A new cafeteria in Mexico City

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Introduction

Mexico City is a one of the most representative cities in this country, where food, arquitecture and design are all in one place. Each neighborhoods has something to offer. In this notebook we will try to find the best possible location for a new cafeteria. With a population of 8.855 million in 2015 and an area of 1,485 million kilometers squared is one of the most denses cities in the world. Mexico city is also a beatiful city for tourism where people are eager to know the culture through its famous dishes.

This report is specially targeted to stakeholders interested in opening a new cafeteria in **Mexico City** . We would try to find the best location in terms of competition and income of neighborhoods.

In ordet to solve this problem we would use the **Foursquare API** to adquire the data and use data science techniques to clean it and analyze it.

Data

Given the nature of our problem we are intereste in:

- All cafeterias in a specific zone

Code

In [1]:
```
#Import libraries

import requests
import pandas as pd
import numpy as np
from geopy.geocoders import Nominatim
from IPython.display import Image
from IPython.core.display import HTML
from pandas.io.json import json_normalize
import folium
```

Download and clean data

In order to use the data we will use pgeocode a library "for high performance off-line querying of GPS coordinates, region name and municipality name from postal codes"

In [4]:
```
#Parameters

request_parameters = {
    "client_id": CLIENT_ID,
    "client_secret": CLIENT_SECRET,
    "v": '20210301', #Format YYYYMMDD
    "section": "coffee", #Type of stablishment
    "near": "Mexico City",
    "radius": 100000,
    "limit": 50}

#Request data

data = requests.get("https://api.foursquare.com/v2/venues/explore", params=request_parameters)
```

In [5]:
```
#Data to json

d = data.json()["response"]

#Name of keys
d.keys()
```

Out[5]:
```
dict_keys(['suggestedFilters', 'geocode', 'headerLocation', 'headerFullLocation', 'headerLocationGran
ularity', 'query', 'totalResults', 'suggestedBounds', 'groups'])
```

In [6]:
```
#Locations

d["headerLocationGranularity"], d["headerLocation"], d["headerFullLocation"]
```

Out[6]:
```
('city', 'Mexico City', 'Mexico City')
```

In [7]:
```
#Limits

d["suggestedBounds"], d["totalResults"]
```

Out[7]:
```
({'ne': {'lat': 19.495981200806472, 'lng': -99.07831137006355},
  'sw': {'lat': 19.339679199433984, 'lng': -99.21100724615988}},
 224)
```

In [8]:
```
#Geocode information usefel for folium

d["geocode"]
```

Out[8]:
```
{'what': '',
 'where': 'mexico city',
 'center': {'lat': 19.42847, 'lng': -99.12766},
 'displayString': 'Mexico City, DF, Mexico',
 'cc': 'MX',
 'geometry': {'bounds': {'ne': {'lat': 19.515304989460464,
    'lng': -99.05579900650167},
   'sw': {'lat': 19.356858007471764, 'lng': -99.25983899084375}}},
 'slug': 'mexico-city',
 'longId': '72057594041458533'}
```

In [9]:
```
d["groups"][0].keys()
```

Out[9]:
```
dict_keys(['type', 'name', 'items'])
```

In [10]:
```
d["groups"][0]["type"], d["groups"][0]["name"]
```

Out[10]:
```
('Recommended Places', 'recommended')
```

In [11]:
```
items = d["groups"][0]["items"]
print("number of items: %i" % len(items))
items[0]
```

```
number of items: 50
```

Out[11]:
```
{'reasons': {'count': 0,
  'items': [{'summary': 'This spot is popular',
    'type': 'general',
    'reasonName': 'globalInteractionReason'}]},
 'venue': {'id': '57d9af4c498eb1f22a68d455',
  'name': 'Tierra Garat',
  'location': {'address': 'Amberes 33',
   'crossStreet': 'Hamburgo',
   'lat': 19.425898829574308,
   'lng': -99.16557479536033,
   'labeledLatLngs': [{'label': 'display',
     'lat': 19.425898829574308,
     'lng': -99.16557479536033}],
   'cc': 'MX',
   'neighborhood': 'Juárez',
   'city': 'Ciudad de México',
   'state': 'Distrito Federal',
   'country': 'México',
   'formattedAddress': ['Amberes 33 (Hamburgo)',
    'Ciudad de México, Distrito Federal',
    'México']},
  'categories': [{'id': '4bf58dd8d48988d1e0931735',
    'name': 'Coffee Shop',
    'pluralName': 'Coffee Shops',
    'shortName': 'Coffee Shop',
    'icon': {'prefix': 'https://ss3.4sqi.net/img/categories_v2/food/coffeeshop_',
     'suffix': '.png'},
    'primary': True}],
  'photos': {'count': 0, 'groups': []}},
 'referralId': 'e-5-57d9af4c498eb1f22a68d455-0'}
```

In [12]:
```
items[1]
```

Out[12]:
```
{'reasons': {'count': 0,
  'items': [{'summary': 'This spot is popular',
    'type': 'general',
    'reasonName': 'globalInteractionReason'}]},
 'venue': {'id': '540673ad498e44dafcaed029',
  'name': 'Casa Tassel',
  'location': {'address': 'Córdoba 110',
   'lat': 19.418051,
   'lng': -99.158343,
   'labeledLatLngs': [{'label': 'display',
     'lat': 19.418051,
     'lng': -99.158343}],
   'postalCode': '06700',
   'cc': 'MX',
   'neighborhood': 'Roma Norte',
   'city': 'Ciudad de México',
   'state': 'Distrito Federal',
   'country': 'México',
   'formattedAddress': ['Córdoba 110',
    '06700 Ciudad de México, Distrito Federal',
    'México']},
  'categories': [{'id': '4bf58dd8d48988d1dc931735',
    'name': 'Tea Room',
    'pluralName': 'Tea Rooms',
    'shortName': 'Tea Room',
    'icon': {'prefix': 'https://ss3.4sqi.net/img/categories_v2/food/tearoom_',
     'suffix': '.png'},
    'primary': True}],
  'photos': {'count': 0, 'groups': []},
  'venuePage': {'id': '440206039'}},
 'referralId': 'e-5-540673ad498e44dafcaed029-1'}
```

In [15]:
```
#Information for cafeterias

df_raw = []
for item in items:
    venue = item["venue"]
    categories, uid, name, location = venue["categories"], venue["id"], venue["name"], venue["location"
]
    assert len(categories) == 1
    shortname = categories[0]["shortName"]
    #address = location["address"]
    if not "postalCode" in location:
        continue
    postalcode = location["postalCode"]
    lat = location["lat"]
    lng = location["lng"]
    datarow = (uid, name, shortname, address, postalcode, lat, lng)
    df_raw.append(datarow)
df = pd.DataFrame(df_raw, columns=["uid", "name", "shortname", "address", "postalcode", "lat", "lng"])
print("Found %i cafes" % len(df))
```

```
Found 41 cafes
```

In [16]:
```
#Dataframe info

df
```

Out[16]:

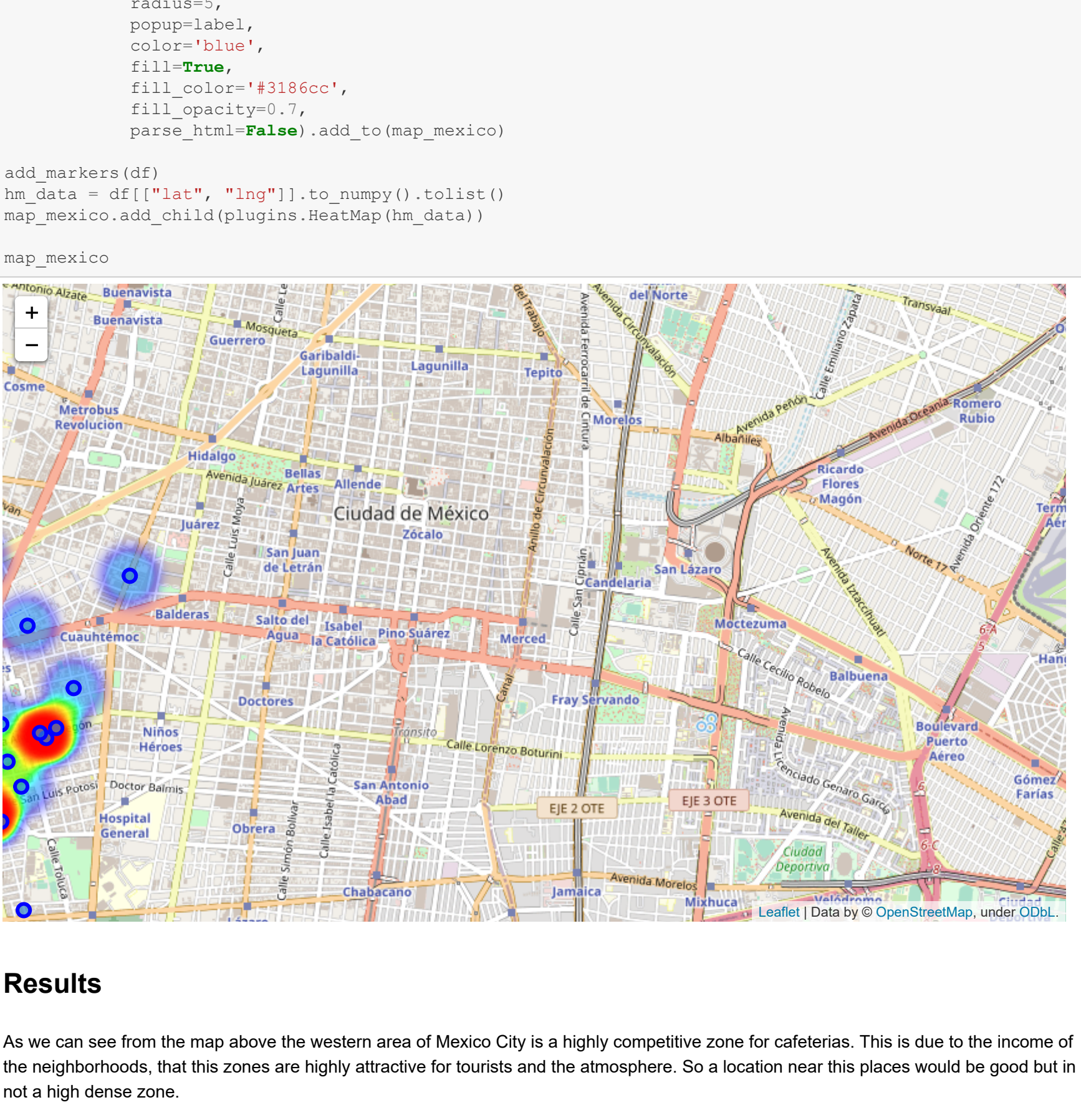
	uid	name	shortname	address	postalcode	lat	lng
0	540673ad498e44dafcaed029	Casa Tassel	Tea Room	Álvaro Obregón 86	06700	19.418051	-99.158343
1	51ba6ba9498e9bcd16eee9ec	Cachito Mío Quiches & Tartas	Coffee Shop	Álvaro Obregón 86	06700	19.416528	-99.160931
2	56d76bac498ecdce6449901f	Tierra Garat	Coffee Shop	Álvaro Obregón 86	06700	19.418890	-99.161417
3	566c4847498e1bdb149c56b0	Qūentin Café	Café	Álvaro Obregón 86	06700	19.418648	-99.157651
4	57f56557498ef66f03d1da46	MARI'S PASTRY shop & taller	Coffee Shop	Álvaro Obregón 86	03020	19.394866	-99.159646
5	5b78d0bec9f907002c032d78	Tierra Garat	Coffee Shop	Álvaro Obregón 86	03100	19.388341	-99.171675
6	58421d7ef63c54143e54022f	Café Curado	Coffee Shop	Álvaro Obregón 86	06700	19.421470	-99.164129
7	5203c4da7dd20c1ba1ab8f13	Tomás - Casa Editora de Té	Tea Room	Álvaro Obregón 86	06100	19.411991	-99.173480
8	5ccda78616fa040039513084	Cafe Baveno	Café	Álvaro Obregón 86	06700	19.413537	-99.162881
9	58e2f685e03e574fc4fcfd28	Tierra Garat	Café	Álvaro Obregón 86	06100	19.410158	-99.172554
10	5504ab10498e3c6d80a96624	Boba Fusion Tea Bar	Tea Room	Álvaro Obregón 86	06700	19.417247	-99.166014
11	536d49b9498e297074612d1d	Otro Café	Café	Álvaro Obregón 86	11590	19.428610	-99.177349
12	5833664d4bc2f12d12a68ef8	Cardinal	Café	Álvaro Obregón 86	06100	19.409256	-99.173757
13	4d482eabea3f3704dd06280a	Cafebrería El Péndulo	Coffee Shop	Álvaro Obregón 86	06700	19.418386	-99.158744
14	50c7dcc0e4b0b162a541cec6	Tierra Garat	Coffee Shop	Álvaro Obregón 86	06500	19.429647	-99.163030
15	519103e98bbd3569534f11ac	Café Memorias de un Barista	Coffee Shop	Álvaro Obregón 86	06700	19.421249	-99.156400
16	5859666ce309e14c46b5fbd6	Blend Station	Coffee Shop	Álvaro Obregón 86	06100	19.412011	-99.173225
17	5956dbd495a72203b05926e3	Churrería El Moro	Coffee Shop	Álvaro Obregón 86	06100	19.411109	-99.168823
18	578e5a5c498e57a5d7d44412a	F/i Farmacia Internacional	Café	Álvaro Obregón 86	06010	19.428560	-99.152531
19	59336cd6a4b51b08124e1fa2	BLOM Café	Coffee Shop	Álvaro Obregón 86	06600	19.425323	-99.159606
20	56e8bb76498e7e8b526b0cde	Paradigma Café	Café	Álvaro Obregón 86	06700	19.413112	-99.164120
21	4f5695bfd5fb8714b13e9630	Cucurucho	Café	Álvaro Obregón 86	06500	19.432355	-99.167027
22	5892bae9469aef72f398f23e	Forte Bread & Coffee	Coffee Shop	Álvaro Obregón 86	06400	19.414875	-99.159986
23	55c8d78b498e7e9a80857277	Brown Caffeine Lab	Café	Álvaro Obregón 86	06760	19.406822	-99.159828
24	5c37a6b5135b39002cc5d831	Tierra Garat	Coffee Shop	Álvaro Obregón 86	11560	19.434279	-99.187837
25	56a27986498eadfd1c14252b	Fortunata Café	Coffee Shop	Álvaro Obregón 86	04020	19.346784	-99.160447
26	5971649fdab4b134905e85d1	7 Café Barra De Especialidad	Café	Álvaro Obregón 86	03020	19.390827	-99.155640
27	59e2d93e0d8a0f671eb0bf10	Krispy Kream Liverpool Delta	Donuts	Álvaro Obregón 86	03000	19.403544	-99.155079
28	52a4dc5711d2503a6df390e2	CUCURUCHO	Coffee Shop	Álvaro Obregón 86	06700	19.412620	-99.161390
29	551c2bf6498e1cf926bbbe0e	Cielito Querido Café	Café	Álvaro Obregón 86	07300	19.488877	-99.127992
30	5a15beabf96b2c105ebbe75a	Starbucks	Coffee Shop	Álvaro Obregón 86	03810	19.396172	-99.179654
31	5360649d498edcad36243dde	Shaktea	Tea Room	Álvaro Obregón 86	06100	19.406333	-99.170808
32	4f5146f2e4b06025e79403d3	Chiquitito	Coffee Shop	Álvaro Obregón 86	06100	19.406895	-99.173017
33	586edee15e56b41e0a303c69	Cleotilde	Coffee Shop	Álvaro Obregón 86	11800	19.402134	-99.171606
34	5a0e1d028194fc76a74db3a5	Maison Kayser	Coffee Shop	Álvaro Obregón 86	11550	19.436157	-99.204976
35	55a2b168498e873deaff9378	Hey! Brew Bar	Café	Álvaro Obregón 86	03810	19.392193	-99.179207
36	58f419e351950e59f0648e77	Cielito Querido Café	Coffee Shop	Álvaro Obregón 86	07760	19.484001	-99.132998
37	596f855a59fe5c3ad76e4112	Punta Del Cielo Alta Extraccion	Coffee Shop	Álvaro Obregón 86	11550	19.431549	-99.191732
38	5895310e0b565650436282bf	Té Cuento	Tea Room	Álvaro Obregón 86	03104	19.377883	-99.171250
39	4e07a879b0fbba5eee1db693	Café Avellaneda	Café	Álvaro Obregón 86	04020	19.348300	-99.160814
40	5aaa867bb5461808488ccb40	Latente Café	Café	Álvaro Obregón 86	03230	19.367725	-99.177624

In [17]:
```
#Folium center

city_center = d["geocode"]["center"]
city_center
```

Out[17]:
```
{'lat': 19.42847, 'lng': -99.12766}
```

In [22]:
```
import folium
import numpy
from folium import plugins

#map
map_mexico = folium.Map(location=[city_center["lat"], city_center["lng"]], zoom_start=14)

def add_markers(df):
    for (j, row) in df.iterrows():
        label = folium.Popup(row["name"], parse_html=True)
        folium.CircleMarker(
            [row["lat"], row["lng"]],
            radius=5,
            popup=label,
            color='blue',
            fill=True,
            fill_color='#3186cc',
            fill_opacity=0.7,
            parse_html=False).add_to(map_mexico)

add_markers(df)
hm_data = df[["lat", "lng"]].to_numpy().tolist()
map_mexico.add_child(plugins.HeatMap(hm_data))

map_mexico
```

Out[22]:



Results

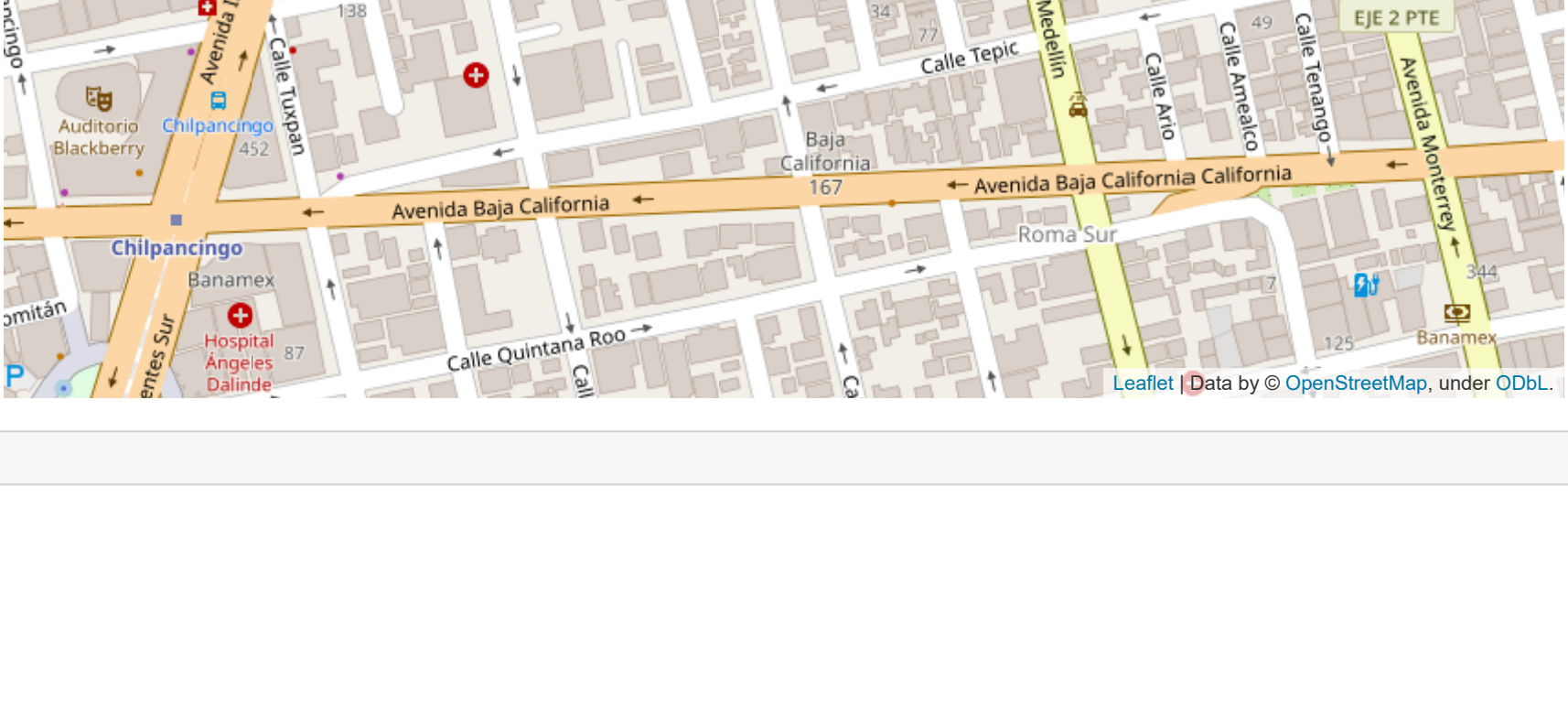
As we can see from the map above the western area of Mexico City is a highly competitive zone for cafeterias. This is due to the income of the neighborhoods, that this zones are highly attractive for tourists and the atmosphere. So a location near this places would be good but in not a high dense zone.

Conclusion

We can see that between Calle Tepic an Calle Tapachila there is not a single cafeteria, and there is a Hospital in this zone. This hospital represents a lot of potential clients.

In [26]:
```
lat = 19.407716973314567
lng = -99.16533300857152
map_mexico = folium.Map(location=[lat, lng], zoom_start=17)
add_markers(df)
folium.CircleMarker(
    [lat, lng],
    radius=15,
    popup="Our New Cafe!",
    color='red',
    fill=True,
    fill_color='blue',
    fill_opacity=0.7,
    parse_html=False).add_to(map_mexico)
map_mexico
```

Out[26]:



In [ ]: