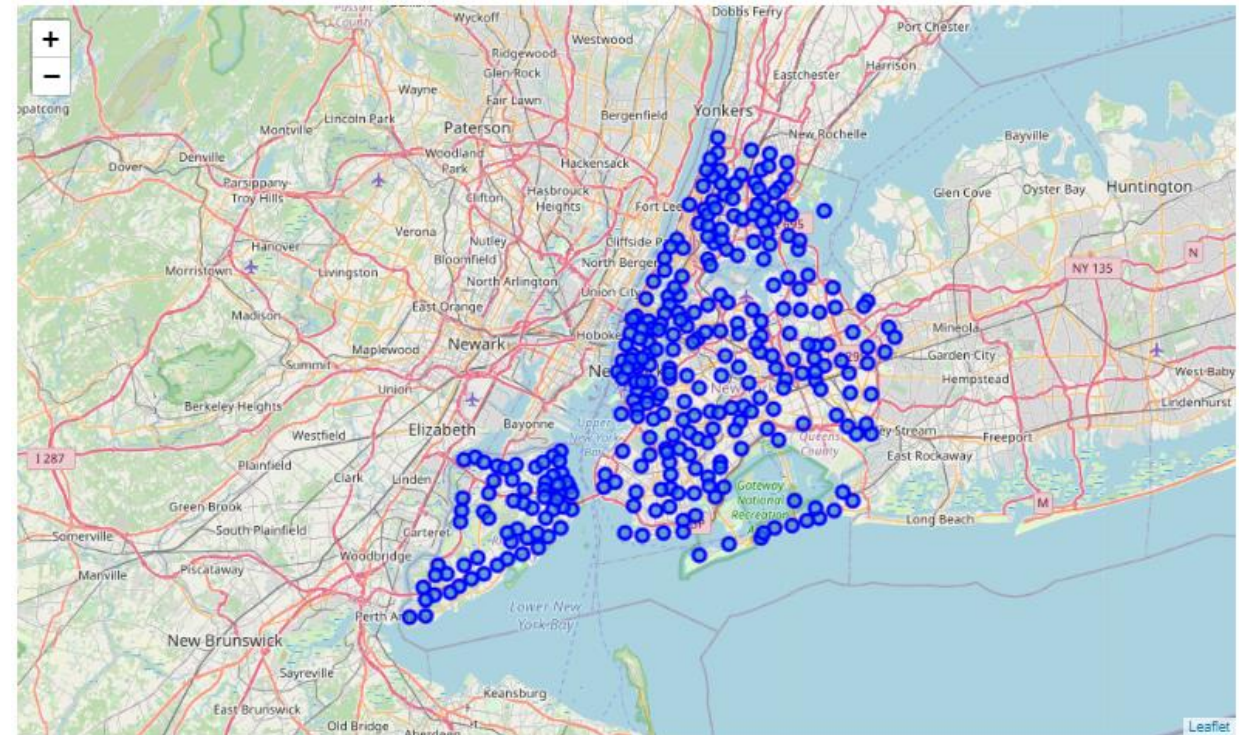# THE BATTLE OF NEIGHBOURHOODS

RESTAURANT LLC

INTRODUCTION

- New York City assessment for Restaurant LLC
- A good location for a Restaurant business
- Business problem
  - Choice of first neighbourhood to establish restaurant business
  - Easy to repeat
  - Low competition
  - High demand
- Success criteria
  - Best neighbourhood which meets above criteria

NEW YORK CITY FACTS

- Most populous city in the USA

- Multicultural

- Offers business opportunities

- Business friendly environment

- Global hub of business and commerce

- Major centre for key industries such as financial services, fashion, retailing, world trade, tourism, real estate, media, advertising, accountancy, insurance, theatre, arts etc.

NEW YORK – BUSINESS ENVIRONMENT ANALYSIS

- There are many restaurant businesses in New York thus competition is high

- A developed city which translates into high cost of doing business

- A careful analysis of any business venture in the city is mandatory

- A strategic business includes doing your homework whiche ensures

  - You reduce business risk (failure)

  - Increase return on investment

NEW YORK CITY – CUISINE BACKGROUND

- New York is known for its famous cuisine. New York's food culture has been to a large extent influenced by its large immigrant background and communities.
    - Italian immigrants brought Pizza and Italian cuisine
    - Central and Eastern European immigrants especially Jews brought bagels, delicatessens, hot dogs, cheese cake and knishes etc.
    - Irish immigrants brought corned beef
    - Chinese and South East Asian restaurants, trattorias and coffee houses are common in New York
    - Multiple mobile food vendors
    - Middle Eastern foods such as Döner, Falafel and Kebabs are examples of New York street food
    - New York is home to more than 1000 Michelin starred restaurants
    - With all this competition, it is essential to carefully plan an entry strategy for a new restaurant business in New York City

FACTORS TO CONSIDER WHEN LOCATING A RESTAURANT

- Menus of competitor restaurants

- Borough constituents

- Population of New York City

- Competitors in a particular location

- Untapped markets

- Location of high traffic facilities that attract high populations e.g. gyms, shopping malls, parks etc.

- Location of Farmers' market where ingredients can be obtained fresh and cheap to maintain quality

- New York city demographics

DATA DESCRIPTION - 1

- Data 1: neighbourhood has a total of 306 neighbourhoods and 5 boroughs. In order to segment the neighbourhoods and explore them, we will need a dataset that contains the 5 boroughs and neighbourhoods that exist in each borough. We will also need the latitude and longitude coordinates of each neighbourhood.

- The dataset exists for free on the web

  - https://geo.nyu.edu/catalog/nyu_2451_34572

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

- Data 2: The Farmers' Markets data

  - https://data.cityofnewyork.us/dataset/DOHMH-farmers-markets-and-food-boxes/8vwk-6iz2

- Definition: A farmers' market is defined as a market where local farmers and growers sell their produce directly to the public. Some of the foods found in a farmers' market include dairy products, vegetables, fish, meat, baked foods and processed foods.

	FacilityName	Service Category	Service_Type	Address	Address 2	Borough	ZipCode	Latitude	Longitude	AdditionalInfo	StartDate	EndDate	Monday	Tuesday	Wednesday	Thursday
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	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	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	NaN	NaN
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	2:30pm-6:30pm	NaN
5	175th Street Greenmarket	Farmers Markets and Food Boxes	Farmers Markets	175th St bet Wadsworth Ave & Broadway	NaN	Manhattan	10033	40.845956	-73.937813	Market open dates: 6/29/2017 to 11/30/2017	06/29/2017	11/30/2017	NaN	NaN	NaN	8am-5pm

DATA DESCRIPTION - III

- Data 3: Data from Wikipedia pages below
  - New York Population
  - Cuisine of New York
  - New York City demographics

https://en.wikipedia.org/wiki/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

	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 DESCRIPTION - IV

- Foursquare dataset

- New York City geographical coordinates data will be utilized as input for the Foursquare API which will be used to provision information of venues for each neighbourhood. We will utilize the Foursquare API to explore neighbourhoods in New York City. See below an image of the Foursquare API 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

ANALYTICAL APPROACH

- New York City has a total of 5 boroughs and 306 neighbourhoods

- Part 1- Clustering of Manhattan and Brooklyn

- Part 2 – Clustering of Bronx, Staten Island and Queens

- We will only filter restaurant data from Foursquare.com venues data for our project
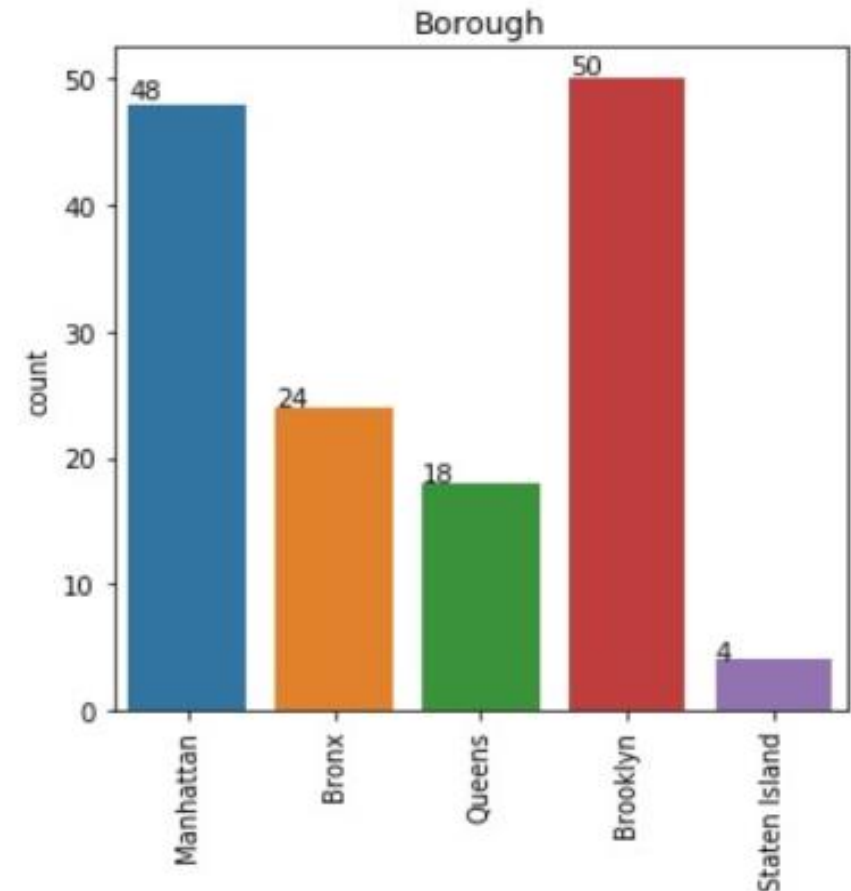
EXPLORATORY ANALYSIS – METHODOLOGY 1

- Data 1: New York Geographical coordinates data

  - Load the data and explore data – newyork_data.json

  - Transform the data of nested Python dictionaries into Pandas dataframes

  - Dataframe contains the geographical coordinates of New York city neighbourhoods

  - Data will be used to obtain venues data from Foursquare

  - Geopy and Folium libraries will be used to create a map of New York City with neighbourhoods superimposed on top
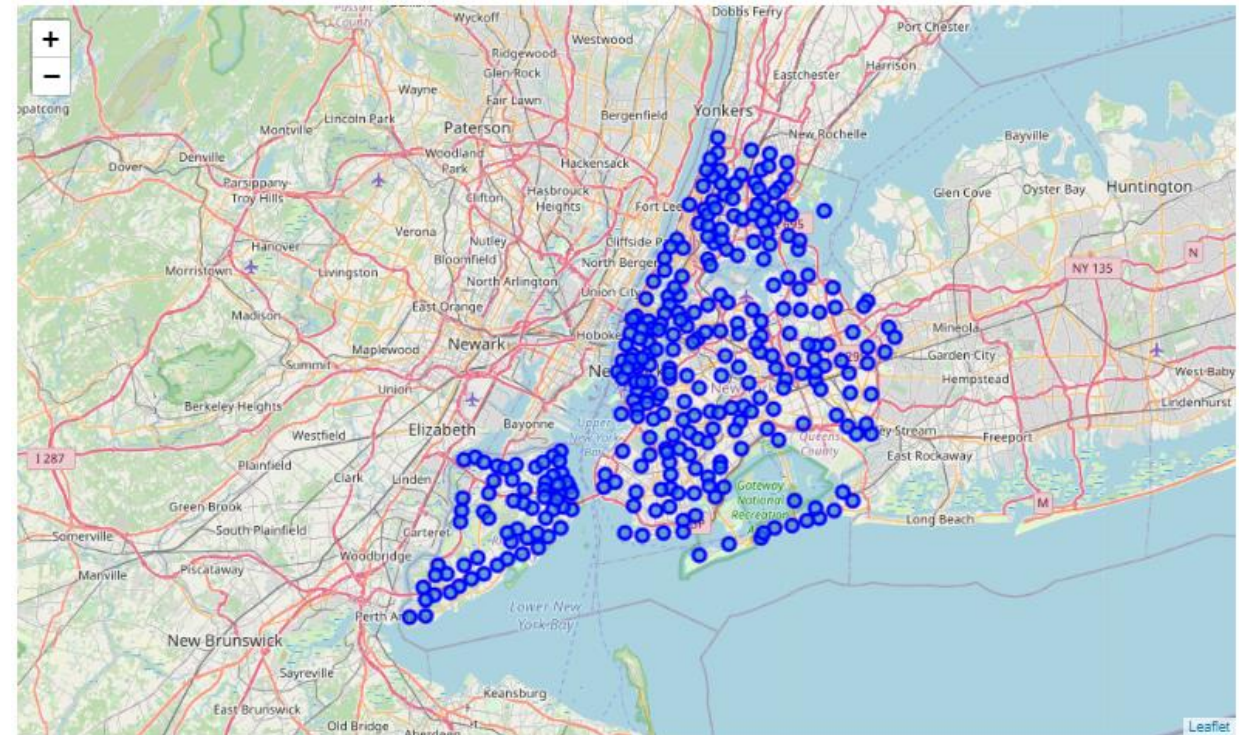
EXPLORATORY ANALYSIS – METHODOLOGY - II

- Data 2 – DOHMH Farmers Markets and Food Boxes datasets

- We will be using the dataset of Farmers Markets

- There are in total 144 Farmers Markets in New York City

- Brooklyn (50) has the highest number of markets followed by Manhattan(50), Bronx (24), Queens (18) and Staten Island (4)

EXPLORATORY ANALYSIS - METHODOLOGY - II

- Farmers Market Visualization – New York City

Map of Farmers Markets

EXPLORATORY ANALYSIS – METHODOLOGY 3

- Data 3: In order to analyze the New York City population, cuisine and demographics, we scrapped the data from Wikipedia given in the references section

- We used BeautifulSoup Python library

- Definition: BeautifulSoup is a Python package for parsing HTML and XML documents with malformed markup
  - It creates a parse tree for parsed pages that can be used to extract data from HTML and is useful for scraping

EXPLORATORY ANALYSIS – METHODOLOGY III (NEW YORK CITY POPULATION)

- Manhattan is the geographically smallest and most densely populated borough

- Manhattan's population density of 72,033 people per square mile (27,826 KM2) in 2017 made it the highest of any county in the USA and higher than any individual American city

- Brooklyn is the most populous borough (2,648,771)

- Queens is geographically the largest borough (281.09 KM2)

|	Borough	County	Estimate_2019	GrossDomesticProduct	square_miles	square_km	persons_sq_mi	squarekm	persons/sq.mi	persons/l
0	The Bronx	Bronx	1,418,207	42.695\n	30,100	42.10	109.04			
1	Brooklyn	Kings	2,559,903	91.559\n	35,800	70.82	183.42			
2	Manhattan	New York	1,628,706	600.244\n	368,500	22.83	59.13			
3	Queens	Queens	2,253,858	93.310\n	41,400	108.53	281.09			
4	Staten Island	Richmond	476,143	14.514\n	30,500	58.37	151.18			
5	City of New York	8,336,817	842.343	101,000	302.64	783.83	27,547			
6	State of New York	19,453,561	1,731.910	89,000	47,126.40	122,056.82	412			
7	Sources: [14] and see individual borough articles									

EXPLORATORY ANALYSIS – METHODOLOGY – III (NEW YORK CITY DEMOGRAPHICS)

- New York is the most populous city in the United States of America. It has a record high 8622698 residents as of the US census of 2010.

- The racial composition is shown on the table below. This explains the reason why New York City has restaurants serving cuisines from Africa, Middle East, Japan, India etc. This presents an opportunity for a restaurant business in New York.

	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%	–

EXPLORATORY ANALYSIS – METHODOLOGY III (CUISINE OF NEW YORK CITY)

- Data taken from Wikipedia (https://www.wikipedia.org/wiki/Cuisine_of_New_York_City) has been used to create wordclouds.

- Brooklyn cuisine: most preferred cuisine in Brooklyn is Mexican, Puerto Rican and Italian

- Manhattan cuisine: most preferred cuisine in Manhattan is American, Italian, Indian and Puerto Rican
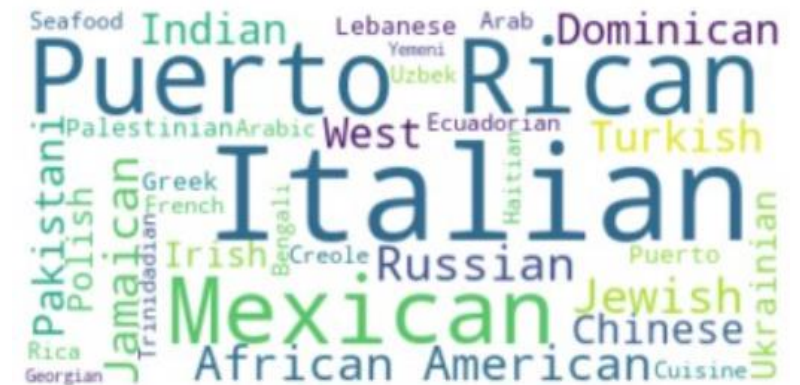
EXPLORATORY ANALYSIS – METHODOLOGY III (CUISINE OF NEW YORK CITY)

- Queens cuisine: most preferred cuisine in Queens is Mexican, Irish, Indian and Pakistani

- The Bronx cuisine: most preferred cuisine in the Bronx is Italian, Albanian, Puerto Rican and Dominican
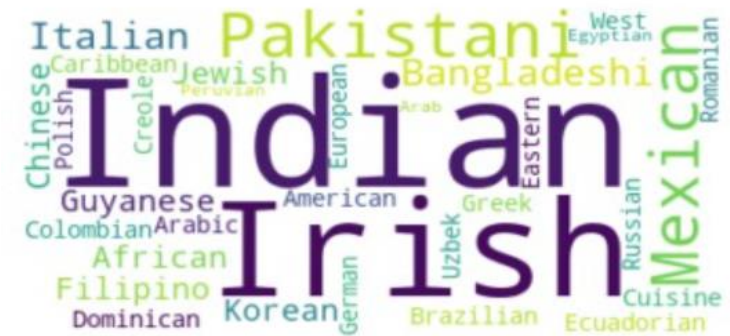
EXPLORATORY ANALYSIS – METHODOLOGY IV (FOURSQUARE.COM)

- New York city geographical coordinates data has been utilized as input for the Foursquare.com API which provides venues for each neighbourhood.

- Using the geographical coordinates of each neighbourhood Foursquare API calls are made to get top 200 venues in a radius of 1km.

EXPLORATORY ANALYSIS – METHODOLOGY IV (BROOKLYN AND MANHATTAN)

- Brooklyn and Manhattan visualization
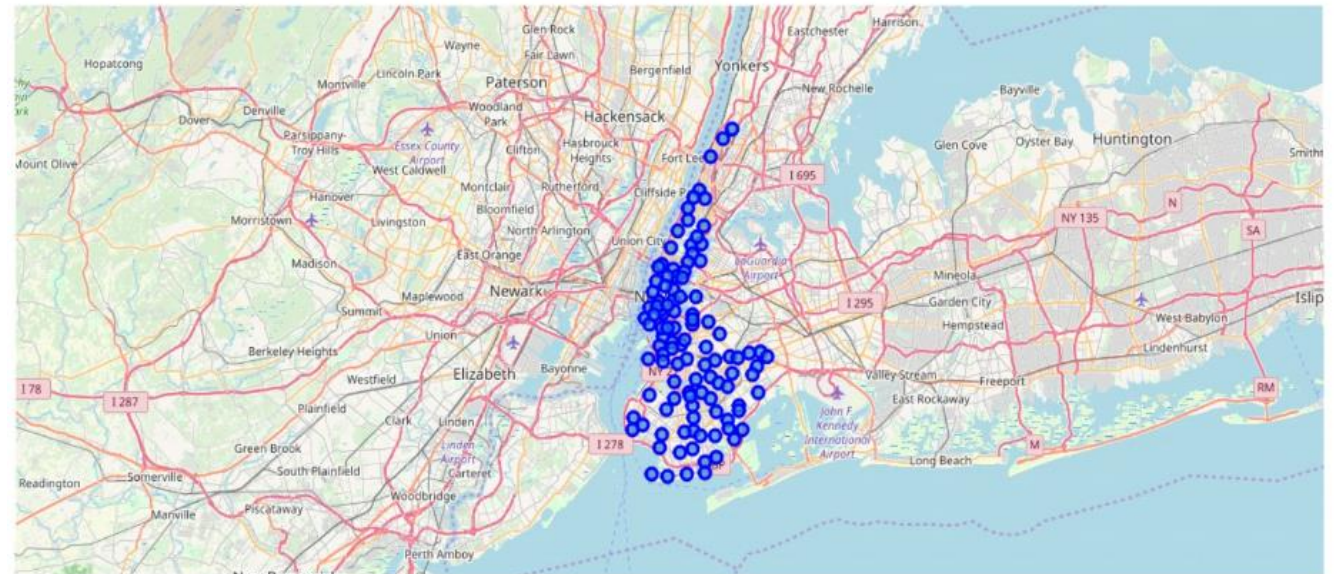
BROOKLYN AND MANHATTAN

- Brooklyn and Manhattan venues visualization. The „Brooklyn_Manhattan_venues" dataframe has 9708 venues and 397 unique venue types

|	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

BRONX, QUEENS AND STATEN ISLAND

- Bronx, Queens and Staten Island venues 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

- Bronx, Queens and Staten Island Visualization
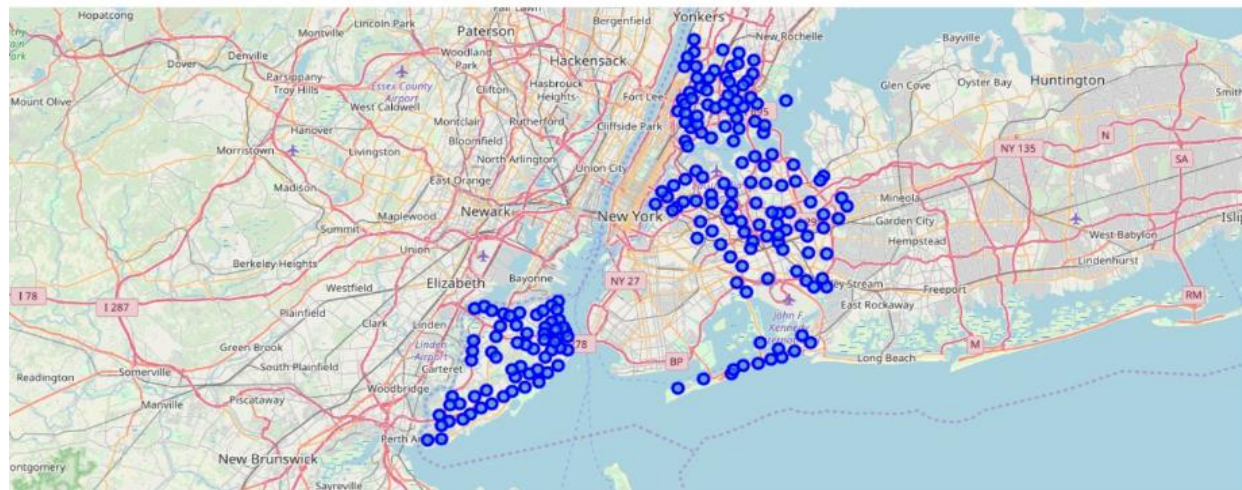
BRONX, QUEENS AND STATEN ISLAND

- Bronx, Queens and Staten Island visualization: The Bronx_Queens_Staten_Island_dataframe has 10805 venues and 387 unique venue types
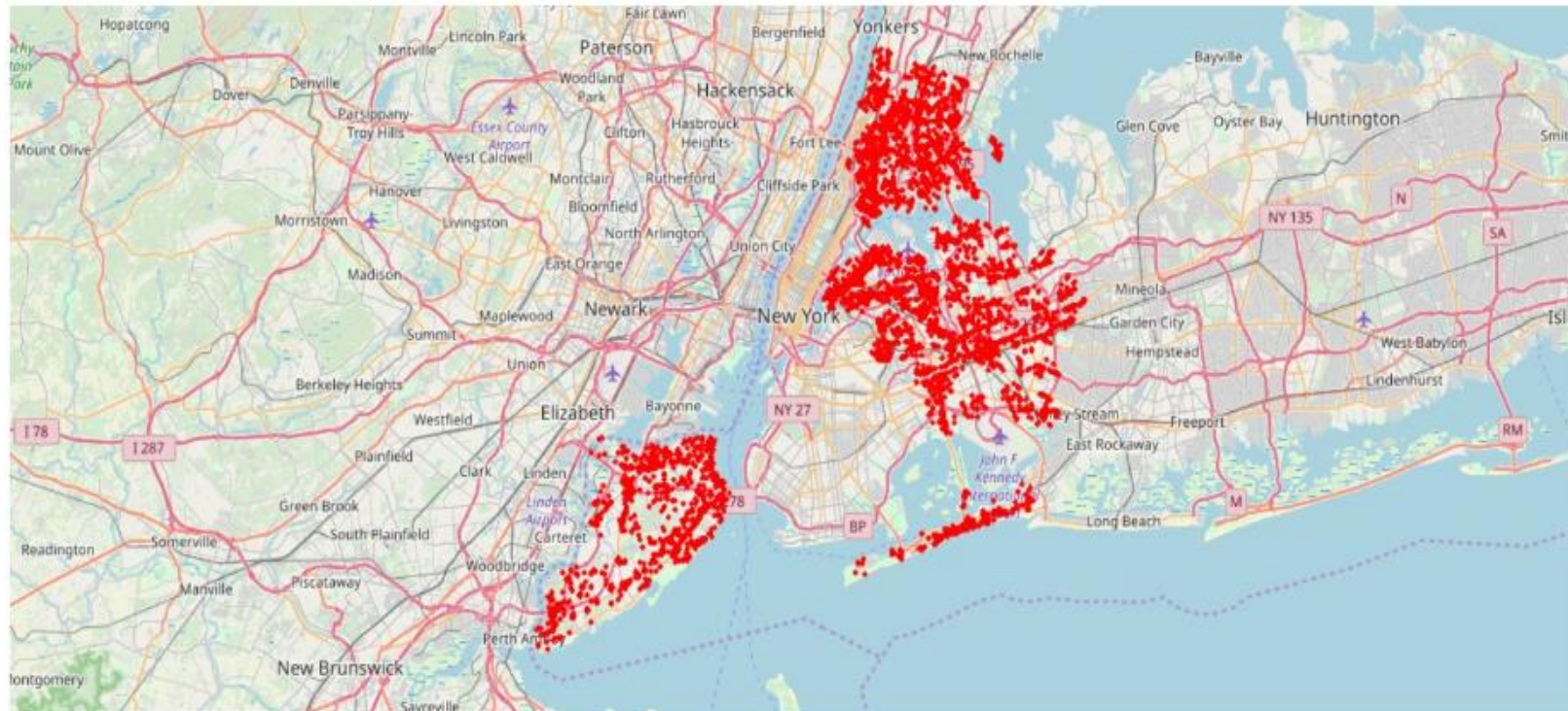
# RESULT –MANHATTAN AND BROOKLYN

- Segmenting and clustering neighbourhoods

- Cluster0: The total and total sum cluster0 has smallest value. It shows that the market is not saturated.

- Cluster1: The total and total sum is very high with a lot of competition and saturated neighbourhoods
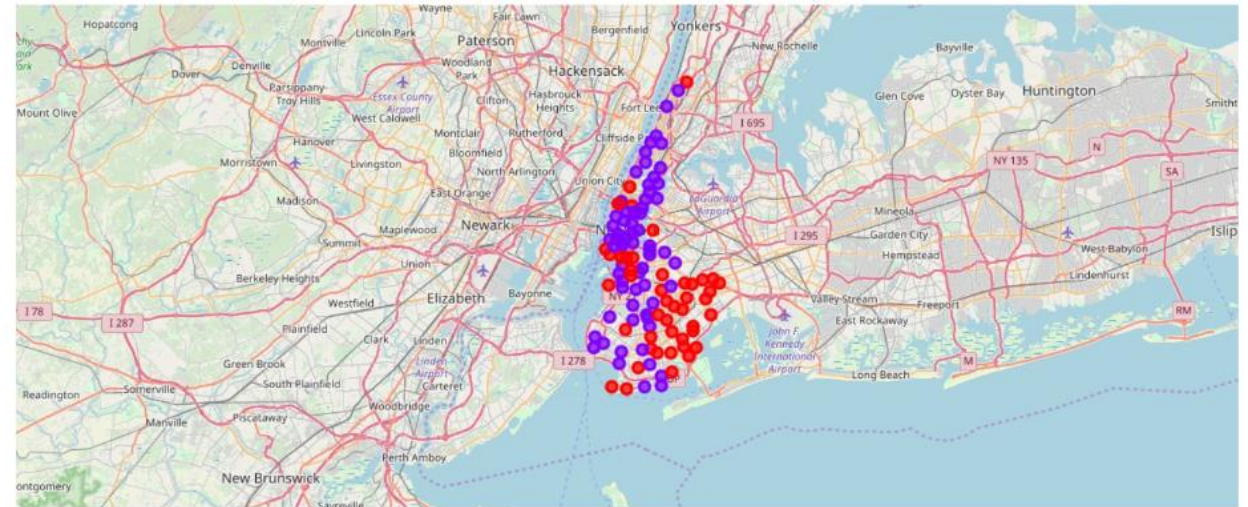
RESULT – BRONX, QUEENS AND STATEN ISLAND

- Segmenting and clustering neighbourhoods

- Cluster0: The total and total sum of cluster0 has smallest value. It shows that the market is not saturated. There is potential for opening a new restaurant business

- Cluster1: The total and total sum is very high with a lot of competition and saturated neighbourhoods
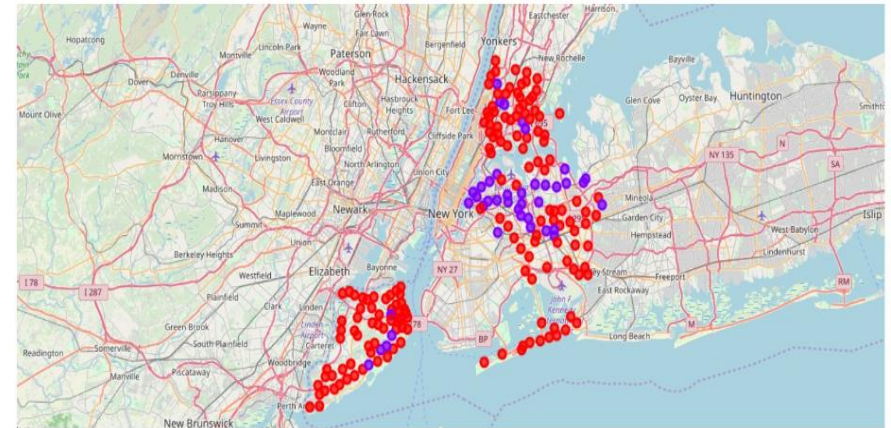
	Borough	Neighborhood	Latitude	Longitude	Total	Cluster_Labels
0	Staten Island	Todt Hill	40.597069	-74.111329	0	0
1	Staten Island	Port Ivory	40.639683	-74.174645	0	0
2	Staten Island	Bloomfield	40.605779	-74.187256	0	0

DISCUSSION

- In the end we can state emphatically that there is a case for exploring cuisines of various countries in Bronx, Queens and Staten Island

- Manhattan and Brooklyn show openness to cuisines of other countries as part of their menu. If you were to take a risk in Manhattan and Brooklyn then you will need a great menu.

- There is room for increasing the number of Farmers Markets in Bronx, Queens and Staten Island

CONCLUSION

- This analysis has a limitation of data

- The same program can be rerun using updated data or information

- Brooklyn and Manhattan have very high concentration of restaurant businesses and are competitive

- Bronx, Queens and Staten Island do not have many restaurants so there is scope for new establishments

- There is an opportunity for establishing a Puerto Rican restaurant in the Bronx