



# THE BATTLE OF THE NEIGHBORHOODS

Finding an optimum location to open a restaurant in  
New York City

# Introduction

- To find an optimum location to open restaurant
- Business Problem:
  - a. Choice of first neighbourhood to open a restaurant
  - 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- Facts

- Most populous city in the USA
- Diverse and financial capital, multicultural
- Provides business opportunities
- Business friendly environment
- Global hub for business and commerce



# 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 their market in order to
  - a. This will help in the reduction of risk
  - b. The return on investment will be reasonable

# Cuisine in New York City

NYC 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, cheesecakes, hot dogs, knishes
- Italian immigrants- New York style pizza and Italian cuisine
- Jewish and Irish- pastrami and corned beef
- Chinese and other Asian restaurants- sandwich joints, diners and coffee houses
- Mobile food vendors- some 4000 licenced by the city
- Middle Eastern food like falafel and kebabs
- Famous for fine dining Michelin star restaurants. The city is home to nearly 1000 of the finest and most diverse haute cuisine restaurants in the world, according to Michelin
- So it is evident that to survive in such a competitive market it is very important to strategically plan

# Factors affecting the location of a restaurant

- Population
- Demographics
- If there are any Farmers Markets, Wholesale markets, etc. nearby so that the ingredients can be purchased fresh to maintain quality and cost
- Competition in the same locality
- Cuisine of the competitors
- Segmentation of the boroughs
- Untapped and saturated markets
- Venues like gyms, parks, etc. where the floating population is high

# Data Description- 1

- Geographical data: NYC has a total of 5 boroughs and 306 neighborhoods. To segment and explore the neighborhoods, a dataset is needed that contains all 5 boroughs and neighborhoods that exist in each borough as well as the coordinates of each neighborhood
- Link: [https://geo.nyu.edu/catalog/nyu\\_2451\\_34572](https://geo.nyu.edu/catalog/nyu_2451_34572)

	<b>Borough</b>	<b>Neighborhood</b>	<b>Latitude</b>	<b>Longitude</b>
<b>0</b>	Bronx	Wakefield	40.894705	-73.847201
<b>1</b>	Bronx	Co-op City	40.874294	-73.829939
<b>2</b>	Bronx	Eastchester	40.887556	-73.827806
<b>3</b>	Bronx	Fieldston	40.895437	-73.905643
<b>4</b>	Bronx	Riverdale	40.890834	-73.912585



# Data Description- 2

- Data from Wikipedia as follows:

- a. Population data
- b. Demographics data
- c. Cuisine data

[https://en.Wikipedia.org/wiki/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/Economy_of_New_York_City)

[https://en.Wikipedia.org/wiki/Portal: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/Cuisine_of_New_York_City)

	<b>Racial Composition</b>	<b>2010</b>	<b>1990</b>	<b>1970</b>	<b>1940</b>
<b>0</b>	White	44.00%	52.30%	76.60%	93.60%
<b>1</b>	Non-Hispanic	33.30%	43.20%	62.90%	92%
<b>2</b>	Black or African American	25.50%	28.70%	21.10%	6.10%
<b>3</b>	Hispanic or Latino	28.60%	24.40%	16.20%	1.60%
<b>4</b>	Asian	12.70%	7.00%	1.20%	--



# Data Description- 3

- Farmers Market data:

<https://data.cityofnewyork.us/dataset/DOHMH-Farmers-Markets-and-Food-Boxes/8vwk-6iz2>

- A farmer's market is a public site used by two or more local or regional producers for the direct sale of farm products to consumers. In addition to fresh fruits and vegetables, markets may sell dairy products, fish, meat, baked goods, and other minimally processed foods.

	Borough	Market Name	Street Address	Latitude	Longitude	Days of Operation	Hours of Operations	Season Dates	Accepts EBT	Open Year-Round	Stellar Cooking Demonstrations	Food Activities for Kids	Location Point
0	Brooklyn	Urban Oasis Farmers' Market	681 Clarkson Ave.	40.656255	-73.936608	Wednesday	2pm-5:30pm	06/24/20-11/04/20	No	No	NaN	NaN	(40.656255, -73.936608)
1	Staten Island	Goodhue Center Go!Healthy Farm Stand	301 Prospect Ave	40.638983	-74.097422	Tuesday	11am-2pm	07/06/20-11/20/20	Yes	No	NaN	NaN	(40.638983, -74.097422)
2	Manhattan	Morningside Park's Down to Earth Farmers' Market	W 110th St & Manhattan Ave	40.801155	-73.959647	Saturday	9am-4pm (winter closes at 3pm)	Year-Round	Yes	Yes	NaN	NaN	(40.801155, -73.959647)
3	Bronx	170 Farm Stand	E 170th St & Townsend Ave	40.839882	-73.916783	Wednesday	2:30pm-6:30pm	7/15/20-11/25/20	Yes	No	NaN	NaN	(40.839882, -73.916783)
4	Manhattan	Go!Healthy Farm Stand at Mirabal Sisters Campus	21 Jumel Pl.	40.839305	-73.936159	Friday	11am-2pm	07/07/2020-11/20/20	Yes	No	NaN	NaN	(40.839305, -73.936159)

# Data Description- 4

- Data using Foursquare API
- NYC geographical coordinates data will be utilized as input for the Foursquare API, that will be leveraged to provide venues information for each neighborhood. Foursquare API is used to explore neighborhoods in NYC.

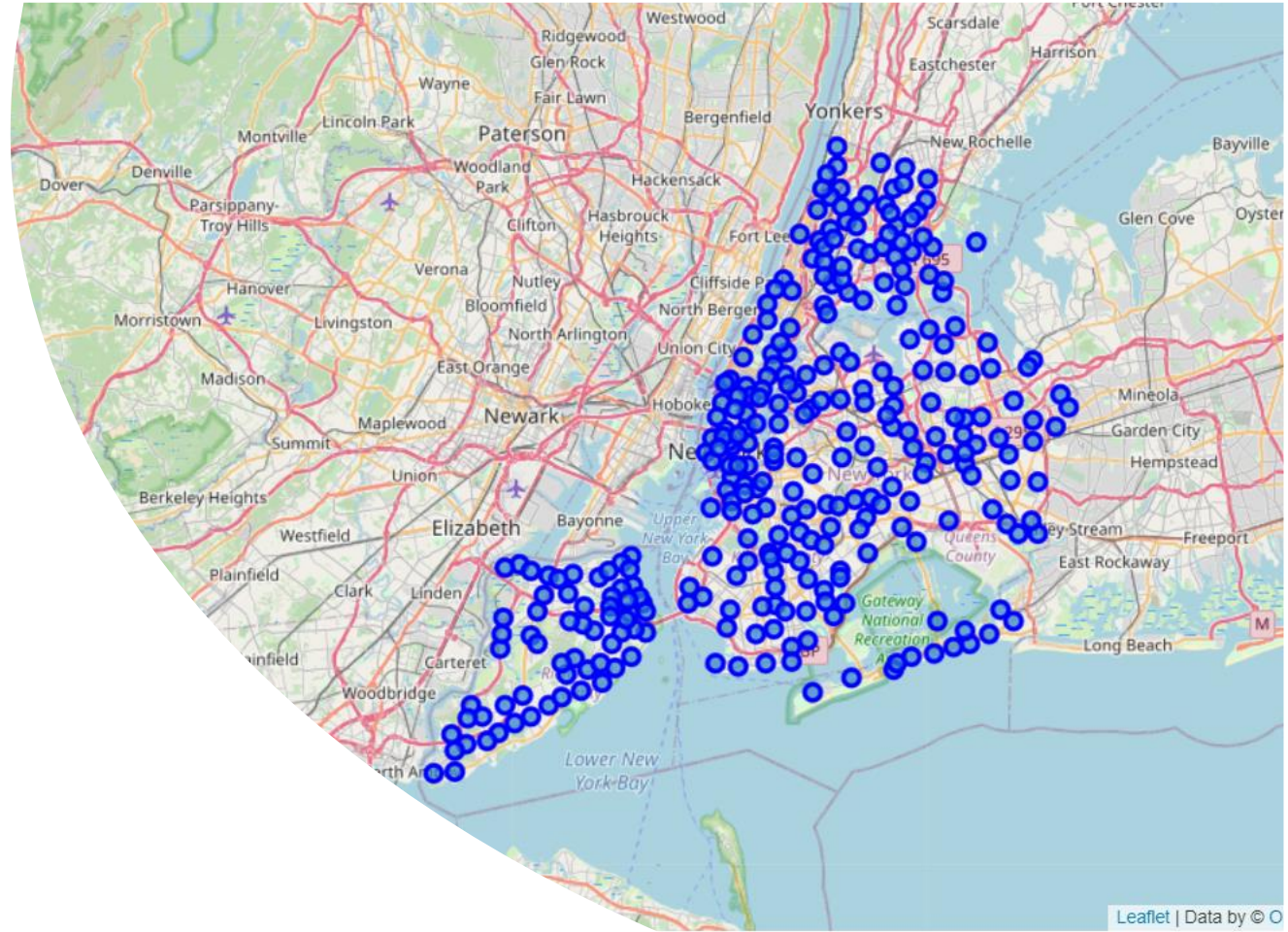
	Neighborhood	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
0	Marble Hill	40.876551	-73.91066	Bikram Yoga	40.876844	-73.906204	Yoga Studio
1	Marble Hill	40.876551	-73.91066	Arturo's	40.874412	-73.910271	Pizza Place
2	Marble Hill	40.876551	-73.91066	Tibbett 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	Starbucks	40.877531	-73.905582	Coffee Shop

# Approach

- NYC has 5 boroughs and 306 neighborhoods
- Part 1- Clustering Brooklyn and Manhattan
- Part 2- Clustering the Bronx, Staten Island and Queens
- From the Foursquare venues data, only the restaurant data is filtered and utilized

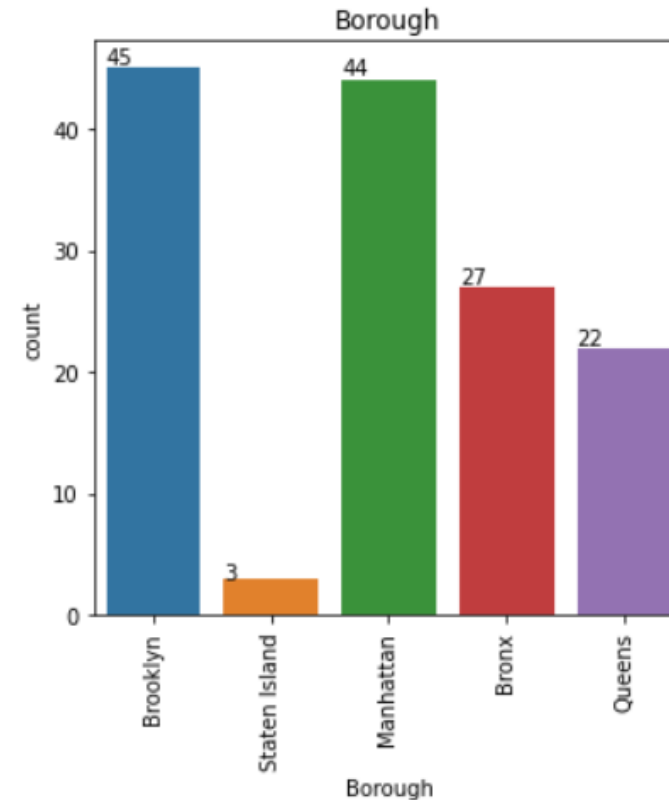
# Methodology 1

- NYC Geographical data
- Load and explore the data
- Transform the data into a pandas dataframe which contains geographical data of NYC neighborhoods
- This data will be used to get data from Foursquare
- Geopy and folium libraries to create map of NYC with neighborhoods superimposed on top



# Methodology 2

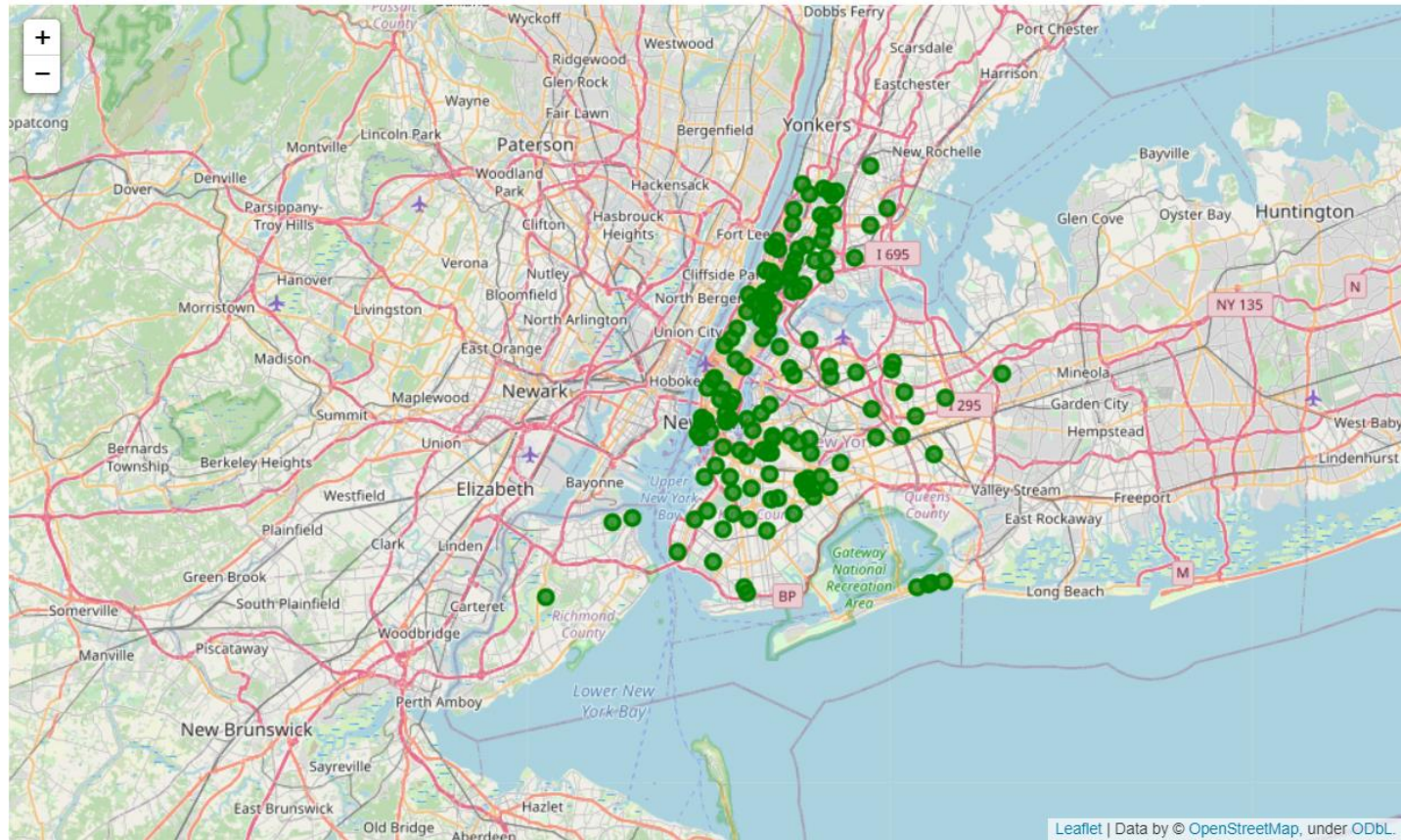
- DOHMH Farmers Market data
- Using data on farmers data
- Highest number of farmers markets are in Brooklyn and Manhattan
- There are a total of 141 farmers markets in NYC





# Methodology 2

## Visualising Farmer markets data



# Methodology 3

- To analyse NYC population, demographics and cuisine data scrapped from Wikipedia pages
- Using BeautifulSoup library in python
- BeautifulSoup is a python package for parsing HTML and XML documents
- It creates a parse tree for parsed pages that can be used to extract data from HTML, which is useful for web scraping



# Methodology 3- NYC Population

- Manhattan- smallest and most densely populated borough
- Brooklyn is the most populated borough
- Queens is the largest borough

	Borough	County	Estimate_2017	square_miles	square_km	persons_sq_mi
0	The Bronx	Bronx	1,418,207	30,100	42.10	109.04
1	Brooklyn	Kings	2,559,903	35,800	70.82	183.42
2	Manhattan	New York	1,628,706	368,500	22.83	59.13
3	Queens	Queens	2,253,858	41,400	108.53	281.09
4	Staten Island	Richmond	476,143	30,500	58.37	151.18
5		City of New York	8,336,817	842.343	302.64	783.83
6		State of New York	19,453,561	1,731.910	47,126.40	122,056.82

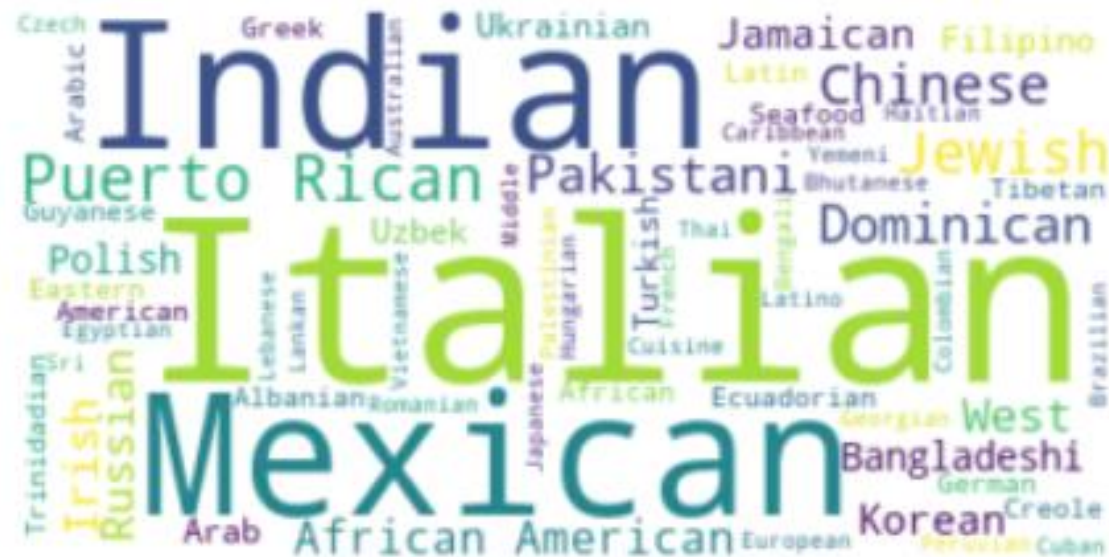
# Methodology 3- NYC Demographics

- NYC is the most populated city of the US, with an estimated record of high of 8,622,298 as of 2017. There is more immigration into the city than emigration
- The reason NYC has restaurants serving various cuisines from many countries is due to its racial composition. This also increases the scope for restaurant businesses in NYC

Racial Composition		2010	1990	1970	1940
0	White	44.00%	52.30%	76.60%	93.60%
1	Non-Hispanic	33.30%	43.20%	62.90%	92%
2	Black or African American	25.50%	28.70%	21.10%	6.10%
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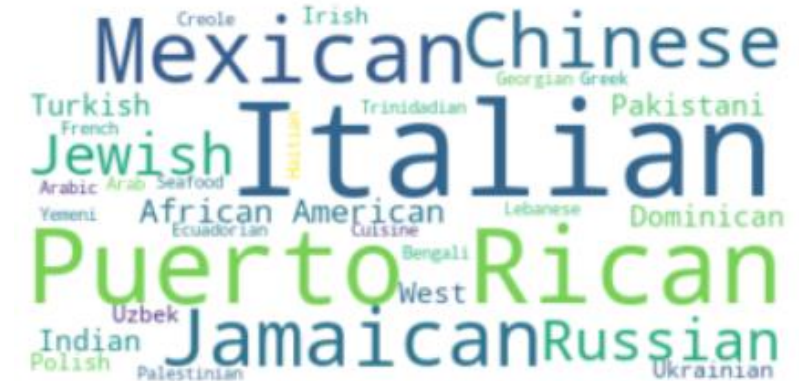
# Methodology 3- NYC Cuisine

- Data from the Wikipedia page for NYC cuisines was scraped and a word cloud was created
- Most preferred cuisine in NYC- Italian, Puerto Rican, Mexican, Jewish, Indian, Pakistani and Dominican



# Methodology 3- NYC Cuisine

- Brooklyn cuisine: most preferred is Italian, Puerto Rican, Mexican
- Manhattan cuisine: most preferred is Italian, Puerto Rican, Chinese, Indian



# Methodology 3- NYC Cuisine

- Queens cuisine: most preferred is Pakistani, Indian, Irish, Chinese, Korean
- The Bronx cuisine: most preferred is Italian, Puerto Rican, Dominican, Albanian



# Methodology 4

- The geographical coordinates of NYC must be utilized as input for the Foursquare API which is then leveraged to provide venue information for each neighborhood
- We used Foursquare API data to explore the neighborhoods of NYC
- Using the geographical coordinates of each neighborhood Foursquare API calls are made to get top 200 venues in a radius of 1000 meters.
- Part 1- Brooklyn and Manhattan
- Part 2- The Bronx, Queens and Staten Island

# Methodology 4

## Part 1- Brooklyn and Manhattan

- Venues data:

The generated data frame has 9627 venues and 403 unique venue types across 110 neighborhoods

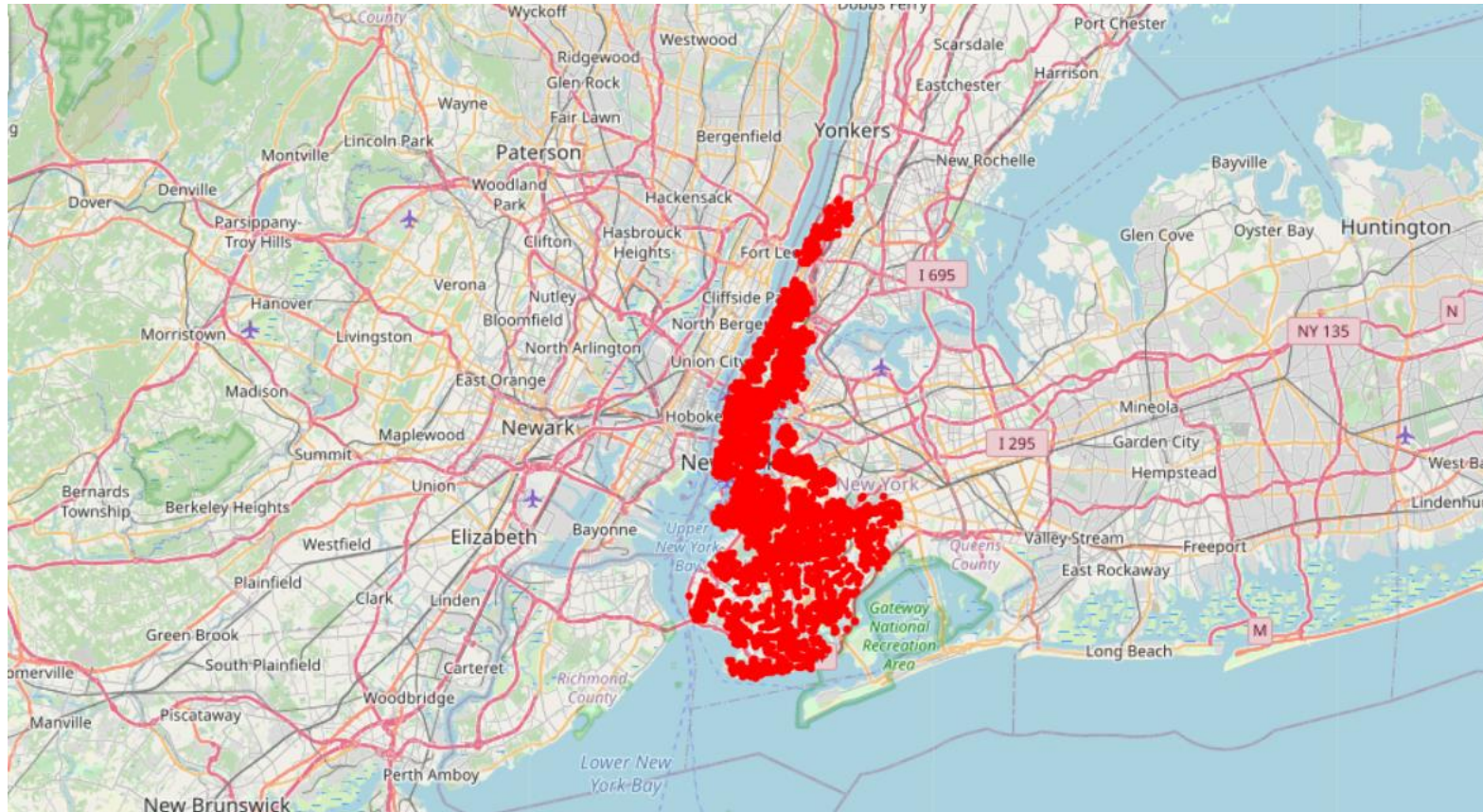
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# Methodology 4

## Part 1- Brooklyn and Manhattan

- Brooklyn and Manhattan- venues visualisation



# Methodology 4

## Part 2- The Bronx, Queens and Staten Island

- Venues data:

The generated data frame has 10826 venues and 389 unique venue types across 110 neighborhoods

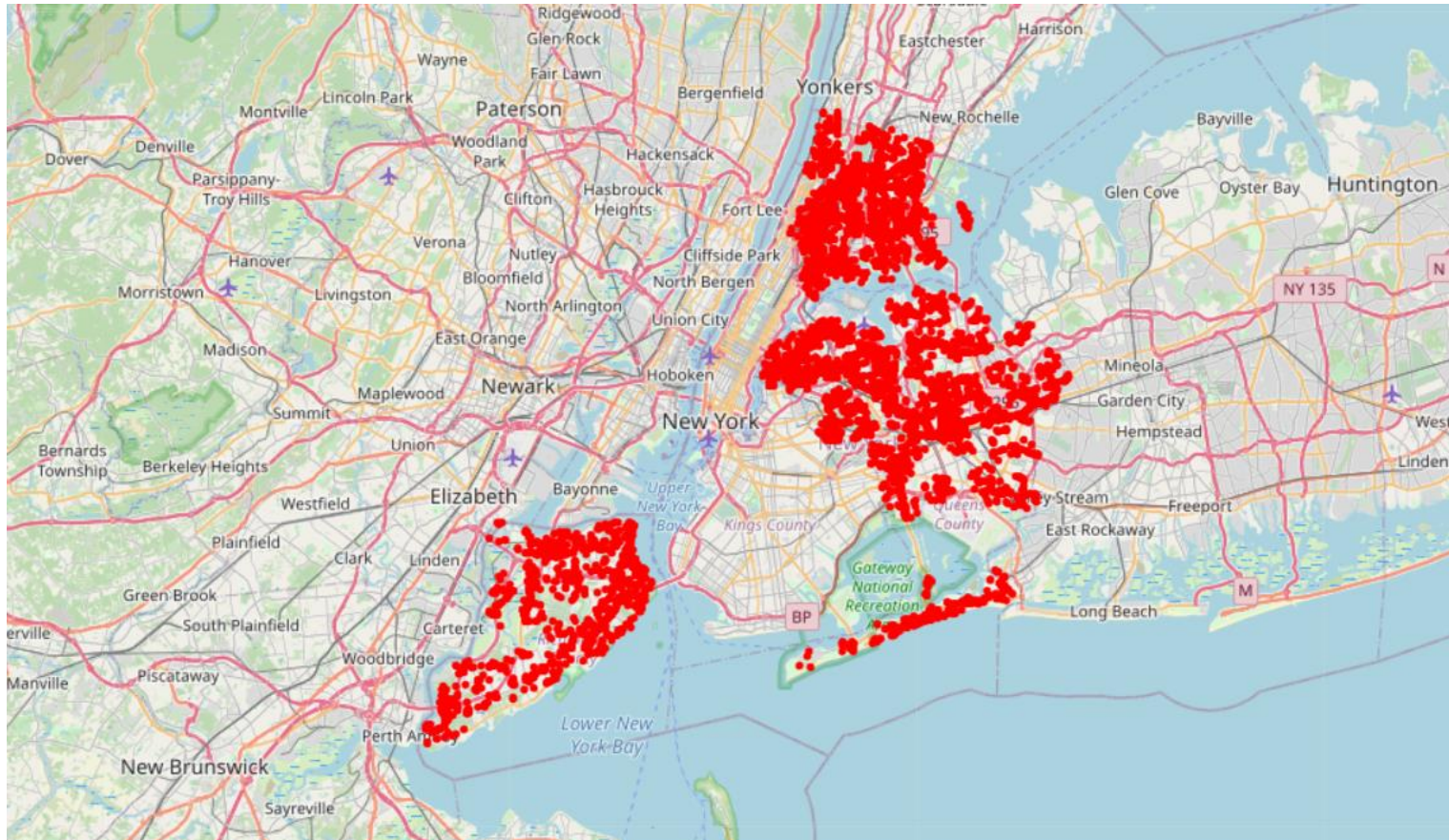
	Neighborhood	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
0	Wakefield	40.894705	-73.847201	Lollipops Gelato	40.894123	-73.845892	Dessert Shop
1	Wakefield	40.894705	-73.847201	Ripe Kitchen & Bar	40.898152	-73.838875	Caribbean Restaurant
2	Wakefield	40.894705	-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	40.896649	-73.844846	Pharmacy



# Methodology 4

## Part 2- The Bronx, Queens and Staten Island

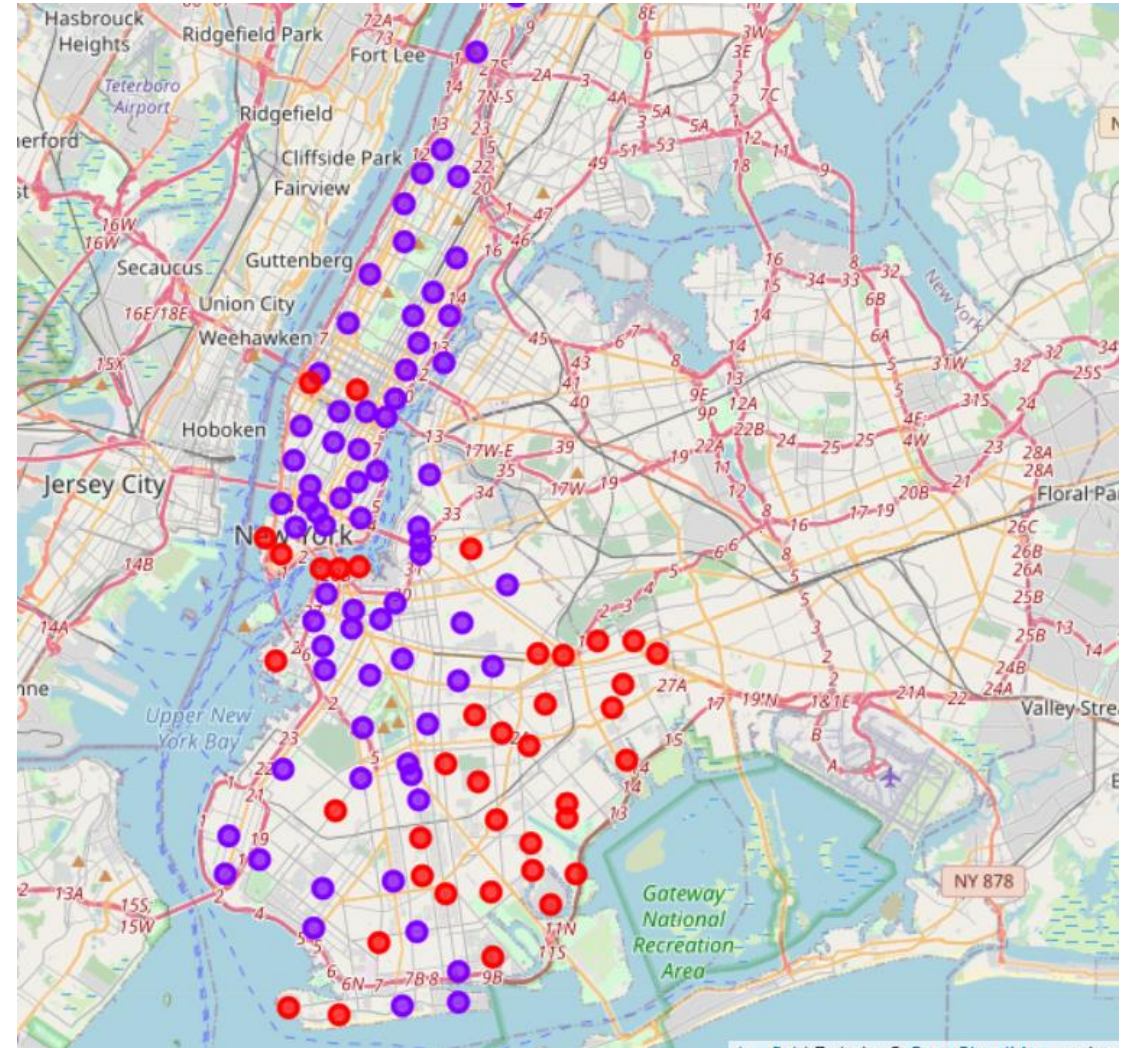
- The Bronx, Queens and Staten Island- venues visualization



# Output

## Part 1- Brooklyn and Manhattan

- Segmenting and clustering neighborhoods
- Cluster 0: the total and total sum has the smallest value. It shows that the market is not saturated.  
**Red** on map
- Cluster 1: total and total sum has a large value. It shows that the market is saturated and that there is a lot of competition.  
**Purple** on map

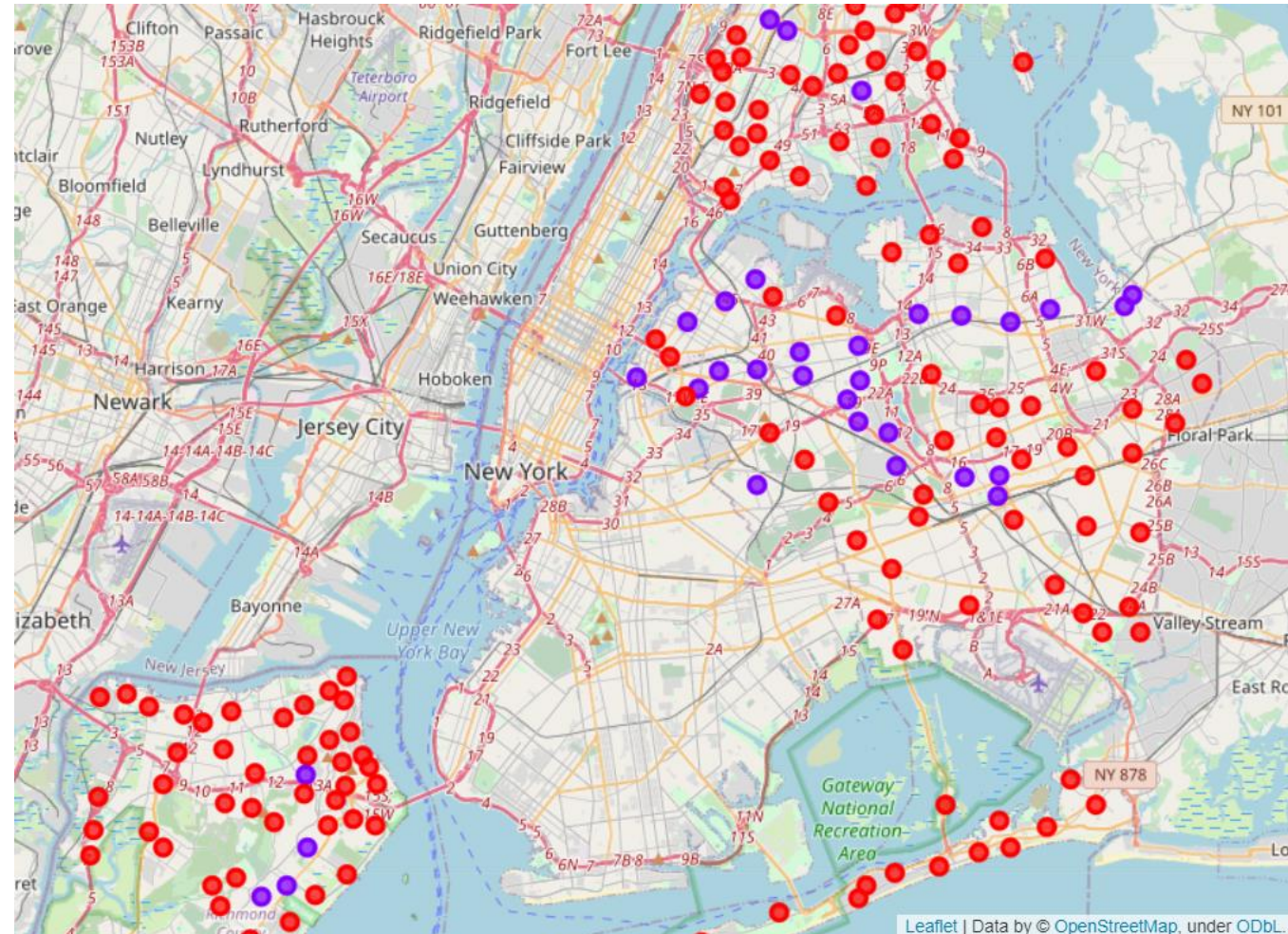




# Output

## Part 2- The Bronx, Queens and Staten Island

- Segmenting and clustering neighborhoods
- Cluster 0: the total and total sum has the smallest value. It shows that the market is not saturated.  
**Red** on map
- Cluster 1: total and total sum has a large value. It shows that the market is saturated and that there is a lot of competition.  
**Purple** on map



# Points to be noted

- There is scope to explore cuisines in various neighborhoods in The Bronx, Queens and Staten Island
- There is also scope to increase the number of farmers markets in The Bronx, Queens and Staten Island
- In Manhattan and Brooklyn, a risk can be taken with a great menu on board. There are already a lot of cuisines from various countries available
- Neighborhood- Staten Island: Todt Hill, South beach and Port Ivory

# Conclusion

- Brooklyn and Manhattan have high concentration of restaurant businesses. It is a very competitive market
- The Bronx, Staten Island and Queens also have a good number of restaurants but not as much as Brooklyn and Manhattan. Hence, these areas can be explored.
- Depending on the neighborhood or cuisine, a suitable venue with low risk and competition can be identified