Battle of the Neighborhoods (Week 2)

Capstone Project Final Assignment

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1.0 Introduction

1.1 Assignment Background

For this assignment, let us assume that we are currently working as a data scientist for Central Park Hotel, New York. Our stakeholders would like us to find out how many malls are there located around the hotel's area.

1.2 Assignment Objective

The main objective is to find the total number of malls around the hotel and identify each one of them and provide important details such as tips, ratings, trending venues (if available) and pin-point each of their location.

2.0 Methodology

2.1 Data Acquisition & Sources

To acquire the necessary information to perform our research, we use Google to get the exact address of the hotel we are working in – Central Park Hotel New York. We also use Google to validate the result of our findings regarding the malls located near the hotel to ensure that they are correct.

2.2 Foursquare API & Python Results

This section will explain the use of Foursquare API to collect the necessary data we are looking for and using Python codes to execute and give us the result. We will show only some of the key codes used to extract data from Foursquare.

For the complete methodology on how we arrive to the result, please refer to this link:

[https://github.com/MelvinYeonata/Coursera_Capstone/blob/master/Final%20Assignment%20Capstone%20Project.ipynb]

2.3 Key Python Codes Used

In this section of the methodology we will showcase some of the important codes being used to get the desired results for our data scientist report.

```
# My Foursquare Client ID
CLIENT_ID = ''

# My Foursquare Client Secret
CLIENT_SECRET = ''

# Foursquare Version Tag
VERSION = '20180604'
LIMIT = 30
```

Fig 2.3.1, Summon Foursquare

The figure above shows the line of codes used to access Foursquare services so that we could collect geo-locations of our desired targets in the world map.

```
# Get address from Google
address = '870 7th Ave, New York, NY 10019, USA'

geolocator = Nominatim(user_agent="foursquare_agent")
location = geolocator.geocode(address)
latitude = location.latitude
longitude = location.longitude
print(latitude, longitude) # Show hotel's latitude and longitude coordinates
```

```
40.7646446 -73.9812106
```

Fig 2.3.2, Geo-locator codes

Figure 2.3.2 shows the line of codes we use to show the hotel we are currently working in. Note that we found the address not by using Foursquare but use Google search instead. Remember, we need the coordinates in order to pin-point the exact location of our hotel in the world map.

```
search_query = 'Mall'
radius = 1000
```

Fig 2.3.3, Search Query

Once we have established our hotel's location, Fig 2.3.3 displays the search query where we ask Foursquare to locate any malls within 1 kilometer radius. It is typed as '1000' because Foursquare recognizes distance in meters by default.

```
venues_map = folium.Map(location=[latitude, longitude], zoom_start=13) # Generate map centred around th
e hotel

# Add a red circle marker to represent the Park Central Hotel New York
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 malls as blue circle markers
for lat, lng, label in zip(dataframe_filtered.lat, dataframe_filtered.lng, dataframe_filtered.categorie
s):
    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
```

Fig 2.3.4, Visualize location into a map

Figure 2.3.4 shows the codes used to locate the exact locations of our hotel and the malls within 1 kilometer radius of the hotel.

3.0 Results

This section shows the results we have found after going through the python codes and employing Foursquare API services.

	name	categories	address	cc	city	country
0	Central Park Mall	Park	Central Park	US	New York	United States
1	TurnStyle Underground Market	Food Court	1000 S 8th Ave	US	New York	United States
2	Broadway Pedestrian Mall - 59th St to 53rd St	Other Great Outdoors	Broadway	US	New York	United States
3	Rockefeller Plaza Mall	Shopping Plaza	45 Rockefeller Plz	US	New York	United States
4	Jewel Mall	Jewelry Store	76 W 47th St	US	New York	United States
5	TGI Fridays	American Restaurant	761 7th Ave	US	New York	United States
6	LUSH	Cosmetics Shop	1000 South Eighth Avenue, Suite #20	US	New York	United States
7	Literary Walk	Sculpture Garden	The Mall	US	New York	United States

Fig 3.1, Table from Pandas Dataframe

Figure 3.1 shows the tabular format of the Pandas dataframe. It shows all the hotels within 1 kilometer away from Central Park Hotel, New York. We can see in the table that there are a total of 8 malls around the vicinity sorted from the nearest to the furthest from the hotel – Central Park Mall being the nearest and Literary Walk being the furthest.

The categories in the table show what each malls are most likely representing based on their shops or points-of-interests. For example, Central Park Mall has the category of “Park” because it is near to the Central Park and people value the place for its view. Jewel Mall has the category of “Jewelry Store” because the mall showcases numerous jewelry stores which recommend people to shop in Jewel Mall for their jewelry needs or wants.

Fig 3.2, New York Map with Geo-locator Positions

The figure above shows a map of New York City with the red dot showing the exact location of Central Park Hotel and the blue dots representing the malls within 1 kilometer radius of the hotel.

	text	agreeCount	disagreeCount	id	user.firstName	user.lastName	user.gender	user.id
0	Another highly photographed part of Central Park, with beautiful trees lining the pathway. At the Southern end you'll find the LITERARY WALK, with statues of several literary figures	3	0	5b0a9a189ba3e5002c434257	May		female	2787312

Fig 3.3, Tips from user about a mall

Figure 3.3 shows the tips from users that have commented about a mall – in this case it is the Central Park Mall. We only receive one tip because we are using the Foursquare Sandbox Account otherwise we could obtain more results.

4.0 Discussion

Based on our findings, we have found that there are only a total of 8 malls within the 1 kilometer radius of Central Park Hotel New York. The data also tells us that each of the malls offer a unique variety of shops and proves that the hotel is indeed located in a strategic place for tourists who likes to go shopping. We could now provide recommendations to customers on where they are most likely to enjoy their time shopping based on their individual desires.

5.0 Recommendations

The recommendation may vary depending on the customer's desire where they would want to shop nearby the hotel. We could also offer them shop categories listed previously on the tabular format and we can query their request directly to the Foursquare API for a more refined search.

In order to get a more detailed result, we also recommend upgrading the Foursquare account to gain more access to its services in retrieving venue information around the hotel. The limitation of using the Sandbox Account and Developer Account proved to be crippling for our report.

6.0 Conclusion

In conclusion, we can combine the use of Python and Foursquare API to locate venues of interest. Hotel owners are now able to search for malls based on their customer's shopping needs.