

Selling a house in Mexico City

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Introduction

Mexico City is a one of the most representative cities in this country, where food, architecture 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 restaurant. 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 beautiful 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 restaurant 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

In [4]: #Parameters

request_parameters = {
    "client_id": CLIENT_ID,
    "client_secret": CLIENT_SECRET,
    "v": '20210301', #Format YYYYMMDD
    "section": "coffee", #Type of establishment
    "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', 'headerLocationGranularity', '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'}]},
'venu': {'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'}]},
'venu': {'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': []},
'venuPage': {'id': '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 51ba6b9a498ebdcd16ee99ec Cachito Mio Quiches & Tartas Coffee Shop Álvaro Obregón 86 06700 19.416528 -99.160931
2 56d76bac498ecdc6449901f Tierra Garat Coffee Shop Álvaro Obregón 86 06700 19.418890 -99.161417
3 566c4847498e1bdc149c56b0 Qüentin Café Café Álvaro Obregón 86 06700 19.418648 -99.157651
4 57f56557498ef6f03d1da46 MARI'S PASTRY shop & taller Coffee Shop Álvaro Obregón 86 03020 19.394866 -99.159646
5 5b78d0fec9f907002c032d78 Tierra Garat Coffee Shop Álvaro Obregón 86 03100 19.388341 -99.171675
6 58421d7f6dc5c4143e54022f Café Curado Coffee Shop Álvaro Obregón 86 06700 19.421470 -99.164129
7 5203cd4da7498e20c1ba1abf13 Tomás - Casa Editora de Té Tea Room Álvaro Obregón 86 06100 19.411991 -99.173480
8 5c0da78616fa040039513084 Cafe Baveno Café Álvaro Obregón 86 06700 19.413537 -99.162881
9 58e2685e963e574fc4fcd28 Tierra Garat Café Álvaro Obregón 86 06100 19.410158 -99.172554
10 5504ab10498e3c8d80a9a6224 Boba Fusion Tea Bar Tea Room Álvaro Obregón 86 06700 19.417247 -99.166014
11 536c49b498e297074612d1d Otro Café Café Álvaro Obregón 86 11590 19.428610 -99.177349
12 5833664d4bc2f12d12a68ef8 Cardinal Café Álvaro Obregón 86 06100 19.409256 -99.173757
13 44462eab9a33704d0d6280a Cafebreria El Péndulo Coffee Shop Álvaro Obregón 86 06700 19.418386 -99.158744
14 50c7dcd0e4b0b162a541cec6f Tierra Garat Coffee Shop Álvaro Obregón 86 06500 19.429647 -99.163030
15 519103e98b8b356953411ac Café Memorias de un Barista Coffee Shop Álvaro Obregón 86 06700 19.425323 -99.156400
16 5859686ca309e14c46b5bdc6 Blend Station Coffee Shop Álvaro Obregón 86 06100 19.412011 -99.173225
17 5956dbd495a72203b050926e3 Churreria El Moro Coffee Shop Álvaro Obregón 86 06100 19.411109 -99.168823
18 578e5a5c498e57a5d7d4412a F/i Farmacia Internacional Café Álvaro Obregón 86 06010 19.428560 -99.152531
19 5932c6d84b45b1b0812e1fa2 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 45f6995bf5b8714b13e9630 Cucurucho Café Álvaro Obregón 86 06500 19.423255 -99.167027
22 5892bae9498ef72f398f23e Forte Bread & Coffee Coffee Shop Álvaro Obregón 86 06400 19.414875 -99.159986
23 55c8d76b498e7e9a80857277 Brown Caffeine Lab Café Álvaro Obregón 86 06760 19.406822 -99.159828
24 5c37a6b5135b39002c5d831 Tierra Garat Coffee Shop Álvaro Obregón 86 11560 19.434279 -99.187837
25 56a527986498eadf1c14252b Fortunata Café Coffee Shop Álvaro Obregón 86 04020 19.346784 -99.160447
26 5971649dbab134905e85d1 7 Café Barra De Especialidad Café Álvaro Obregón 86 03020 19.390827 -99.155640
27 59e2d93e0d8a0b671eb0bf10 Krispy Kream Liverpool Delta Donuts Álvaro Obregón 86 03000 19.403544 -99.155079
28 52ad4dc5711d2503adf390e2 CUCURUCHO Coffee Shop Álvaro Obregón 86 06700 19.412620 -99.161390
29 551c2b6f498e1cf926b8be0e Cielito Querido Café Café Álvaro Obregón 86 07300 19.488877 -99.127995
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 445148f26a4b50625e79403d3 Chiquitto Coffee Shop Álvaro Obregón 86 06100 19.406895 -99.173017
33 586e0ee15e56b41e0a303c69 Cleotilde Coffee Shop Álvaro Obregón 86 11800 19.402134 -99.171606
34 5a0e1d028194cf76a74db3a5 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 58f419e351950e5959f0648e7 Cielito Querido Café Coffee Shop Álvaro Obregón 86 07760 19.484001 -99.132998
37 596f855a59f5c3ad76e4112 Punta Del Cielo Alta Extraccion Coffee Shop Álvaro Obregón 86 03100 19.437549 -99.191732
38 5895310e0b56550436282bf Té Cuento Tea Room Álvaro Obregón 86 11504 19.377883 -99.171250
39 4e07a879b0fba5ee1db693 Café Avellaneda Café Álvaro Obregón 86 04020 19.348300 -99.160814
40 5aaa867bb5461808488ccb40 Latente Café Café Álvaro Obregón 86 03230 19.367725 -99.177624
```

```
#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

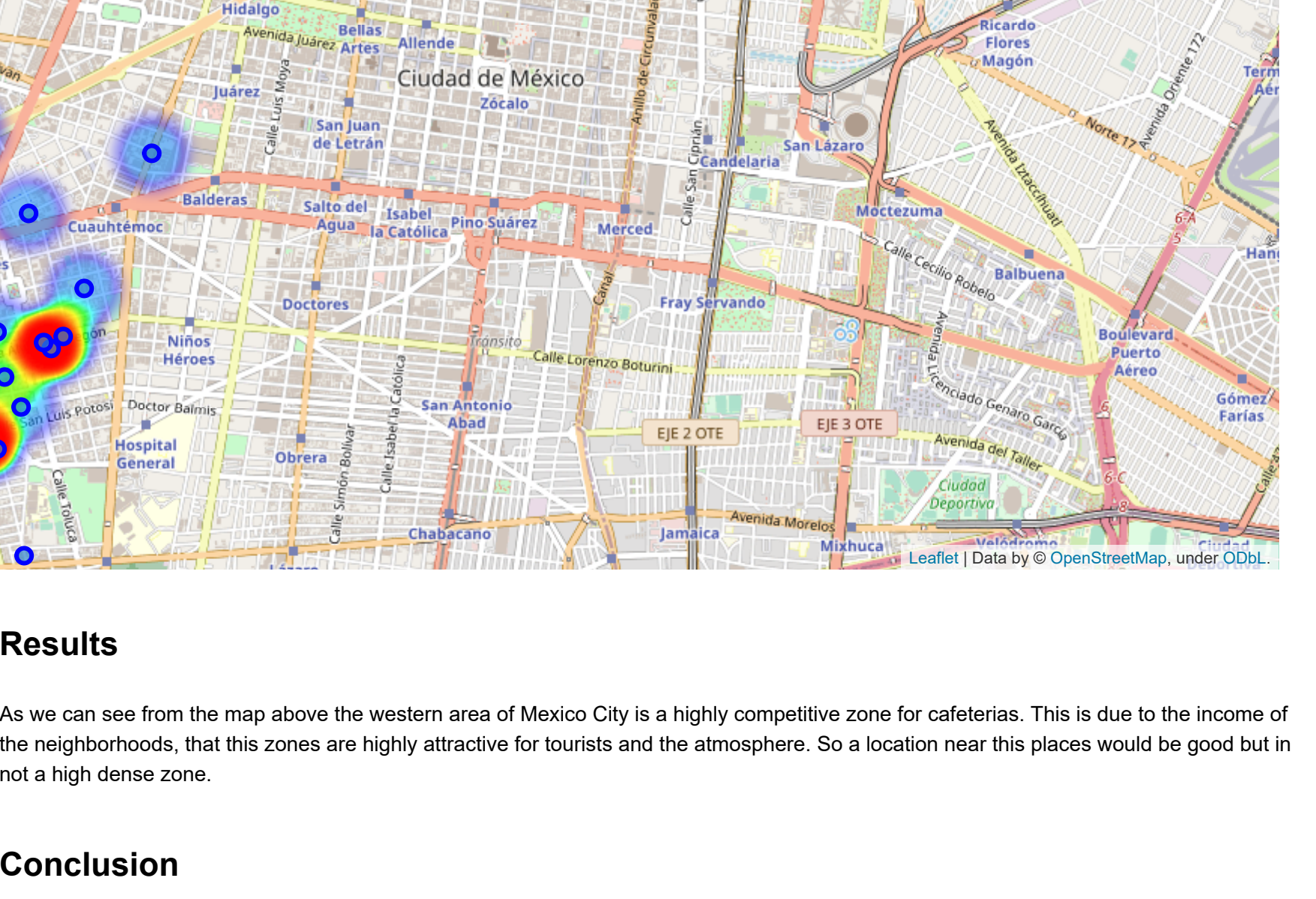
#map
map_mexico = folium.Map(location=[city_center["lat"], city_center["lng"]], zoom_start=14)

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.

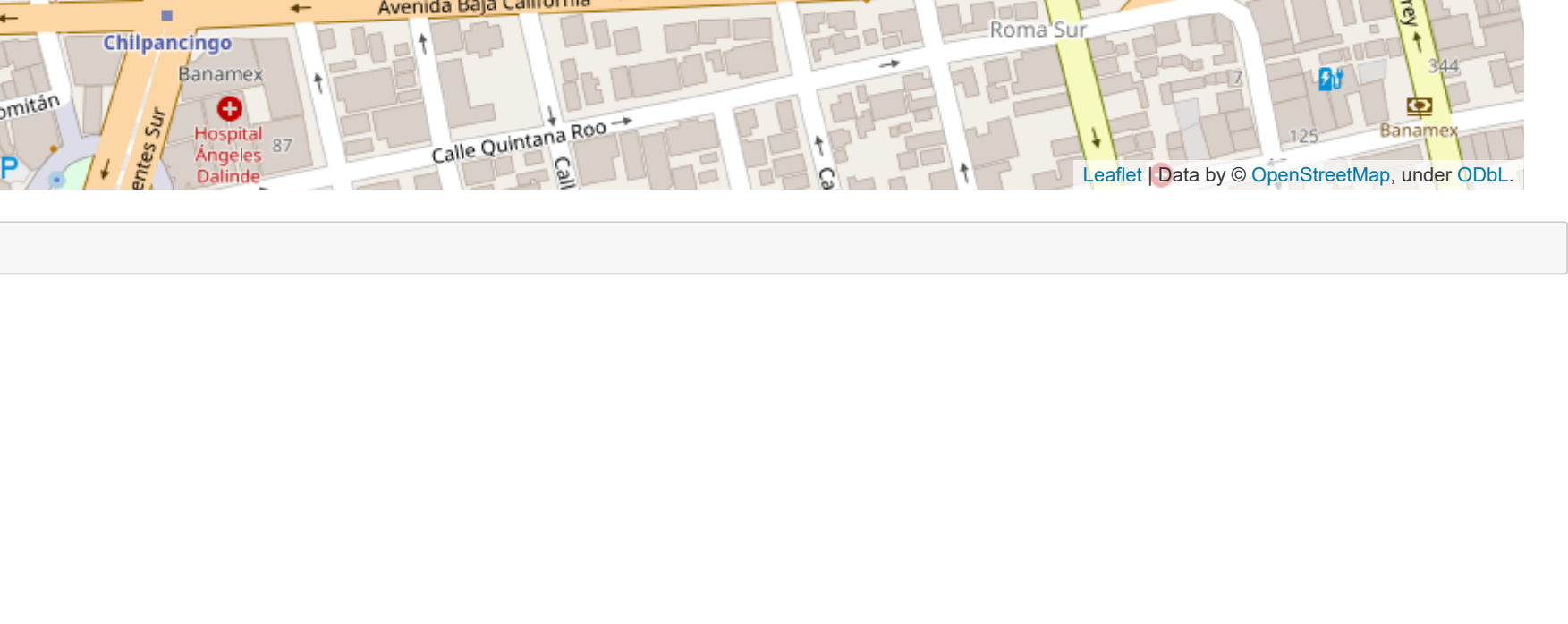
Conclusion

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 [ ]:
```