Batte Of The Neighborhoods

An analysis of New York Restaurant Distribution

Introduction & Business Problem:

Problem Background:

The City of New York , is the most populous city in the United States. It is diverse and is the financial capital of USA. It is multicultural. It provides lot of business opportunities and business friendly environment. It has attracted many different players into the market. It is a global hub of business and commerce. The city is a major centre for banking and finance, retailing, world trade, transportation, tourism, real estate, new media, traditional media, advertising, legal service

New York City's food culture includes an array of international cuisines influenced by the city's immigrant history. Central and Eastern European immigrants, specialty Jewish immigrants from those regions, brought begets, cheesecake, hot dogs, knishes, and delicatessens (or diets) to the city. Italian immigrants brought New York-style pizza and Italian cuisine into the city, white Jewish immigrants and Irish immigrants brought pastrami and corned beef, respectively. Chinese and other Asian restaurants, sandwich joints, diners, and coffee houses are ubiquitous throughout the city. Some 4,000 mobile food vendors. As of 2019, there were 27,043 restaurants in the city, up from 24,865 in 2017.

Problem:

Since the competition has been always on a rise in New York like every other business even the restaurant business also has many ups and down but in order to survive the wave we need an analysis of the supply of raw materials, different cuisines served the ratings of restaurants, demography of the area also need to understand the population and desires of people living in the neighbourhood so that we can establish a prosperous restaurant.

Target Audience:

One of my friend is planning to open a restaurant in new York , so he has asked me to help him understand the different aspects that are really crucial in terms of restaurant business .The complete analysis will help him understand how the different attributes plays their major role in helping a restaurant flourish, cuisine, location etc.

If anyone else who is planning to open a restaurant business in New York can also take a peek and help them with the relevant details.

Data Sources:

The City selected for the analysis is New York.

- **New York City Neighbourhood Dataset.**

  The City has a total of 5 boroughs and 306 neighbourhoods. In order to analysis the city we need to create a data frame that has boroughs and the relevant neighbourhood along with their latitude and longitude details.

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

- **DOHMH Farmers Markets and Food Boxes dataset.**

  This helps us understand the different farms details and their locations as well. It plays a very vital role as Restaurant Business always depend on the raw materials they require on a daily basis.

  This dataset exists for free on the web.

  https://data.cityofnewyork.us/dataset/DOHMH-Farmers-Markets-and-Food-Boxes/8vwk6iz2

- **1. New York Population**

- **2. New York City Demographics**

  If you are planning to open a new business you need to study the Population and the Demographics of the place because you should always know your targeted customers .
  If you know the people you are attracting that always help you save money on marketing.

  This dataset exists for free on the web.
  https://en.wikipedia.org/wiki/New_York_City
  https://en.wikipedia.org/wiki/Portal:New_York_City

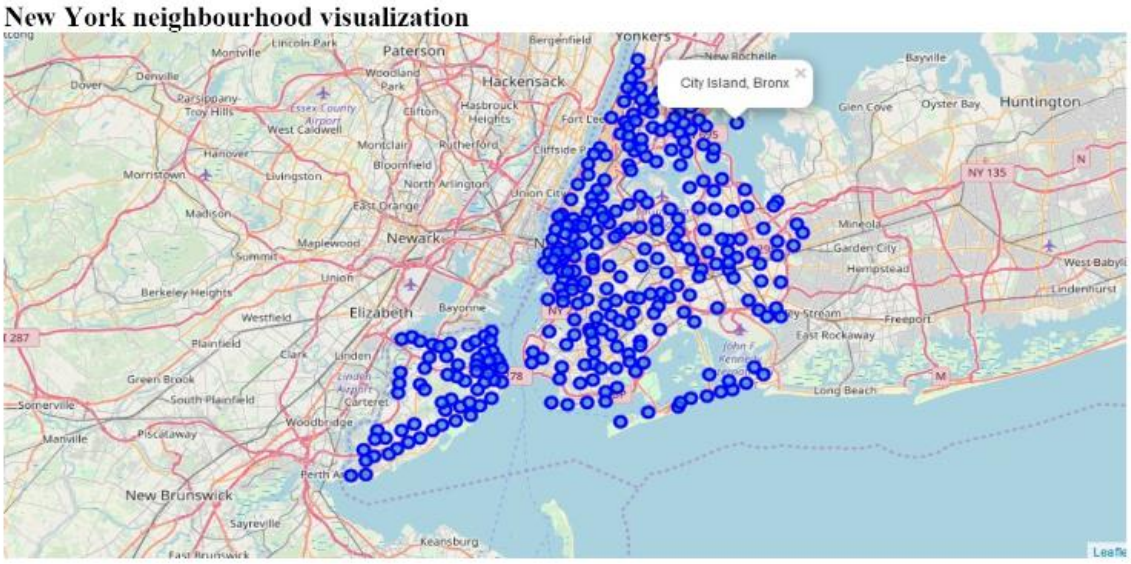
- **Foursquare API:**

  New York city geographical coordinates data will be utilized as input for the Foursquare API.
  We will use the Foursquare API to explore neighbourhoods in New York City.
  This will help us in segmenting the neighbourhoods and thus identifying the best options at hand to open up a new restaurant.

Data Cleansing:

The New York City Neighbourhood Dataset was a geojson file. Tis was converted to a data frame taking only the relevant parameters - Borough, Neighbourhood, Latitude and Longitude of the Neighbourhood. The file was then converted into a data frame using user defined functions.
The data was checked for any anomalies and data frame was checked for entries as well.

Methodology:

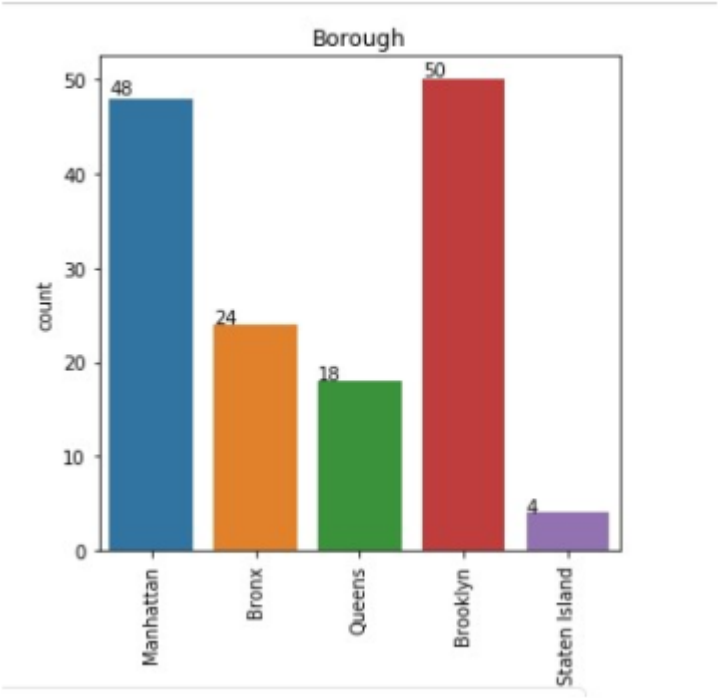


This data frame contains the geographical coordinates of New York city neighbourhoods. This data will used to get Venues data from Foursquare. We used geopy and folium libraries to create a map of New York city with neighbourhoods superimposed on top
After considering the neighbourhood the other details was also looked upon with great interest.

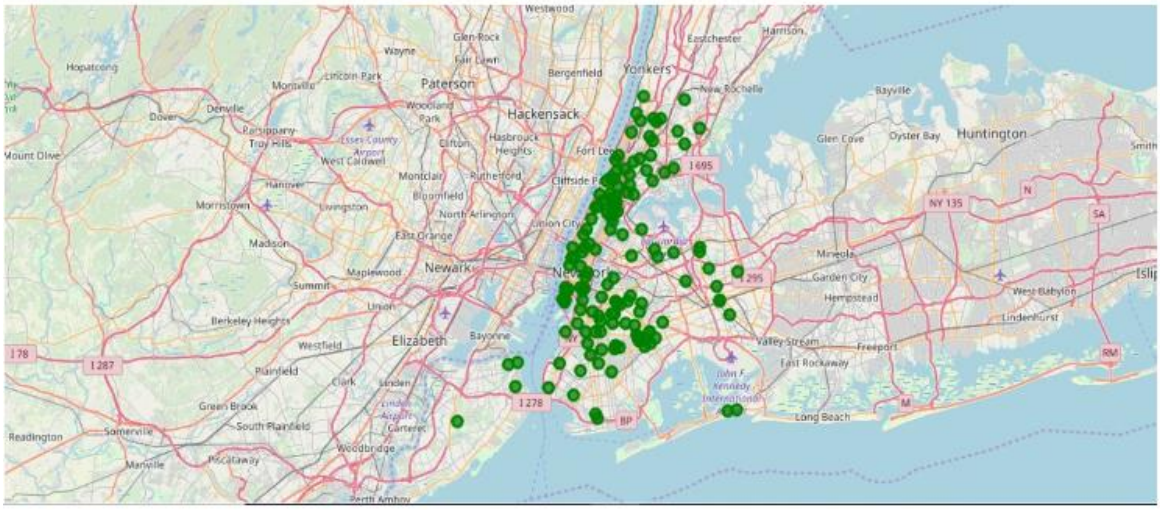
DOHMH Farmers Markets and Food Boxes dataset

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.

The complete study of which helped us in understanding that Manhattan and Brooklyn were the two cities where the number of farm markets are very high compared to the other.
Not only this We also used geopy and folium libraries to create a map to visualise farmers markets of New York city.
So that the analysis can be more clear.

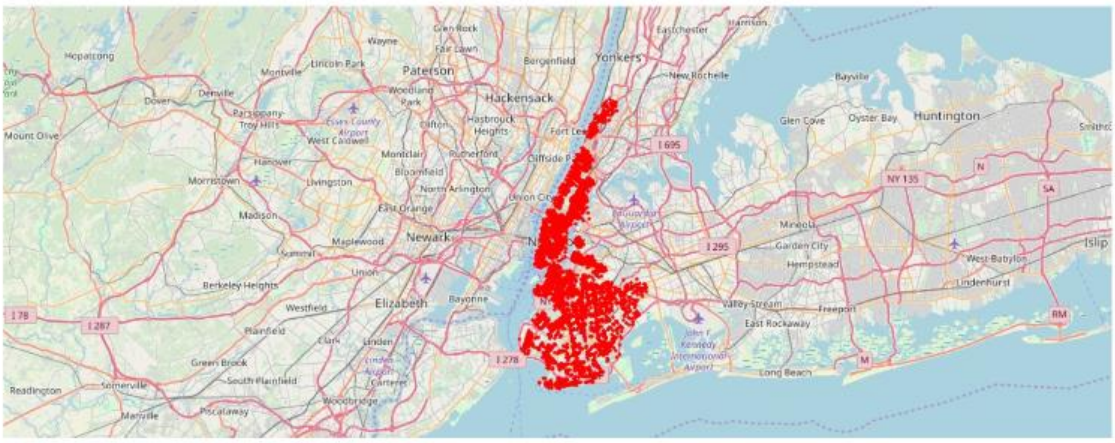


Farmers Market visualisation-New York City



New York city geographical coordinates data has been 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 neighbourhoods in New York City.

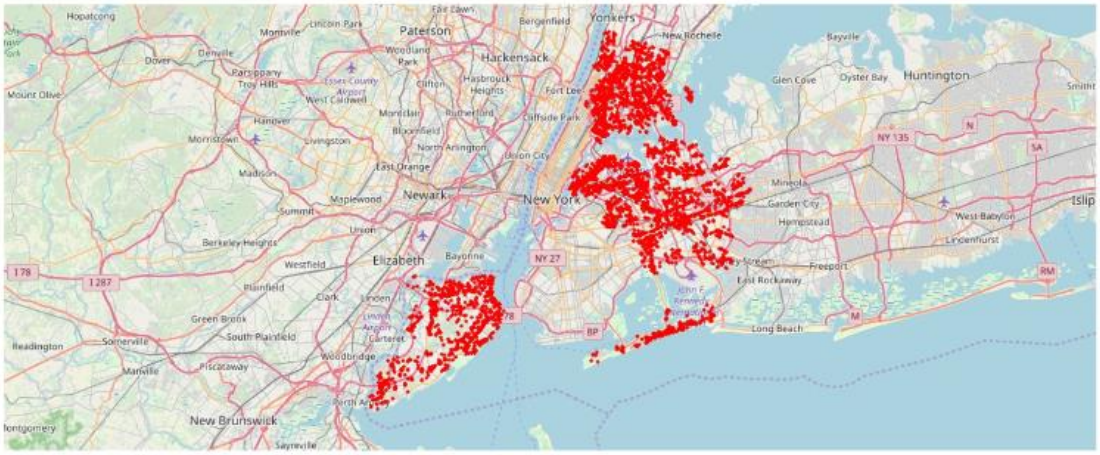
Brooklyn and Manhattan Venues Visualization : Generated the below Brooklyn and Manhattan Venues Visualization. The "BM_venues" dataframe has 9708 venues and 397 unique venue types.



Brooklyn and Manhattan Venues :

	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

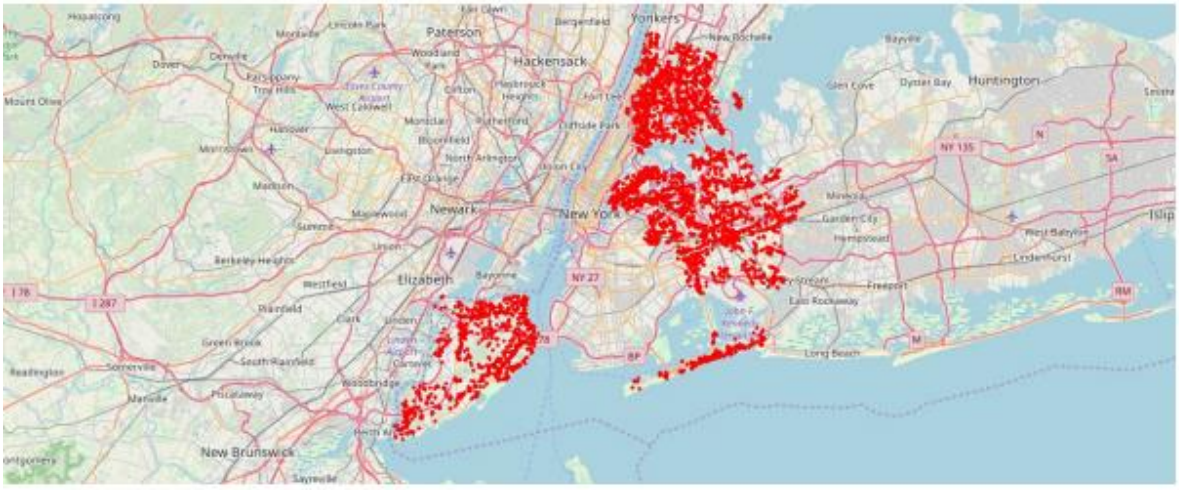
Bronx, Queens and Staten Island Venues Map Visualization :



Bronx, Queens and Staten Island Venues Visualization : The "BQS_venues" dataframe has 10805 venues and 387 unique venue types.

	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 Venues Map Visualization :

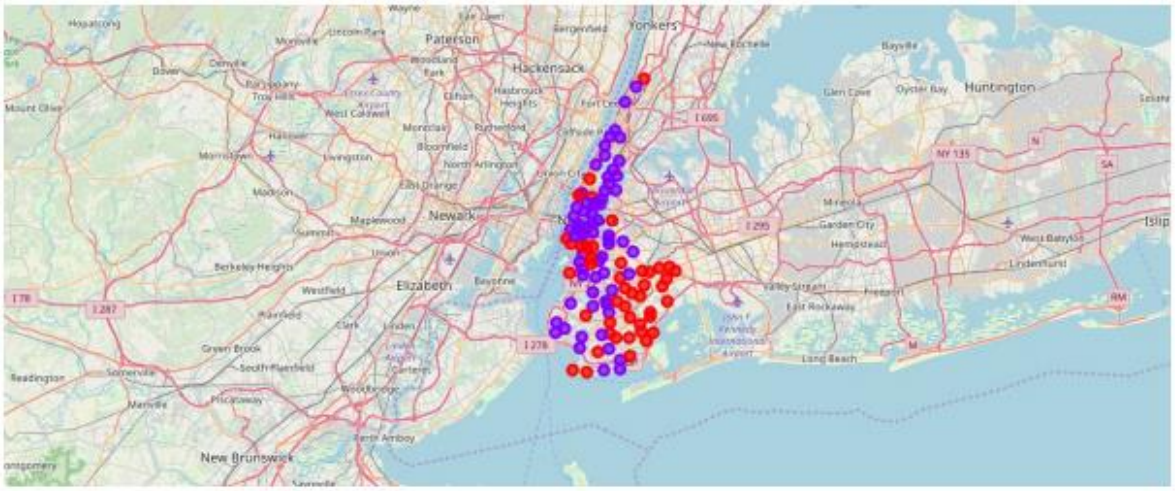


RESULTS:

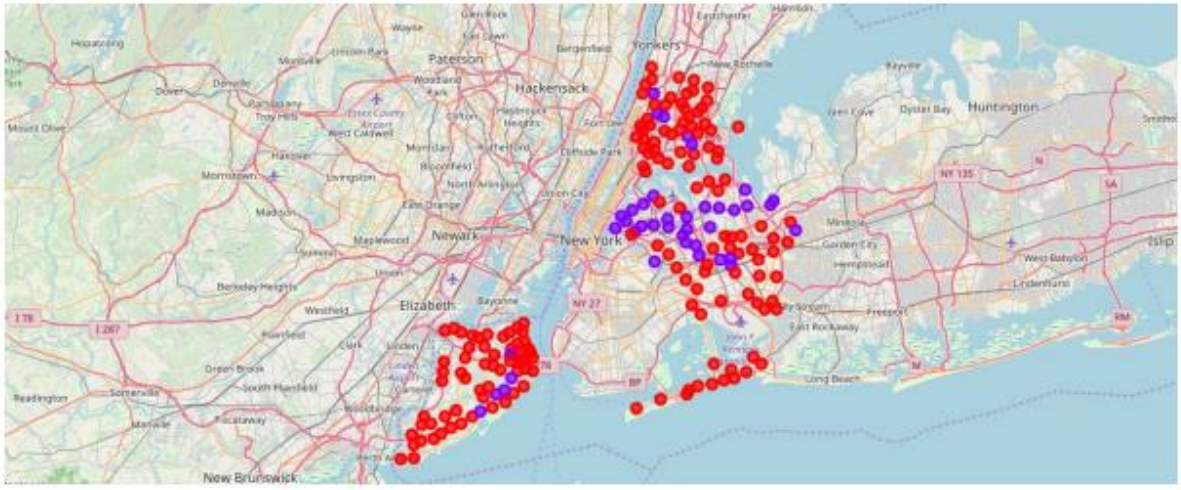
From the data we filtered and used only the restaurant data for Brooklyn & Manhattan clustering and Bronx, Queens and Staten Island clustering, As our main focus was on the restaurant business.

Neighbourhood K-Means clustering based on mean occurrence of venue category:

In the below Map Visualization, we can see the different types of clusters created by using K-Means for Brooklyn & Manhattan.



In the below Map Visualization, we can see the different types of clusters created by using K-Means for Bronx, Queens and Staten Island.



Cluster 0: The total of cluster0 is small values it signifies that the market is not saturated

Cluster1: The higher number of the total of cluster1 states that the concentration of the restaurants is higher.

Conclusion:

Even though the market of New York is very Saturated and competition is on a higher side still we have scope of being able to open Restaurant Business.

I would recommend Manhattan as it not only has good supply of raw materials but also the Restaurant business still has enough room for a new Business to be able to Survive well.