

# Coursera Capstone project:

## Choice of Neighborhood for Business in New York City

### Introduction

New York City (NYC), is the most populous city in the United States. With an estimated 2018 population of 8,398,748 distributed over a land area of about 302.6 square miles (784 km<sup>2</sup>), New York is also the most densely populated major city in the United States, located at the southern tip of the state of New York. New York City has been described as the cultural, financial, and media capital of the world, and exerts a significant impact upon commerce, entertainment, research, technology, education, politics, tourism, art, fashion, and sports. New York City encompasses five county-level administrative divisions called boroughs: The Bronx, Brooklyn, Manhattan, Queens, and Staten Island.

To whoever's planning to do business in New York City, especially in the food services and want to open a restaurant in one of the NY City Boroughs and wondering which of Manhattan and The Bronx Boroughs would be the best to implement an African Restaurant, gain more customers and stay competitive; We will explore, analyze and compare for you all the neighborhoods inside Manhattan and The Bronx and will recommend to you the best emplacement to implement your business.

The following work will be the continued analysis and exploration of Neighborhoods provided by IBM's Skilled Network Labs, being the part of my Coursera Capstone project, I am working on to obtain the IBM professional certification in Data Science.

### Data Collection and processing

#### Data set

We will extract NYC dataset from [https://geo.nyu.edu/catalog/nyu\\_2451\\_34572](https://geo.nyu.edu/catalog/nyu_2451_34572). This dataset contains the five boroughs and the neighborhoods that exist in each borough as well as the latitude and longitude coordinates of each neighborhood.

we are going to start utilizing the Foursquare API to explore the neighborhoods and segment them, then use the explore function to get the most common venue categories in each neighborhood, and then use this feature to group the neighborhoods into clusters. We will use the k-means clustering algorithm to complete this task.

Finally, we will use the Folium library to visualize the neighborhoods in Manhattan and The Bronx Boroughs and their emerging clusters.

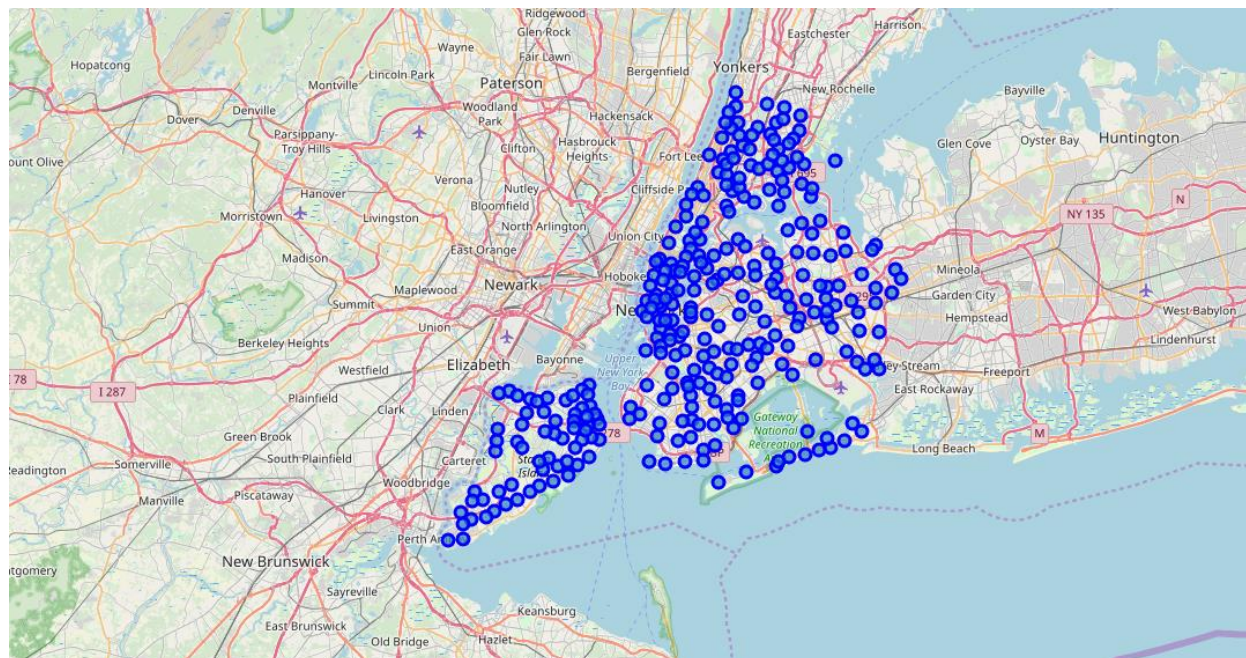
## Data process

We began by importing necessary libraries in Python Notebook through IBM Watson Studio (cloud), and then download the NY City dataset from [https://geo.nyu.edu/catalog/nyu\\_2451\\_34572](https://geo.nyu.edu/catalog/nyu_2451_34572). Once the data loaded, it is then processed to get the pandas data frame needed for exploration.

The NYC dataframe has 5 boroughs and 306 neighborhoods. Here is an illustration of the first five rows of the table:

	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

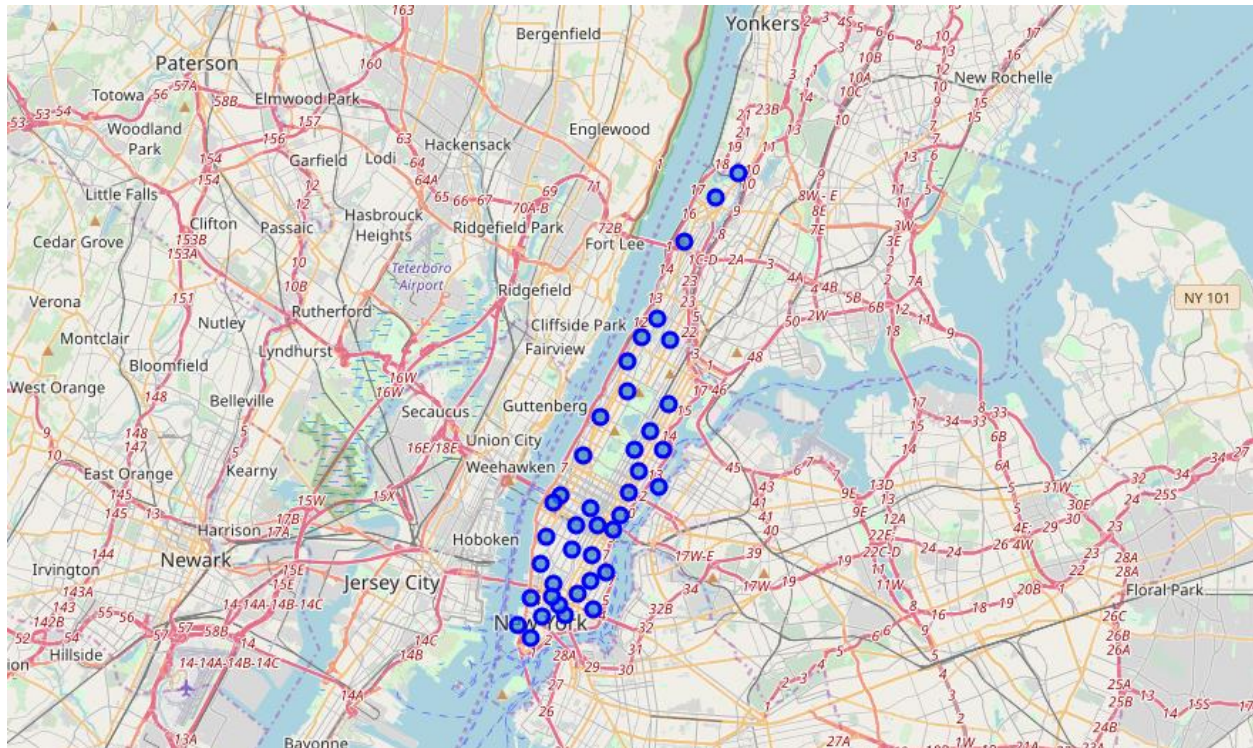
We use geopy library to get the latitude and longitude values of New York City, which are 40.712728, -74.0060152, helping us to create the map of New York as shown below.



# Segmentation and clustering of Neighborhoods of NYC

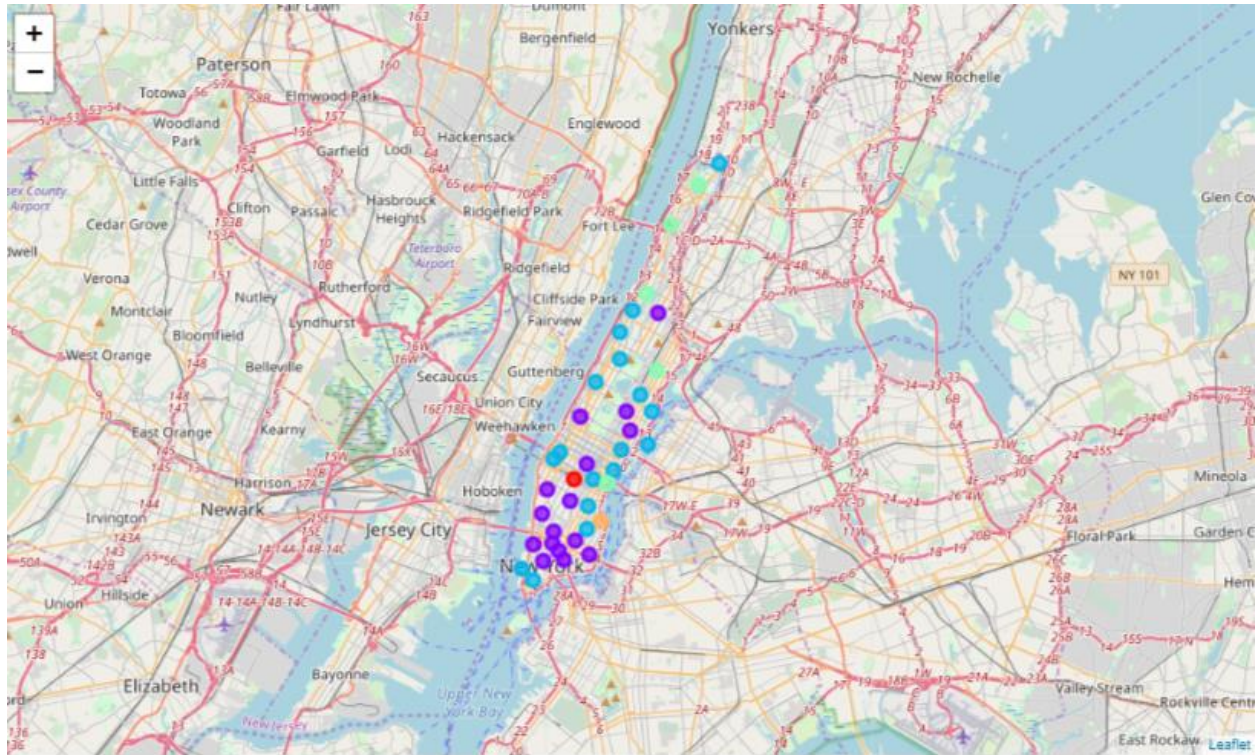
## 1. Manhattan Borough

After creating a new data frame of the Manhattan data, get the geographical coordinates of Manhattan, we can visualize Manhattan neighborhoods on the map as follow:



With Foursquare API we have explored the neighborhoods of Manhattan and found 40 Neighborhoods, 3,309 venues and 330 unique categories. The Neighborhood has been segmented in five clusters demonstrating the ten most common venues for each cluster, visualized in the map below:





The result of the five clusters a listed as in the following tables:

Cluster 1:

	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
33	Midtown South	Korean Restaurant	Hotel	Hotel Bar	Japanese Restaurant	Dessert Shop	Coffee Shop	Cosmetics Shop	American Restaurant	Cocktail Bar	Scenic Lookout

Cluster 2:

	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
1	Chinatown	Chinese Restaurant	Cocktail Bar	American Restaurant	Bakery	Spa	Optical Shop	Salon / Barbershop	Hotpot Restaurant	Vietnamese Restaurant	Malay Restaurant
6	Central Harlem	Chinese Restaurant	French Restaurant	African Restaurant	American Restaurant	Bar	Cosmetics Shop	Seafood Restaurant	Gym	Library	Bookstore
8	Upper East Side	Italian Restaurant	Exhibit	Art Gallery	Bakery	Gym / Fitness Center	Juice Bar	French Restaurant	Hotel	Coffee Shop	Pizza Place
10	Lenox Hill	Coffee Shop	Pizza Place	Italian Restaurant	Sushi Restaurant	Cocktail Bar	Burger Joint	Gym	Gym / Fitness Center	Café	Cosmetics Shop
13	Lincoln Square	Theater	Italian Restaurant	Concert Hall	Café	Plaza	Performing Arts Venue	Park	Gym / Fitness Center	Indie Movie Theater	French Restaurant
15	Midtown	Hotel	Sporting Goods Shop	Coffee Shop	Clothing Store	Bakery	Theater	Café	Steakhouse	Cocktail Bar	Bookstore
17	Chelsea	Coffee Shop	Italian Restaurant	Ice Cream Shop	Bakery	Theater	American Restaurant	Art Gallery	Hotel	Nightclub	Bookstore
18	Greenwich Village	Italian Restaurant	Clothing Store	Sushi Restaurant	Café	Indian Restaurant	Seafood Restaurant	French Restaurant	Caribbean Restaurant	Gourmet Shop	Boutique
20	Lower East Side	Coffee Shop	Pizza Place	Café	Chinese Restaurant	Art Gallery	Japanese Restaurant	Ramen Restaurant	Cocktail Bar	Bakery	Theater
21	Tribeca	American Restaurant	Park	Italian Restaurant	Café	Spa	Wine Bar	Coffee Shop	Greek Restaurant	Men's Store	Playground
22	Little Italy	Bakery	Café	Salon / Barbershop	Bubble Tea Shop	Italian Restaurant	Cocktail Bar	Sandwich Place	Mediterranean Restaurant	Spa	Chinese Restaurant
23	Soho	Clothing Store	Boutique	Art Gallery	Women's Store	Sporting Goods Shop	Furniture / Home Store	Mediterranean Restaurant	Men's Store	Italian Restaurant	Shoe Store
24	West Village	Italian Restaurant	New American Restaurant	Cosmetics Shop	Park	American Restaurant	Cocktail Bar	Wine Bar	Bakery	Jazz Club	Theater
31	Noho	Italian Restaurant	French Restaurant	Pizza Place	Cocktail Bar	Rock Club	Hotel	Coffee Shop	Bookstore	American Restaurant	Mexican Restaurant
32	Civic Center	Gym / Fitness Center	Coffee Shop	Hotel	French Restaurant	Italian Restaurant	Bakery	Sandwich Place	Cocktail Bar	Yoga Studio	Spa
38	Flatiron	Yoga Studio	Gym / Fitness Center	Café	American Restaurant	Japanese Restaurant	Mediterranean Restaurant	Clothing Store	Coffee Shop	Spa	New American Restaurant

Cluster 3:

	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	Marble Hill	Sandwich Place	Coffee Shop	Yoga Studio	Diner	Miscellaneous Shop	Steakhouse	Supplement Shop	Shopping Mall	Seafood Restaurant	Tennis Stadium
5	Manhattanville	Coffee Shop	Deli / Bodega	Park	Mexican Restaurant	Italian Restaurant	Seafood Restaurant	Dumpling Restaurant	Café	Sushi Restaurant	Lounge
9	Yorkville	Gym	Italian Restaurant	Coffee Shop	Bar	Pizza Place	Deli / Bodega	Mexican Restaurant	Japanese Restaurant	Diner	Sushi Restaurant
11	Roosevelt Island	Sandwich Place	Dog Run	Scenic Lookout	Gym	Coffee Shop	Greek Restaurant	Outdoors & Recreation	Liquor Store	School	Park
12	Upper West Side	Italian Restaurant	Bar	Wine Bar	Coffee Shop	Bakery	Indian Restaurant	Mediterranean Restaurant	Café	Restaurant	Bookstore
14	Clinton	Theater	Gym / Fitness Center	Italian Restaurant	Coffee Shop	American Restaurant	Spa	Sandwich Place	Hotel	Gym	Wine Shop
16	Murray Hill	Sandwich Place	Coffee Shop	American Restaurant	Japanese Restaurant	Gym / Fitness Center	Bar	Hotel	Sushi Restaurant	Italian Restaurant	Pizza Place
19	East Village	Bar	Ice Cream Shop	Chinese Restaurant	Mexican Restaurant	Wine Bar	Pizza Place	Cocktail Bar	Coffee Shop	Ramen Restaurant	Italian Restaurant
25	Manhattan Valley	Bar	Indian Restaurant	Mexican Restaurant	Pizza Place	Coffee Shop	Thai Restaurant	Plaza	Peruvian Restaurant	Deli / Bodega	Playground
26	Morningside Heights	Park	Bookstore	Coffee Shop	American Restaurant	Deli / Bodega	Sandwich Place	Café	Food Truck	Burger Joint	Ethiopian Restaurant
27	Gramercy	Italian Restaurant	Bagel Shop	Bar	Mexican Restaurant	Thai Restaurant	Thrift / Vintage Store	Pizza Place	Comedy Club	American Restaurant	Hotel
28	Battery Park City	Coffee Shop	Park	Hotel	Gym	Memorial Site	Clothing Store	Food Court	Boat or Ferry	Shopping Mall	Sandwich Place
29	Financial District	Coffee Shop	Bar	American Restaurant	Food Truck	Gym	Hotel	Pizza Place	Steakhouse	Cocktail Bar	Italian Restaurant
30	Carnegie Hill	Coffee Shop	Café	Pizza Place	Gym	Bookstore	Cosmetics Shop	Bakery	French Restaurant	Japanese Restaurant	Yoga Studio
34	Sutton Place	Gym / Fitness Center	Italian Restaurant	Furniture / Home Store	Coffee Shop	Gym	Mexican Restaurant	Sushi Restaurant	Grocery Store	Ice Cream Shop	Indian Restaurant
35	Turtle Bay	Italian Restaurant	Steakhouse	Sushi Restaurant	Coffee Shop	Wine Bar	Indian Restaurant	French Restaurant	Park	Japanese Restaurant	Café
39	Hudson Yards	American Restaurant	Hotel	Italian Restaurant	Gym / Fitness Center	Coffee Shop	Café	Bar	Dog Run	Restaurant	Thai Restaurant

#### Cluster 4:

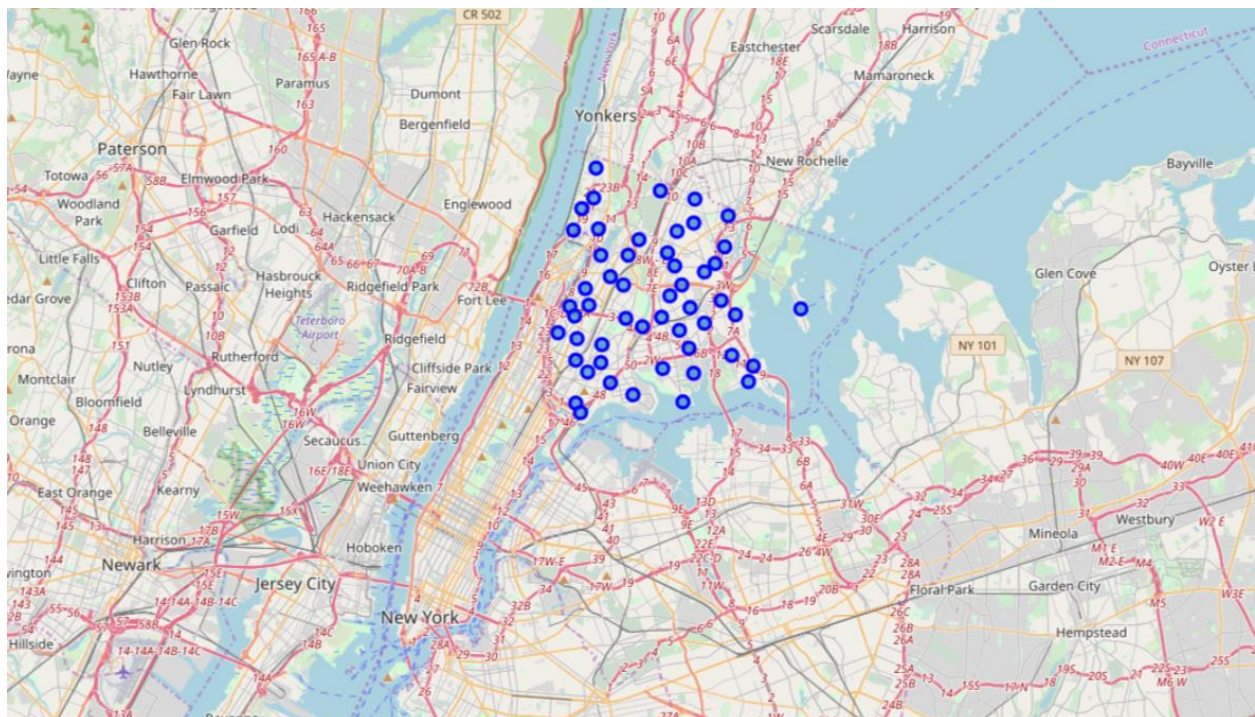
	Neighborhood	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue	9th Most Common Venue	10th Most Common Venue
2	Washington Heights	Café	Grocery Store	Bakery	Deli / Bodega	Mobile Phone Shop	Mexican Restaurant	Spanish Restaurant	Chinese Restaurant	Supermarket	Supplement Shop
3	Inwood	Mexican Restaurant	Café	Pizza Place	Lounge	Restaurant	Chinese Restaurant	Park	Spanish Restaurant	Bakery	Frozen Yogurt Shop
4	Hamilton Heights	Pizza Place	Deli / Bodega	Café	Coffee Shop	Mexican Restaurant	Yoga Studio	Park	Sushi Restaurant	School	Cocktail Bar
7	East Harlem	Mexican Restaurant	Bakery	Latin American Restaurant	Thai Restaurant	Pizza Place	Pharmacy	Deli / Bodega	Grocery Store	Cocktail Bar	French Restaurant
36	Tudor City	Café	Park	Mexican Restaurant	Pizza Place	Greek Restaurant	Diner	Coffee Shop	Deli / Bodega	Asian Restaurant	Sushi Restaurant

## Cluster 5:

	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
37	Stuyvesant Town	Bar	Park	Fountain	Gas Station	Gym / Fitness Center	Baseball Field	German Restaurant	Harbor / Marina	Cocktail Bar	Coffee Shop

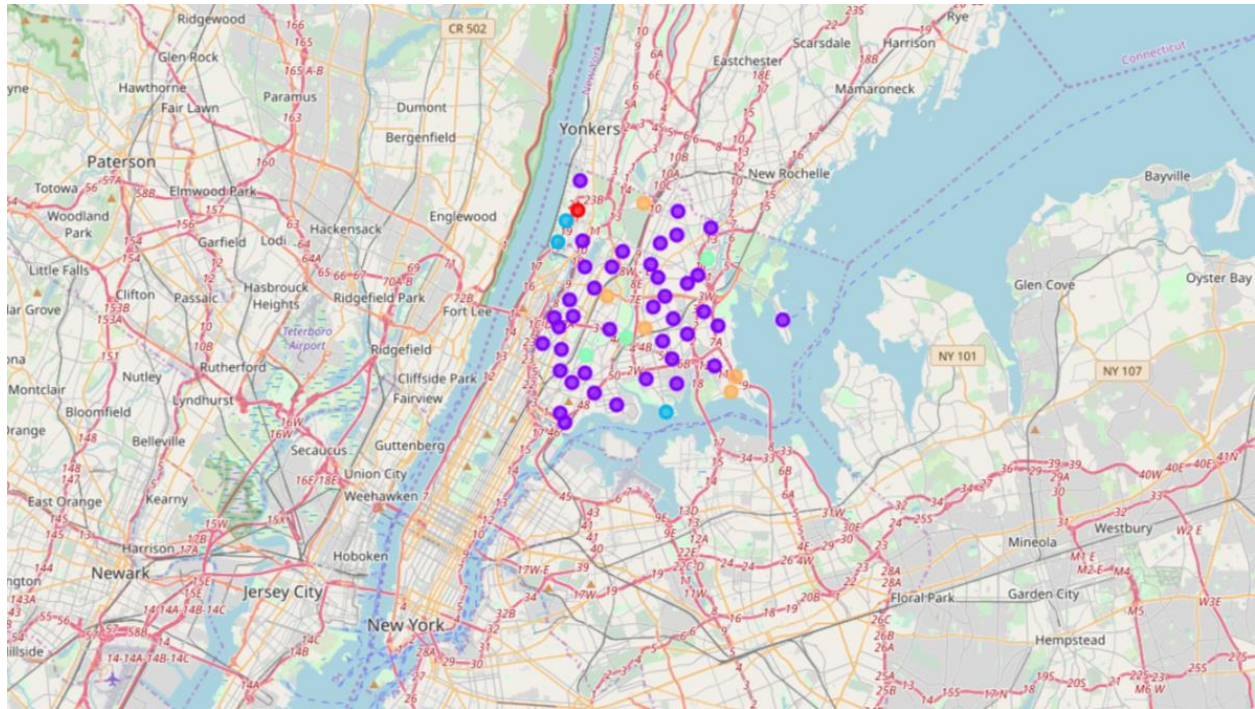
## 2. The Bronx Borough

After creating a new data frame of The Bronx data, get the geographical coordinates of The Bronx, we can visualize The Bronx neighborhoods on the map as follow:



With Foursquare API we have explored the neighborhoods of The Bronx and found 52 Neighborhoods, 1,227 venues and 171 unique categories. The Neighborhood has been segmented in five clusters demonstrating the ten most common venues for each cluster, visualized in the map below:





The result of the five clusters a listed as in the following tables:

Cluster 1:

	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
3	Fieldston	Plaza	Bus Station	Women's Store	Donut Shop	Fish & Chips Shop	Film Studio	Fast Food Restaurant	Farmers Market	Eye Doctor	Electronics Store

Cluster 2:

	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	Wakefield	Pharmacy	Gas Station	Laundromat	Ice Cream Shop	Dessert Shop	Food	Sandwich Place	Caribbean Restaurant	Donut Shop	Fast Food Restaurant
2	Eastchester	Caribbean Restaurant	Deli / Bodega	Diner	Bus Station	Bowling Alley	Cosmetics Shop	Pizza Place	Platform	Chinese Restaurant	Donut Shop
5	Kingsbridge	Pizza Place	Sandwich Place	Bar	Latin American Restaurant	Supermarket	Bakery	Mexican Restaurant	Liquor Store	Pharmacy	Spanish Restaurant
7	Nonwood	Pizza Place	Chinese Restaurant	Park	Bank	Pharmacy	Pet Store	Fast Food Restaurant	Liquor Store	Spanish Restaurant	Mexican Restaurant
8	Williamsbridge	Caribbean Restaurant	Nightclub	Soup Place	Supermarket	Bar	Donut Shop	Film Studio	Fast Food Restaurant	Farmers Market	Eye Doctor
9	Baychester	Donut Shop	Pizza Place	Supermarket	Convenience Store	Discount Store	Moving Target	Sandwich Place	Mexican Restaurant	Men's Store	Electronics Store
10	Pelham Parkway	Pizza Place	Italian Restaurant	Frozen Yogurt Shop	Bank	Coffee Shop	Chinese Restaurant	Donut Shop	Sandwich Place	Café	Eye Doctor
11	City Island	Harbor / Marina	Seafood Restaurant	Thrift / Vintage Store	Baseball Field	History Museum	Ice Cream Shop	Italian Restaurant	Jewelry Store	French Restaurant	Music Venue
12	Bedford Park	Deli / Bodega	Chinese Restaurant	Diner	Bus Station	Pizza Place	Sandwich Place	Mexican Restaurant	Supermarket	Bar	Park
13	University Heights	Pizza Place	Fried Chicken Joint	Bakery	Fast Food Restaurant	Chinese Restaurant	Cosmetics Shop	Bus Station	Sandwich Place	Pharmacy	Optical Shop
14	Morris Heights	Chinese Restaurant	Pharmacy	Latin American Restaurant	Pizza Place	Spanish Restaurant	Plaza	Grocery Store	Bus Station	Clothing Store	Bank
15	Fordham	Mobile Phone Shop	Donut Shop	Gym / Fitness Center	Shoe Store	Pizza Place	Fast Food Restaurant	Bank	Supplement Shop	Pharmacy	Spanish Restaurant
16	East Tremont	Pizza Place	Cosmetics Shop	Mobile Phone Shop	Breakfast Spot	Shoe Store	Spanish Restaurant	Lounge	Donut Shop	Supermarket	Food
18	High Bridge	Chinese Restaurant	Pharmacy	Pizza Place	Bus Station	Food	Food Truck	Deli / Bodega	Donut Shop	Sandwich Place	Seafood Restaurant
19	Melrose	Pharmacy	Pizza Place	Supermarket	Sandwich Place	Gym	Grocery Store	Gym / Fitness Center	Art Gallery	Mexican Restaurant	Deli / Bodega
20	Mott Haven	Pizza Place	Gym	Donut Shop	Spanish Restaurant	Burger Joint	Peruvian Restaurant	Storage Facility	Latin American Restaurant	Baseball Field	Chinese Restaurant
21	Port Morris	Spanish Restaurant	Furniture / Home Store	Peruvian Restaurant	Restaurant	Distillery	Donut Shop	Brewery	Storage Facility	Food Truck	Latin American Restaurant
22	Longwood	Sandwich Place	Donut Shop	Wine Shop	Deli / Bodega	Fast Food Restaurant	Diner	Grocery Store	Latin American Restaurant	Film Studio	Farmers Market
23	Hunts Point	Food	Gourmet Shop	Farmers Market	Spanish Restaurant	Café	Restaurant	Bank	Juice Bar	BBQ Joint	Bakery
24	Morrisania	Discount Store	Pizza Place	Fast Food Restaurant	Donut Shop	Grocery Store	Seafood Restaurant	Fish Market	Bus Station	Food Truck	Metro Station
25	Soundview	Chinese Restaurant	Liquor Store	Grocery Store	Discount Store	Bus Station	Bus Stop	Basketball Court	Latin American Restaurant	Fried Chicken Joint	Burger Joint
28	Country Club	Sandwich Place	Spa	Flea Market	Playground	Weight Loss Center	Cupcake Shop	Doctor's Office	Cosmetics Shop	Fast Food Restaurant	Farmers Market
29	Parkchester	Supermarket	Pizza Place	Kids Store	Chinese Restaurant	Bank	Caribbean Restaurant	American Restaurant	Food Truck	Martial Arts Dojo	Mattress Store
30	Westchester Square	Fast Food Restaurant	Sandwich Place	Pharmacy	Donut Shop	Pizza Place	Health & Beauty Service	Pub	Building	Metro Station	Mexican Restaurant
32	Morris Park	Pizza Place	Bakery	Burger Joint	Deli / Bodega	Sandwich Place	Liquor Store	Buffet	Food Truck	Restaurant	Juice Bar



35	North Riverdale	Pizza Place	Italian Restaurant	Bank	Coffee Shop	Bagel Shop	Sandwich Place	Donut Shop	Chinese Restaurant	Pool	Sushi Restaurant
36	Pelham Bay	Diner	Italian Restaurant	Bank	Gym / Fitness Center	Sandwich Place	Convenience Store	Deli / Bodega	Donut Shop	Lawyer	Fast Food Restaurant
37	Schuylerville	Pharmacy	Pizza Place	Diner	Mexican Restaurant	Bank	Donut Shop	Sandwich Place	Fast Food Restaurant	Sushi Restaurant	Bar
39	Castle Hill	Bank	Pharmacy	Deli / Bodega	Pizza Place	Market	Diner	Baseball Field	Women's Store	Fish & Chips Shop	Film Studio
40	Olinville	Deli / Bodega	Supermarket	Caribbean Restaurant	Pizza Place	Laundromat	Food	Chinese Restaurant	Liquor Store	Basketball Court	Fried Chicken Joint
41	Pelham Gardens	Pharmacy	Bus Station	Spanish Restaurant	Pizza Place	Donut Shop	Construction & Landscaping	Bank	Boat or Ferry	Sandwich Place	Chinese Restaurant
42	Concourse	Grocery Store	Metro Station	Deli / Bodega	Spanish Restaurant	Chinese Restaurant	Italian Restaurant	Pizza Place	Fried Chicken Joint	Sandwich Place	Fast Food Restaurant
43	Unionport	Latin American Restaurant	Ice Cream Shop	Donut Shop	Pizza Place	Diner	Comfort Food Restaurant	Discount Store	Chinese Restaurant	Caribbean Restaurant	Mobile Phone Shop
44	Edenwald	Pizza Place	Grocery Store	Food	Supermarket	Gas Station	Athletics & Sports	Gift Shop	Fish Market	Dessert Shop	Fast Food Restaurant
46	Concourse Village	Sandwich Place	Chinese Restaurant	Mexican Restaurant	Fast Food Restaurant	Bus Station	Sporting Goods Shop	Pharmacy	Deli / Bodega	Coffee Shop	Clothing Store
47	Mount Eden	Supermarket	Pharmacy	Fast Food Restaurant	Chinese Restaurant	Spanish Restaurant	Pizza Place	Food Truck	Latin American Restaurant	Fried Chicken Joint	Intersection
48	Mount Hope	Grocery Store	Spanish Restaurant	Sandwich Place	Deli / Bodega	Ice Cream Shop	Clothing Store	Burger Joint	Video Game Store	Supermarket	Donut Shop
49	Bronxville	Spanish Restaurant	Bank	Pizza Place	Performing Arts Venue	Paper / Office Supplies Store	Chinese Restaurant	Eastern European Restaurant	Mexican Restaurant	Breakfast Spot	Supermarket
50	Allerton	Pizza Place	Chinese Restaurant	Supermarket	Bakery	Deli / Bodega	Dessert Shop	Playground	Discount Store	Pharmacy	Check Cashing Service
51	Kingsbridge Heights	Pizza Place	Mexican Restaurant	Chinese Restaurant	Spanish Restaurant	Coffee Shop	Food Truck	Bus Station	School	Sandwich Place	Café

### Cluster 3:

	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
4	Riverdale	Park	Medical Supply Store	Bank	Home Service	Plaza	Gym	Bus Station	Food Truck	Moving Target	Fast Food Restaurant
26	Clason Point	Park	South American Restaurant	Pool	Boat or Ferry	Grocery Store	Bus Stop	Donut Shop	Film Studio	Fast Food Restaurant	Farmers Market
34	Spuyten Duyvil	Park	Pharmacy	Tennis Stadium	Bus Line	Intersection	Bank	Thai Restaurant	Film Studio	Fast Food Restaurant	Farmers Market

### Cluster 4:

	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
1	Co-op City	Bus Station	Baseball Field	Fast Food Restaurant	Pharmacy	Bagel Shop	Restaurant	Discount Store	Basketball Court	Grocery Store	Park
17	West Farms	Bus Station	Donut Shop	Park	Chinese Restaurant	Bus Stop	Lounge	Scenic Lookout	Latin American Restaurant	Basketball Court	Sandwich Place
45	Claremont Village	Bus Station	Grocery Store	Bakery	Chinese Restaurant	Food	Liquor Store	Supermarket	Caribbean Restaurant	Fried Chicken Joint	Restaurant

### Cluster 5:

	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
6	Woodlawn	Pizza Place	Pub	Deli / Bodega	Food & Drink Shop	Playground	Cosmetics Shop	Bar	Donut Shop	Rental Car Location	Italian Restaurant
27	Throgs Neck	Deli / Bodega	Coffee Shop	Liquor Store	Sports Bar	Bar	Italian Restaurant	Asian Restaurant	Juice Bar	Pizza Place	American Restaurant
31	Van Nest	Deli / Bodega	Pizza Place	BBQ Joint	Coffee Shop	Caribbean Restaurant	Donut Shop	Bus Station	Middle Eastern Restaurant	Film Studio	Food Truck
33	Belmont	Italian Restaurant	Deli / Bodega	Pizza Place	Bakery	Dessert Shop	Mexican Restaurant	Donut Shop	Bank	Bar	Coffee Shop
38	Edgewater Park	Italian Restaurant	Deli / Bodega	Pizza Place	Donut Shop	Park	Coffee Shop	Pub	Liquor Store	Sports Bar	Bar

## Comparison of cluster results between Manhattan and The Bronx Boroughs

Manhattan counts 40 Neighborhoods, 3,309 venues and 330 unique categories, where The Bronx counts 52 Neighborhoods, 1,227 venues and 171 unique categories. This first comparison shows that Manhattan is more attractive for Business, creativity and entrepreneurship than The Bronx. Manhattan counts less Neighborhoods but holds a lot of venues and unique categories of business than The Bronx.

Where the number of Neighborhoods in cluster 1 is the same (one) for Manhattan and The Bronx, Manhattan count 16 Neighborhoods and The Bronx count 40 Neighborhoods in their cluster 2. Even in the next clusters 3, 4 and 5, concentration or similarity is very high in The Bronx, showing that competition is very present in its Neighborhoods than in Manhattan.

When we look to the most common venues in each Borough, we find that American Restaurants, Chinese Restaurants, Mexican Restaurants, Italian Restaurants or French Restaurants are listed in the Manhattan Neighborhoods, but with a low frequency of these venues (less than 0.10 by Neighborhood). Within The Bronx, the same venues (restaurants) are sorted in great number with a high frequency (more than 0.10 by Neighborhood). But an African Restaurant is rarely sorted as a most common venue in Both Boroughs.

## **Conclusion**

Upon the above results and the comparison held, we can conclude that Manhattan is the best place to implement an African Restaurant as the competition is less for this business categories in each Neighborhood scripted.

But we cannot be sure that this assumption is the only truth or enough to decide upon it. Advanced researches and studies are recommended to be confident. We could need to know how many people in Manhattan have a link to Africa or would be attracted by African food specialties, is there in Manhattan some other restaurant offering such services but were not recorded by Foursquare, what is the real competition status or the common challenges faced by all the Restaurant Business holders in Manhattan, regardless of food specialties offered, ....?

We conclude this report, saying that this study must be continued for the best decision making.

## **Report written by**

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