Battle of Neighbourhoods Presentation

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Introduction

- Finding an optimum business location for opening a new restaurant in New York.

- Business Problems :

  a. Choice of first neighbourhood to start business

  b. Easy to replicate

  c. Low competition

  d. High demand

  e. Choice of menu

- Success Criteria : Best neighbourhood which meets the above criteria.

New York city- Business Environment

- Market is highly competitive.

- Highly developed city so cost of doing business is also one of the highest.

- New business venture or expansion needs to be analysed carefully.

- One should strategically targeting the market in order to

  a. Reduce the risk

  b. Return on investment should be reasonable.

New York City - Cuisine

The City of New York is famous for its excellent cuisine. It's food culture includes an array of international cuisines influenced by the city's immigrant history.

- Central and Eastern European immigrants, especially Jewish immigrants - bagels, cheesecake, hot dogs, knishes, and delicatessens.

- Italian immigrants - New York-style pizza and Italian cuisine

- Jewish immigrants and Irish immigrants - pastrami and corned beef

- Chinese and other Asian restaurants, sandwich joints, trattorias, diners, and coffeehouses are ubiquitous throughout the city

- Mobile food vendors - Some 4,000 licensed by the city.

- Middle Eastern foods such as falafel and kebabs examples of modern New York street food.

- Famous for fine dining Michelin starred restaurants. The city is home to "nearly one thousand of the finest and most diverse haute cuisine restaurants in the world", according to Michelin.

So it is evident that to survive in such competitive market it is very important to strategically plan.

Factors to analyse to determine the location of Restaurant

- New York Population
- New York City Demographics
- Are there any Farmers Markets, Wholesale markets etc nearby so that the ingredients can be purchased fresh to maintain quality and cost?
- Are there any venues like Gyms, Entertainmnet zones, Parks etc nearby where floating population is high etc
- Who are the competitors in that location?
- Cuisine served / Menu of the competitors
- Segmentation of the Borough
- Untapped markets
- Saturated markets etc

Data Description

Data 1 : New York city will be analysed in this project.We will be using the below datasets for analysing New York city.

Neighbourhoods has a total of 5 boroughs and 306 neighbourhoods. In order to segment the neighbourhoods and explore them, we will essentially need a dataset that contains the 5 boroughs and the neighbourhoods that exist in each borough as well as the the latitude and longitude coordinates of each neighbourhoods.

This dataset exists for free on the web.
Link to the dataset is : https://geo.nyu.edu/catalog/nyu_2451_34572

	Neighborhood	Neighborhood Latitude	Neighborhood Longitude
0	Wakefield	40.894705	-73.847201
1	Wakefield	40.894705	-73.847201
2	Wakefield	40.894705	-73.847201
3	Wakefield	40.894705	-73.847201
4	Wakefield	40.894705	-73.847201

Data 2 : Second data which will be used is the DOHMH Farmers Markets and Food Boxes dataset. In this we will be using the data of Farmers Markets.
https://data.cityofnewyork.us/dataset/DOHMH-Farmers-Markets-and-Food-Boxes/8vwk-6iz2

Website- https://www.grownyc.org/greenmarketco/foodbox
GrowNYC's Fresh Food Box Program is a food access initiative that enables under-served communities to purchase fresh, healthy, and primarily regionally grown produce well below traditional retail prices.

	FacilityName	Service Category	Service Type	Address	Address 2	Borough	ZipCode	Latitude	Longitude	AdditionalInfo	StartDate	EndDate	Monday	Tuesday
0	Inwood Park Greenmarket	Farmers Markets and Food Boxes	Farmers Markets	Isham St bet Seaman & Cooper	NaN	Manhattan	10034	40.869009	-73.920320	Open year-round	NaN	NaN	NaN	NaN
1	82nd Street Greenmarket	Farmers Markets and Food Boxes	Farmers Markets	82nd St bet 1st & York Aves	NaN	Manhattan	10028	40.773448	-73.948954	Open year-round	NaN	NaN	NaN	NaN
2	1 Centre Street	Farmers Markets and Food Boxes	Food Boxes	1 Centre Street	South Building, 9th Floor	Manhattan	11101	40.713028	-74.003753	Open year-round	NaN	NaN	NaN	NaN
3	125th Street Farmers Market	Farmers Markets and Food Boxes	Farmers Markets	125th St & Adam Clayton Powell Jr Blvd	NaN	Manhattan	10027	40.808981	-73.948327	Market open dates: 6/13/2017 to 11/21/2017	06/13/2017	11/21/2017	NaN	10am-7pm
4	170 Farm Stand	Farmers Markets and Food Boxes	Farmers Markets	170th St & Townsend Ave	NaN	Bronx	10452	40.840095	-73.916827	Market open dates: 7/5/2017 to 11/22/2017	07/05/2017	11/22/2017	NaN	NaN

Data 3 :

Data from wikipedia pages below :

1.New York Population
2.New York City Demographics
3.Cuisine of New York city

https://en.wikipedia.org/wiki/New_York_City
https://en.wikipedia.org/wiki/Economy_of_New_York_City
https://en.wikipedia.org/wiki/Portal:New_York_City
https://en.wikipedia.org/wiki/Cuisine_of_New_York_City
https://en.wikipedia.org/wiki/List_of_Michelin_starred_restaurants_in_New_York_City

- **Data 4**: Data from FourSquare.com

New York city geographical coordinates data will be utilised as input for the Foursquare API, that will be leveraged to provision venues information for each neighbourhood.We will use the Foursquare API to explore neighbourhoods in New York City. The below is image of the Foursquare API data.

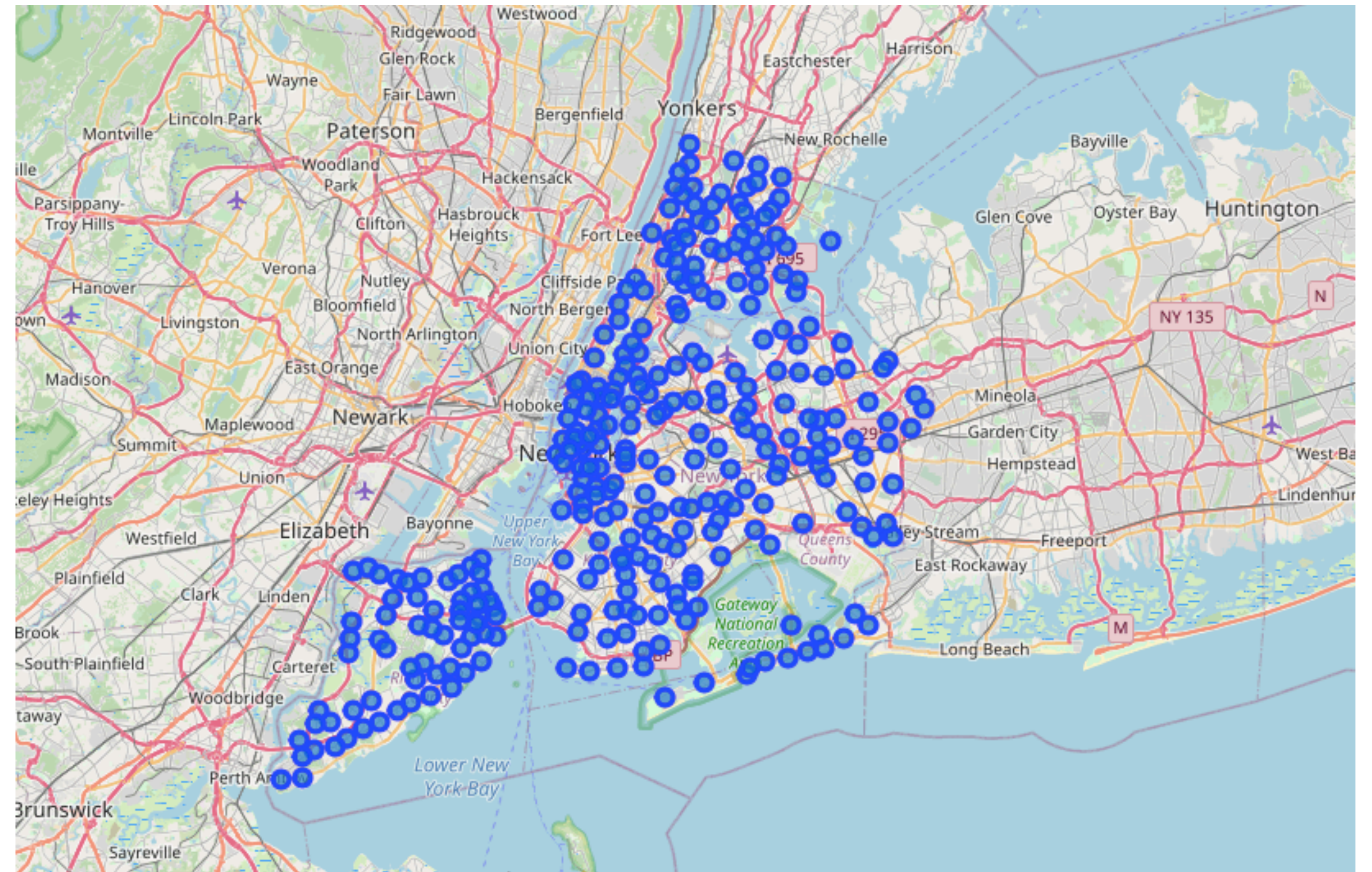|	Neighborhood	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
0	Wakefield	40.894705	-73.847201	Lollipops Gelato	40.894123	-73.845892	Dessert Shop
1	Wakefield	40.894705	-73.847201	Rite Aid	40.896521	-73.844680	Pharmacy
2	Wakefield	40.894705	-73.847201	Cooler Runnings Jamaican Restaurant Inc	40.898283	-73.850478	Caribbean Restaurant
3	Wakefield	40.894705	-73.847201	Carvel Ice Cream	40.890487	-73.848568	Ice Cream Shop
4	Wakefield	40.894705	-73.847201	Dunkin Donuts	40.890631	-73.849027	Donut Shop

Analytical Approach

- New York city neighbourhood has a total of 5 boroughs and 306 neighbourhoods.

- PART 1 - Clustering of Manhattan and Brooklyn.

- PART 2 - Clustering of Bronx, Queens and Staten Island.

- Only restaurant data is filtered from foursquare.com venues data and utilised for this project.

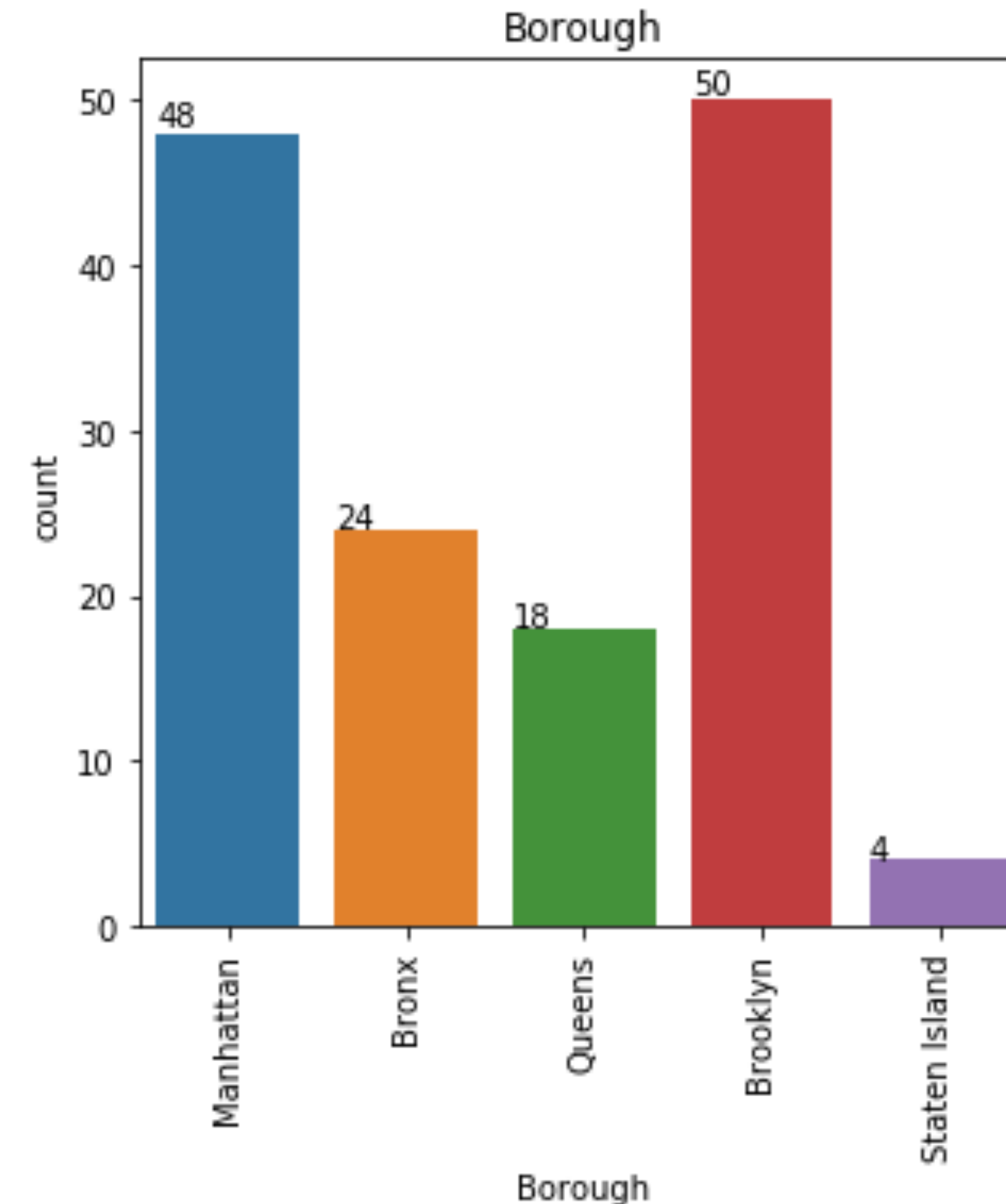# Data 1: NY city geographical coordinates Data

- Load the data and explore data - newyork_data.json

- Transform the data of nested python dictionaries into a pandas data frame.

- Data frame contains the geographical coordinates of New York city neighbourhoods.

- Data will used to get Venues data from Foursquare.

- Geopy and folium libraries used to create a map of New York city with neighbourhoods superimposed on top.

- Github file link : https://github.com/Vigneshsdas/Restaurant-Project/blob/main/%20BON%20Week%202%20P1.ipynb

Data 2 : DOHMH Farmers Markets and Food Boxes dataset.

- In this we will be using the data of Farmers Markets.

- There are totally 144 Farmers Markets in New York city.

- Highest number are in Manhattan and Brooklyn.And lowest in Queens, Bronx and Staten Island.

- Github file link : https://github.com/Vigneshsdas/Restaurant-Project/blob/main/BON%20Week2%20P4.ipynb

Data 3: NY City data

- Data 3 : To analyize New York city Population, Demographics and Cuisine , scrapped the data from Wikipedia pages given above in the data section.

- We used BeautifulSoup python library.

- Beautiful Soup is a Python package for parsing HTML and XML documents (including having malformed markup, i.e. non-closed tags, so named after tag soup).

- It creates a parse tree for parsed pages that can be used to extract data from HTML, which is useful for web scraping.

- Github file link : https://github.com/Vigneshsdas/Restaurant-Project/blob/main/BON%20Week2%20P2.ipynb

Data 3.1: New York City Population

- Manhattan (New York County) is the geographically smallest and most densely populated borough.

- Manhattan's (New York County's) population density of 72,033 people per square mile (27,812/km2) in 2015 makes it the highest of any county in the United States and higher than the density of any individual American city.

- Brooklyn (Kings County), on the western tip of Long Island, is the city's most populous borough.

- Queens (Queens County), on Long Island north and east of Brooklyn, is geographically the largest borough.

	Borough	County	Estimate_2017	square_miles	square_km	persons_sq_mi
0	Manhattan	New York	1,664,727	22.83	59.13	72,033
1	The Bronx	Bronx	1,471,160	42.10	109.04	34,653
2	Brooklyn	Kings	2,648,771	70.82	183.42	37,137
3	Queens	Queens	2,358,582	108.53	281.09	21,460
4	Staten Island	Richmond	479,458	58.37	151.18	8,112
5	City of New York		8,622,698	302.64	783.83	28,188	10,947
6	State of New York		19,849,399	47,214	122,284	416.4	159

Data 3.2: New York City Demographics

- New York City is the most populous city in the United States , with an estimated record high of 8,622,698 residents as of 2017,incorporating more immigration into the city than outmigration since the 2010 United States Census.

- The racial composition is as given below. This is the reason New York city has restaurants serving cuisine from many countries such as India, Africa, Japan etc. This also increases the scope for restaurants business in New York City.

	Racialcomposition	2010	1990	1970	1940
0	White	44.0%	52.3%	76.6%	93.6%
1	—Non-Hispanic	33.3%	43.2%	62.9%	92.0%
2	Black or African American	25.5%	28.7%	21.1%	6.1%
3	Hispanic or Latino (of any race)	28.6%	24.4%	16.2%	1.6%
4	Asian	12.7%	7.0%	1.2%	–

Data 3.3: Cuisines in New York city

- This data has been manually prepared. Data is taken from Wikipedia page - https://en.wikipedia.org/wiki/Cuisine_of_New_York_City

- Data used to create word cloud.

- Github file link : https://github.com/Vigneshsdas/Restaurant-Project/blob/main/BON%20Week2%20P3.ipynb

- New York City Cuisine : Most Preferred Food in New York City –Italian, Puerto Rican, Mexican, Jewish, Indian, Pakistani & Dominican.


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<matplotlib.figure.Figure at 0x7f562c289160>
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Most Preferred Food in New York City -

1. Italian
2. Purto Rican
3. Mexican
4. Jewish
5. Indian
6. Pakistani
7. Dominican

- Brooklyn Cuisine : Most Preferred Food in Brooklyn is – Italian, Puerto Rican & Mexican.
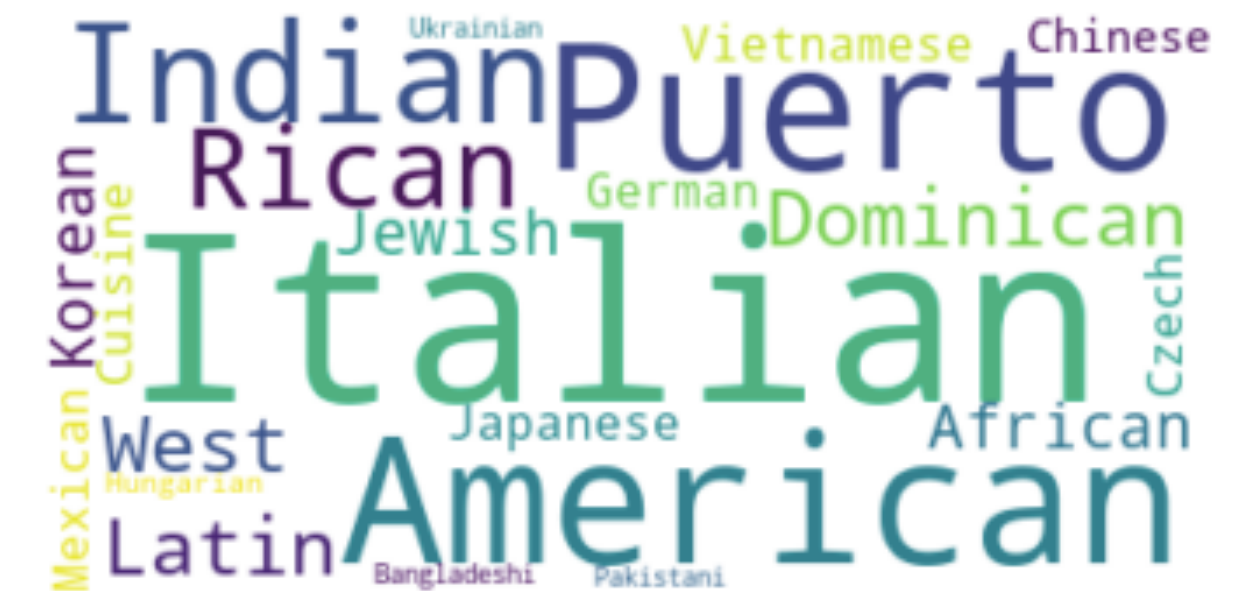

<matplotlib.figure.Figure at 0x7f562c149b00>

Most Preferred Food in Brooklyn is -

1. Italian
2. Purto Rican
3. Mexican

- Manhattan Cuisine : Most Preferred Food in Manhattan is – Italian, American, Puerto Rican and Indian.

<matplotlib.figure.Figure at 0x7f562c178d68>

Most Preferred Food in Manhattan is -

1. Italian
2. American
3. Puerto Rican
4. Indian

- Queen's Cuisine : Most Preferred Food in Queens is – Indian, Irish, Pakistani and Mexican.

<matplotlib.figure.Figure at 0x7f562c122160>

Most Preferred Food in Queens is -

1. Indian
2. Irish
3. Pakistani
4. Mexican

- Bronx Cuisine : Most Preferred Food in The Bronx is – Italian, Puerto Rican, Albanian and Dominican.

<matplotlib.figure.Figure at 0x7f562c126978>

Most Preferred Food in The Bronx is -

1. Italian
2. Puerto Rican
3. Albanian
4. Dominican

Data 4 : **FourSquare.com**

- NewYork city geographical coordinates data has be utilized as input for the Foursquare API, that has been leveraged to provision venues information for each neighbourhood.

- We used the Foursquare API data to explore neighborhoods in New York City.

- Using the geographical coordinates of each neighbourhood foursquare API calls are made to get top 200 venues in a radius of 1000 meters.

PART – 1 Brooklyn and Manhattan
PART – 2 Bronx, Queens and Staten Island

Part 1- Brooklyn and Manhattan

- Venue Data

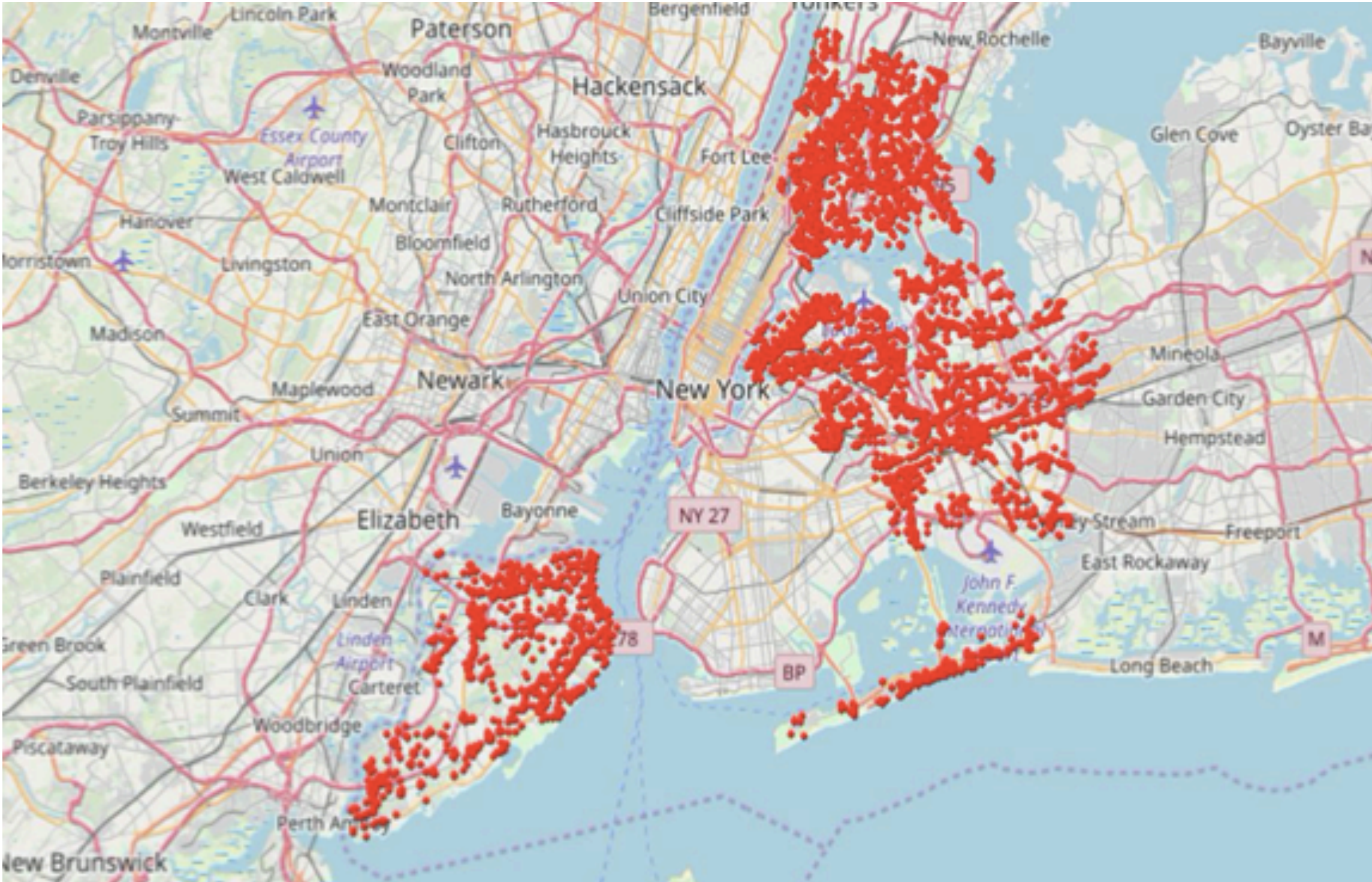|	Neighborhood	NeighborhoodLatitude	NeighborhoodLongitude	Venue	VenueLatitude	VenueLongitude	VenueCategory
0	Marble Hill	40.876551	-73.91066	Arturo's	40.874412	-73.910271	Pizza Place
1	Marble Hill	40.876551	-73.91066	Bikram Yoga	40.876844	-73.906204	Yoga Studio
2	Marble Hill	40.876551	-73.91066	Tibbett Diner	40.880404	-73.908937	Diner
3	Marble Hill	40.876551	-73.91066	Sam's Pizza	40.879435	-73.905859	Pizza Place
4	Marble Hill	40.876551	-73.91066	Loeser's Delicatessen	40.879242	-73.905471	Sandwich Place

- Visualisation: Generated the below Brooklyn and Manhattan Venues Visualisation. The "BM_venues" data frame has 9708 venues and 397 unique venue types.

PART – 2 Bronx, Queens and Staten Island

- Venue's Data

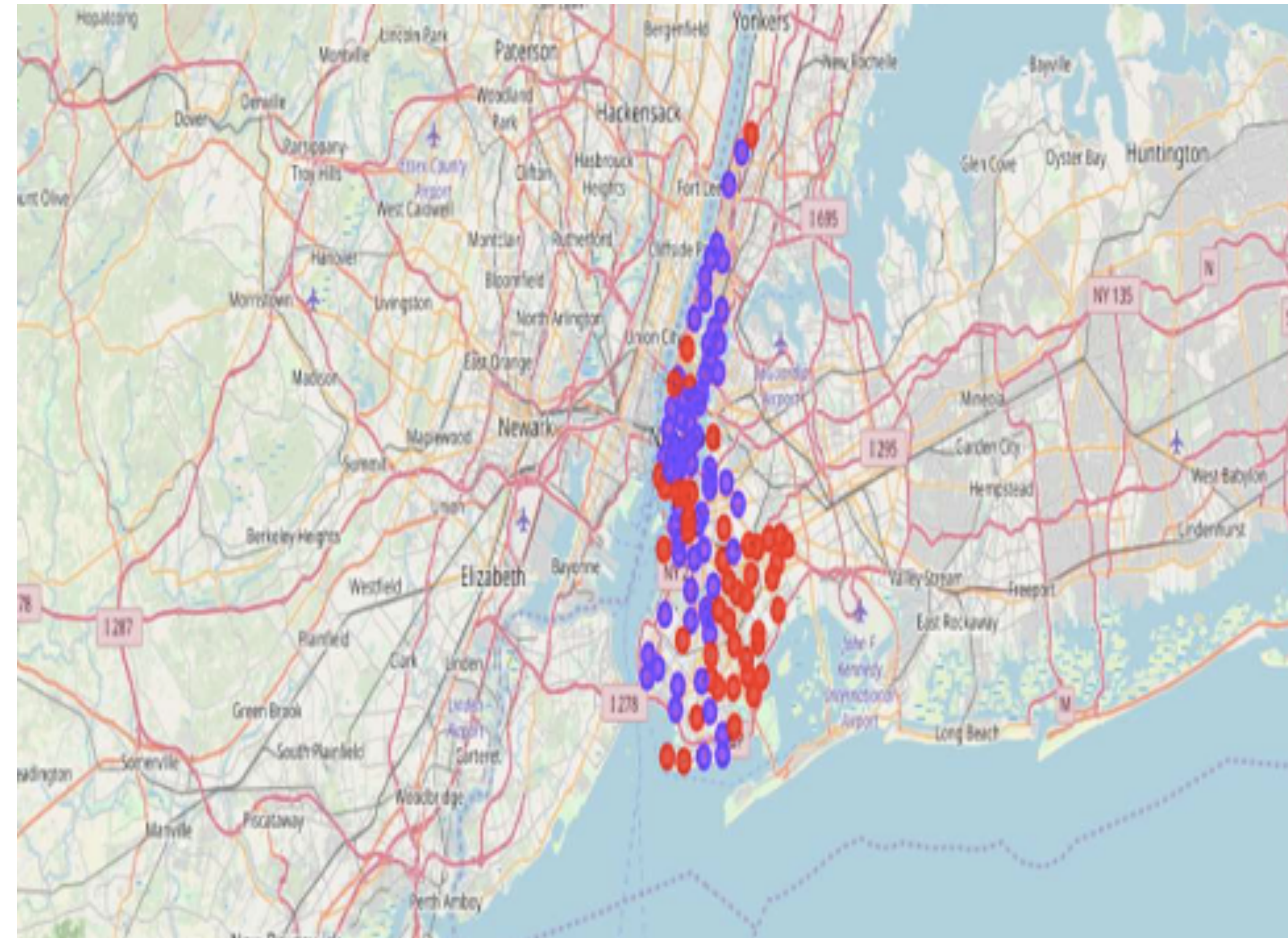|	Neighborhood	NeighborhoodLatitude	NeighborhoodLongitude	Venue	VenueLatitude	VenueLongitude	VenueCategory
0	Wakefield	40.894705	-73.847201	Lollipops Gelato	40.894123	-73.845892	Dessert Shop
1	Wakefield	40.894705	-73.847201	Ripe Kitchen & Bar	40.898152	-73.838875	Caribbean Restaurant
2	Wakefield	40.894705	-73.847201	Jackie's West Indian Bakery	40.889283	-73.843310	Caribbean Restaurant
3	Wakefield	40.894705	-73.847201	Ali's Roti Shop	40.894036	-73.856935	Caribbean Restaurant
4	Wakefield	40.894705	-73.847201	Rite Aid	40.896521	-73.844680	Pharmacy

- Visualisation: The Bronx, Queens and Staten Island Venues - "BQS_venues" data frame has 10805 venues and 387 unique venue types.

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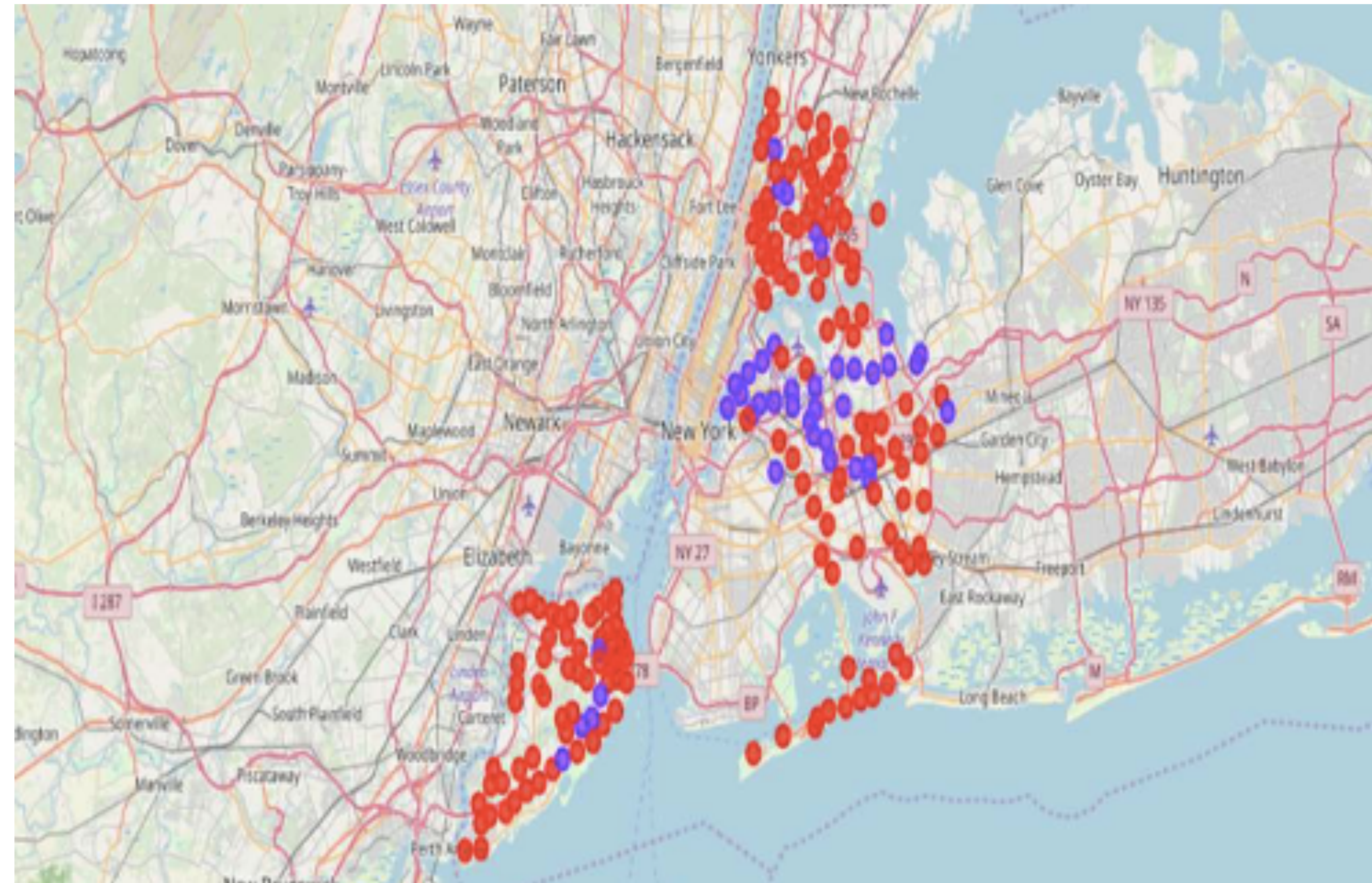# Results
Part 1- Brooklyn and Manhattan

- Segmenting and clustering neighbourhoods.

- Cluster0 : The Total and Total Sum of cluster0 has smallest value. It shows that the market is not saturated.

- Cluster1 : The Total and Total Sum is very high. Lot of competition. Saturated neighbourhoods.

PART – 2 Bronx, Queens and Staten Island

- Cluster0 : The Total and Total Sum of cluster0 has smallest value. It shows that the market is not saturated.There are untapped markets.

- Cluster1 : The Total and Total Sum is very high. Lot of competition. Saturated neighbourhoods.

Discussion

- Scope to explore cuisines of various countries in Bronx, Queens and Staten Island.

- In Manhattan and Brooklyn restaurants , cuisines of many countries are part of their Menu. Risk can be taken with great menu on board. It also shows people love and explore cuisines of various countries.

- Scope to increase Farmers markets in Bronx, Queens and Staten Island.

- Region - Cluster0

- Neighbourhood – Staten Island –
  Tod Hill, Port Ivory, Bloomfield

Conclusion

- Analysis performed on limited data.

- Re-run program with updated information.

- Brooklyn and Manhattan has high concentration of restaurant business. Very competitive market.

- Bronx, Queens and Staten Island also has good number of restaurants but not as many as required. So this can be explored.

- As per the neighbourhood or restaurant type mentioned like Indian Restaurant, analysis can be checked. A venue with lowest risk and competition can be identified.