# Opening a Restaurant in New York

IBM DATA SCIENCE CAPSTONE PROJECT

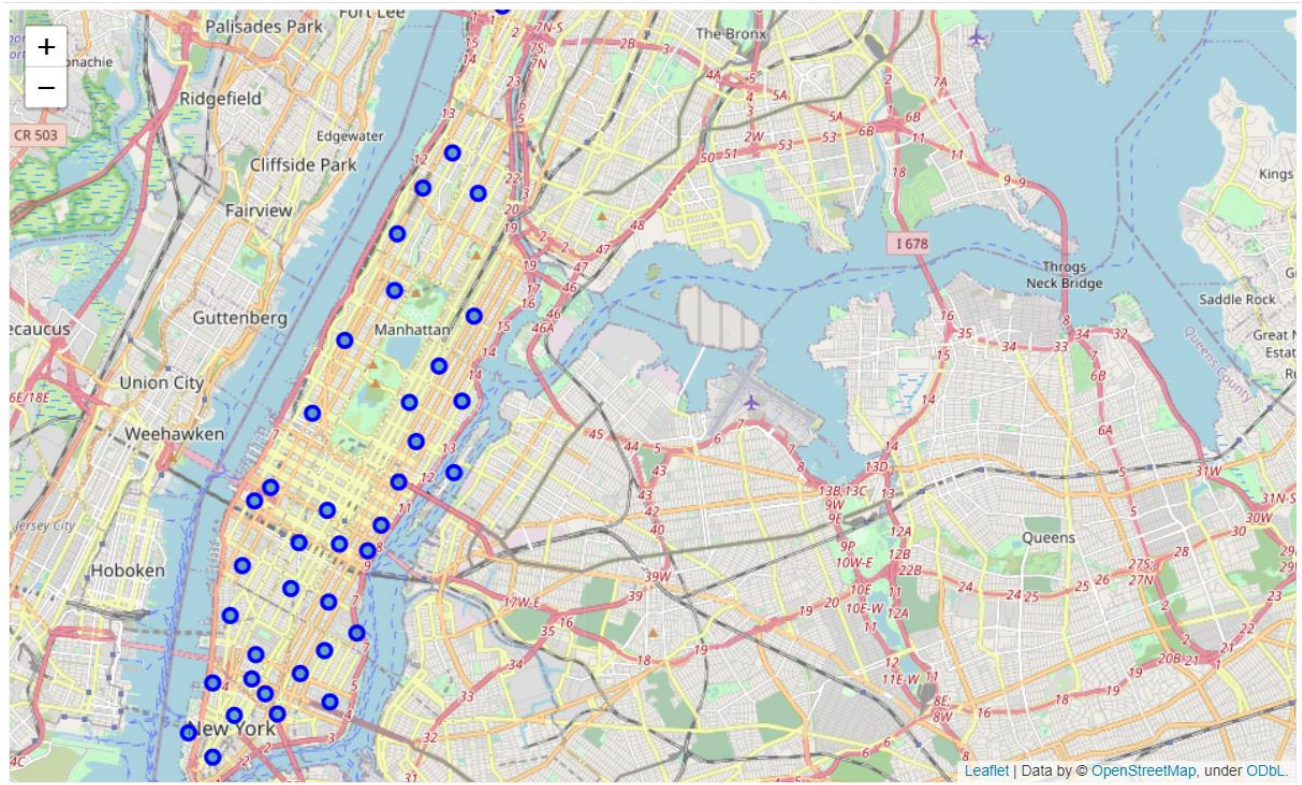
# INTRODUCTION

As we know New York is one of the well developed city in the UNITED STATES OF AMERICA, and also New York is well populated and developed city, so competition is bit high. So in that city if anyone opens a restaurant, can he sustain in that competetion or else where can someone opens his restaurant which helps someone to get higher profits. So from my analysis i would to like to give a brief to someone who wanted to open a restaurant in New York City about all the positives and negatives (ie. all the insights) of opening that restaurant at that particular place.

# DATASET AND ITS PRE-PROCESSING

This Dataset is taken from internet from which it contains the New York City Boroughs and from geocodes library we found the latitudes & longitudes of those boroughs and we are going to analysis only Manhattan Borough, so all the remaning were removed and the neighborhoods of Manhattan were found using Four Square API.

# Representation of Neighbourhoods in Manhattan using Folium Maps



# Nearyby Venues in one of the Neighbourhood

```
----Battery Park City----
            venue  freq
0            Park  0.11
1             Gym  0.08
2           Hotel  0.08
3  Memorial Site  0.06
4   Gourmet Shop  0.04


----Carnegie Hill----
                 venue  freq
0          Coffee Shop  0.09
1                 Café  0.05
2  Italian Restaurant  0.03
3                 Bar  0.03
4           Wine Shop  0.03
```

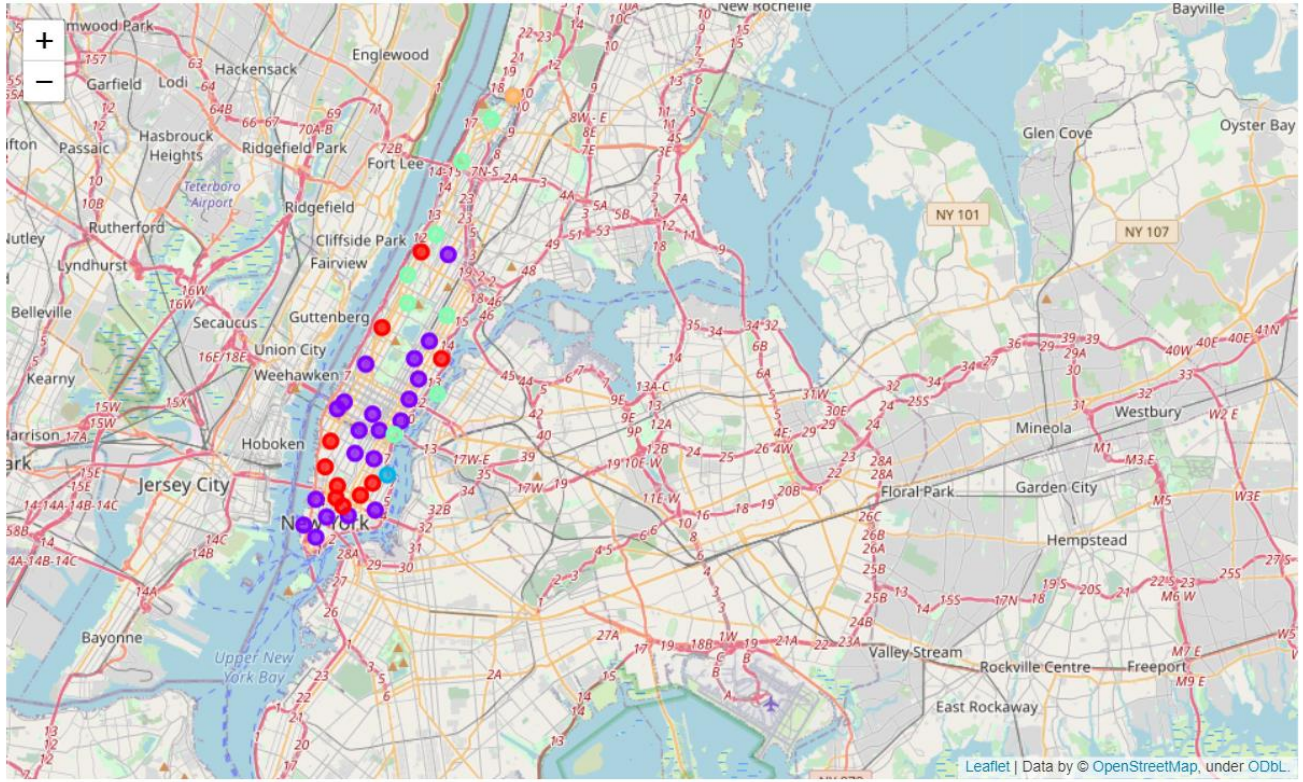
# Nearyby venues after converting them into tabular form

| | Neighborhood | 1st Most Common Venue | 2nd Most Common Venue | 3rd Most Common Venue | 4th Most Common Venue | 5th Most Common Venue | 6th Most Common Venue | 7th Most Common Venue | 8th Most Common Venue | 9th Most Common Venue | 10th Most Common Venue |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | Battery Park City | Park | Gym | Hotel | Memorial Site | Wine Shop | Gourmet Shop | Boat or Ferry | Burger Joint | Food Court | Shopping Mall |
| 1 | Carnegie Hill | Coffee Shop | Café | Yoga Studio | Pizza Place | Bar | Bookstore | Gym | Gym / Fitness Center | Japanese Restaurant | Italian Restaurant |
| 2 | Central Harlem | Bar | Gym / Fitness Center | Chinese Restaurant | African Restaurant | American Restaurant | Seafood Restaurant | French Restaurant | Library | Gym | Beer Bar |
| 3 | Chelsea | Art Gallery | Coffee Shop | Italian Restaurant | Seafood Restaurant | Ice Cream Shop | Market | Café | Bakery | Clothing Store | Bookstore |
| 4 | Chinatown | Cocktail Bar | Chinese Restaurant | Bakery | Bar | Optical Shop | Coffee Shop | Spa | Salon / Barbershop | American Restaurant | Boutique |

# Applying Clustering Algorithm to the Dataset

| | Borough | Neighborhood | Latitude | Longitude | Cluster Labels | 1st Most Common Venue | 2nd Most Common Venue | 3rd Most Common Venue | 4th Most Common Venue | 5th Most Common Venue | 6th Most Common Venue | 7th Most Common Venue | 8th Most Common Venue | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **0** | Manhattan | Marble Hill | 40.876551 | -73.910660 | 4 | Sandwich Place | American Restaurant | Gym | Coffee Shop | Yoga Studio | Donut Shop | Tennis Stadium | Supplement Shop | S |
| **1** | Manhattan | Chinatown | 40.715618 | -73.994279 | 1 | Cocktail Bar | Chinese Restaurant | Bakery | Bar | Optical Shop | Coffee Shop | Spa | Salon / Barbershop | F |
| **2** | Manhattan | Washington Heights | 40.851903 | -73.936900 | 3 | Café | Bakery | Deli / Bodega | Mobile Phone Shop | Chinese Restaurant | Grocery Store | Donut Shop | Tapas Restaurant | F |
| **3** | Manhattan | Inwood | 40.867684 | -73.921210 | 3 | Mexican Restaurant | Bakery | Café | Pizza Place | Lounge | Restaurant | Park | Chinese Restaurant | |
| **4** | Manhattan | Hamilton Heights | 40.823604 | -73.949688 | 3 | Pizza Place | Coffee Shop | Café | Mexican Restaurant | Deli / Bodega | Cocktail Bar | Indian Restaurant | Sushi Restaurant | |

# Visualizing one cluster



# Conclusion & Decsisions Made

From the above Methods, I can conclude that opening a restaurant at these places Stuyvesant Town Roosevelt Island Midtown South Battery Park City Lincoln Square Central Harlem West Village would lead the user to the higher profits than opening in the places which are not mentioned in the results section.