87185182316be403a7f640
3	NaN	5bac7c428b98fd0039448a15
4	NaN	5cc1c6a4cabcff002ce22ad4

```
[88]: venues_map4 = folium.Map(location=[latitude, longitude], zoom_start=13) #
      ↪ generate map centred around the Conrad Hotel

# add the Italian restaurants as blue circle markers
for lat, lng, label in zip(dataframe_filtered.lat, dataframe_filtered.lng,
      ↪ dataframe_filtered.categories):
    folium.features.CircleMarker(
        [lat, lng],
        radius=5,
        color='blue',
        popup=label,
        fill = True,
        fill_color='blue',
        fill_opacity=0.6
    ).add_to(venues_map4)
for lat, lng, label in zip(dataframe1_filtered.lat, dataframe1_filtered.lng,
      ↪ dataframe1_filtered.categories):
    folium.features.CircleMarker(
        [lat, lng],
        radius=5,
        color='red',
        popup=label,
        fill = True,
        fill_color='red',
        fill_opacity=0.6
    ).add_to(venues_map4)
for lat, lng, label in zip(dataframe2_filtered.lat, dataframe2_filtered.lng,
      ↪ dataframe2_filtered.categories):
    folium.features.CircleMarker(
        [lat, lng],
        radius=5,
        color='orange',
```

```

        popup=label,
        fill = True,
        fill_color='orange',
        fill_opacity=0.6
    ).add_to(venues_map4)

for lat, lng, label in zip(dataframe3_filtered.lat, dataframe3_filtered.lng,
    ↪dataframe3_filtered.categories):
    folium.features.CircleMarker(
        [lat, lng],
        radius=5,
        color='green',
        popup=label,
        fill = True,
        fill_color='green',
        fill_opacity=0.6
    ).add_to(venues_map4)

# display map
venues_map4

```

[88]: <folium.folium.Map at 0x7fd99f7191d0>

[ ]: