OPENING A GREEK RESTAURANT IN NEW YORK:

AN EXPLORATORY ANALYSIS

A report submitted as the Capstone project for IBM Data Science

course

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1. INTRODUCTION AND PROBLEM STATEMENT

As one of the most densely populated cities in the world, New York is a prime example of heavy competition when it comes to food joints and options. The food and restaurant business is a challenging yet rewarding aspect of living in New York, which stands to be a good opportunity to open a specific restaurant that will serve delicacies from a different country.

More specifically, this report will provide an exploratory analysis of New York, in order to open a Greek restaurant in an area which is not served, nor it has a Greek restaurant in the vicinity. In other words, this report will utilize the knowledge gathered throughout this course in order to map all of the Greek restaurants in New York, upon which an investment analysis can be made in the future.

2. DATA DEFINITION

In order to execute the goal of this report, the analysis presented hereinafter will adopt the Foursquare API information of the Greek restaurants in New York city. More specifically, the data will be gathered in the same fashion as the shown in the course, starting from the same location. However, in order to visualize the data, a different type of restaurant will be chosen. The starting location will remain the same as in the lectures. After visualizing the Greek restaurants in New York, an investment decision can be made.

3. METHODOLOGY

The following pages outline the code used in order to achieve the aim of this report. More specifically, the code is divided in two parts, in order to:
  ➢ Determine the current Greek restaurants in New York in a radius of 200 meters around the Conrad Hotel and
  ➢ Determine a popular spot for possible new investment

The first part of the code is related with the first part of the methodology, while the second part of the code with the second part of the methodology.

```python
import requests
import pandas as pd
import numpy as np
import random

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 # plotting library

print('Folium installed')
print('Libraries imported.')
```

```python
filtered_columns = ['name', 'categories'] + [col for col in dataframe.columns if col.startswith('location.')] + ['id']
dataframe_filtered = dataframe.loc[:, filtered_columns]

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']

dataframe_filtered['categories'] = dataframe_filtered.apply(get_category_type, axis=1)

dataframe_filtered.columns = [column.split('.')[-1] for column in dataframe_filtered.columns]

dataframe_filtered
```

```python
venues_map = folium.Map(location=[latitude, longitude], zoom_start=13)

folium.CircleMarker(
    [latitude, longitude],
    radius=10,
    color='red',
    popup='Conrad Hotel',
    fill = True,
    fill_color = 'red',
    fill_opacity = 0.6
).add_to(venues_map)

for lat, lng, label in zip(dataframe_filtered.lat, dataframe_filtered.lng, dataframe_filtered.categories):
    folium.CircleMarker(
        [lat, lng],
        radius=5,
        color='blue',
        popup=label,
        fill = True,
        fill_color='blue',
        fill_opacity=0.6
    ).add_to(venues_map)

venues_map
```

```
dataframe = json_normalize(items)

filtered_columns = ['venue.name', 'venue.categories'] + [col for col in dataframe.columns if col.startswith('venue.location.')]
dataframe_filtered = dataframe.loc[:, filtered_columns]

dataframe_filtered['venue.categories'] = dataframe_filtered.apply(get_category_type, axis=1)

dataframe_filtered.columns = [col.split('.')[-1] for col in dataframe_filtered.columns]

dataframe_filtered.head(10)
```

```python
venues_map = folium.Map(location=[latitude, longitude], zoom_start=13)

folium.CircleMarker(
    [latitude, longitude],
    radius=200,
    popup='Hotel',
    fill=True,
    color='red',
    fill_color='red',
    fill_opacity=0.6
    ).add_to(venues_map)

for lat, lng, label in zip(dataframe_filtered.lat, dataframe_filtered.lng, dataframe_filtered.categories):
    folium.CircleMarker(
        [lat, lng],
        radius=5,
        popup=label,
        fill=True,
        color='blue',
        fill_color='blue',
        fill_opacity=0.6
        ).add_to(venues_map)

venues_map
```

4. RESULTS

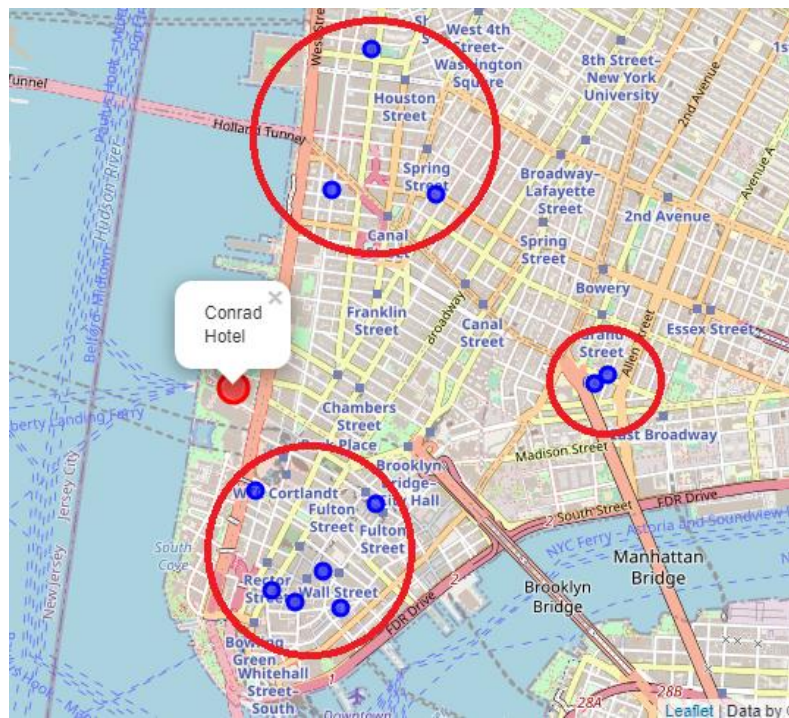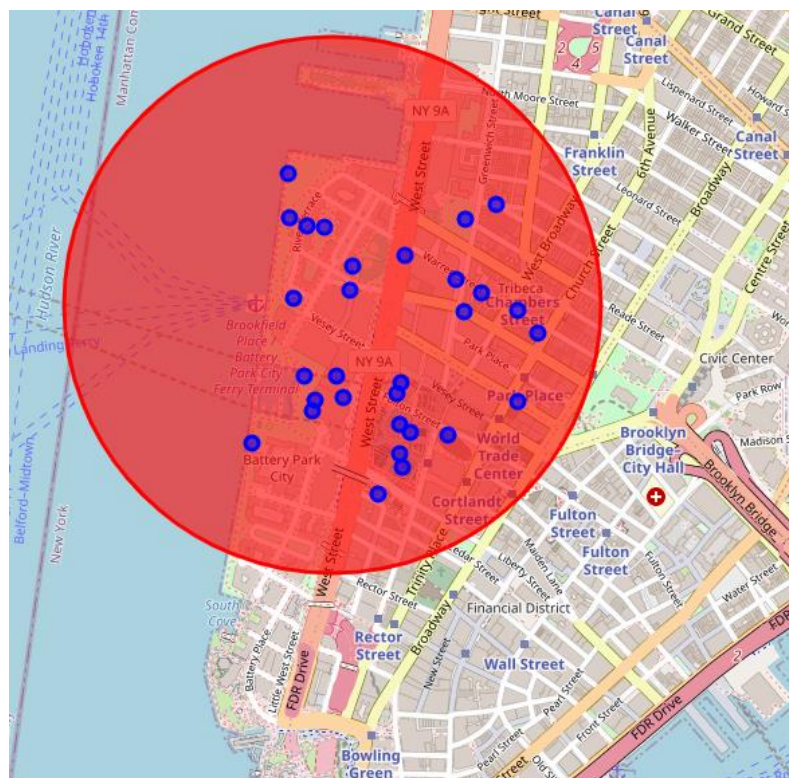## Figure 1 – Three Clusters of Greek Restaurants

Figure 2 – Popular Places

The methodology adopted above, and the figures generated show that there are exactly 11 Greek restaurants in the 2000 meters vicinity of Conrad Hotel. Moreover, these restaurants/joints are clustered in three clusters, leaving a significant hole in the middle that can be exploited. The results also show that there are many popular places around the intended location for investment, making the step a logical one.

5. DISCUSSION

The methodology adopted above aimed at determining how many greek restaurants are present in the vicinity of the Conrad Hotel. Moreover, with a clustering analysis, the results show that there are three clusters of greek restaurants in the 2000 meters radius of the hotel. Moreover, there are 11 Greek restaurants however, the results presented above show that an investment is likely plausible and will be a logical step in order to fill in the blank space in the analysed region. Since there are also many popular spaces in the vicinity, the Greek restaurant will surely be a success, either prior or post going out.

6. CONCLUSION

The purpose of this report was to create an exploratory analysis report in order to determine whether an investment in a Greek restaurant will be a successful decision. Considering the results and the discussion, it is more than clear that such an investment will be profitable or very likely to succeed, since it fills a significant hole between three clusters of Greek restaurants, in a heavily popular and populated area of New York.