

The Battle of the Neighborhoods

Introduction/Business Problem

Problem Background

New York City, the most populated city in New York and the United States with a population of 17,990,455, lies at the end of the Hudson River on the southernmost tip of the state New York. It is a global hub of business and commerce. The city is a major center for banking and finance, retailing, world trade, transportation, tourism, real estate, new media, traditional media, advertising, legal services, accountancy, insurance, theater, fashion, and the arts in the United States.

The cost of living and the cost of opening a new business is always a key initial factor for any organization or entrepreneur. Thus if any new business venture or expansion is taking place, it needs to be analyzed very carefully. The analysis should provide the key factors that will drive the environment and health of any business

Problem Description

A Food Joint is one among those businesses which can grow in no time provided that the area market is first analyzed. A food Joint may include a restaurant, pub, cafe, parlors, etc. Considering a Businessman Mr. M wants to open an ITALIAN restaurant and he approaches a data scientist to analyze the factors that will play a key role in the development as well as growth. Since New York is already known for its excellent cuisines and Italian food culture, the following factors are very important to be analyzed:

- 1.The best possible location for the restaurant.
- 2.Which neighborhoods and boroughs of New York City have the most as well as the best Italian restaurants
- 3.Where would one go in New York City to have the best Italian food?

Data

The city which will be analyzed thoroughly: New York City

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

Links to the datasets:

https://cocl.us/new_york_dataset

```
ny_data = get_new_york_data()
ny_data.head(10)
```

	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
5	Bronx	Kingsbridge	40.881687	-73.902818
6	Manhattan	Marble Hill	40.876551	-73.910660
7	Bronx	Woodlawn	40.898273	-73.867315
8	Bronx	Norwood	40.877224	-73.879391
9	Bronx	Williamsbridge	40.881039	-73.857446

<https://data.cityofnewyork.us/City-Government/Borough-Boundaries/tqmj-j8zm>

Using Foursquare API to get the list of restaurants:

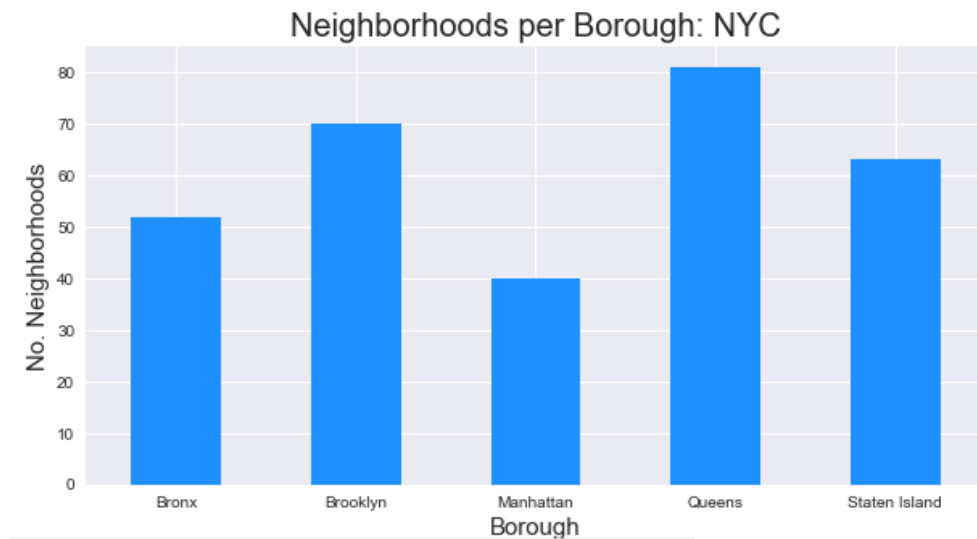
```
( 1 / 306 ) Italian Resturants in Wakefield, Bronx:0
['Bronx', 'Wakefield', 40.89470517661, -73.84720052054902]
( 2 / 306 ) Italian Resturants in Co-op City, Bronx:0
['Bronx', 'Co-op City', 40.87429419303012, -73.82993910812398]
( 3 / 306 ) Italian Resturants in Eastchester, Bronx:0
['Bronx', 'Eastchester', 40.887555677350775, -73.82780644716412]
( 4 / 306 ) Italian Resturants in Fieldston, Bronx:0
['Bronx', 'Fieldston', 40.89543742690383, -73.90564259591682]
( 5 / 306 ) Italian Resturants in Riverdale, Bronx:0
['Bronx', 'Riverdale', 40.890834493891305, -73.9125854610857]
( 6 / 306 ) Italian Resturants in Kingsbridge, Bronx:0
['Bronx', 'Kingsbridge', 40.88168737120521, -73.90281798724604]
( 7 / 306 ) Italian Resturants in Marble Hill, Manhattan:0
['Manhattan', 'Marble Hill', 40.87655077879964, -73.91065965862981]
( 8 / 306 ) Italian Resturants in Woodlawn, Bronx:1
['Bronx', 'Woodlawn', 40.89827261213805, -73.86731496814176]
( 9 / 306 ) Italian Resturants in Norwood, Bronx:0
['Bronx', 'Norwood', 40.87722415599446, -73.8793907395681]
( 10 / 306 ) Italian Resturants in Williamsbridge, Bronx:0
['Bronx', 'Williamsbridge', 40.88103987818311, -73.85744642074207]
```

Methodology

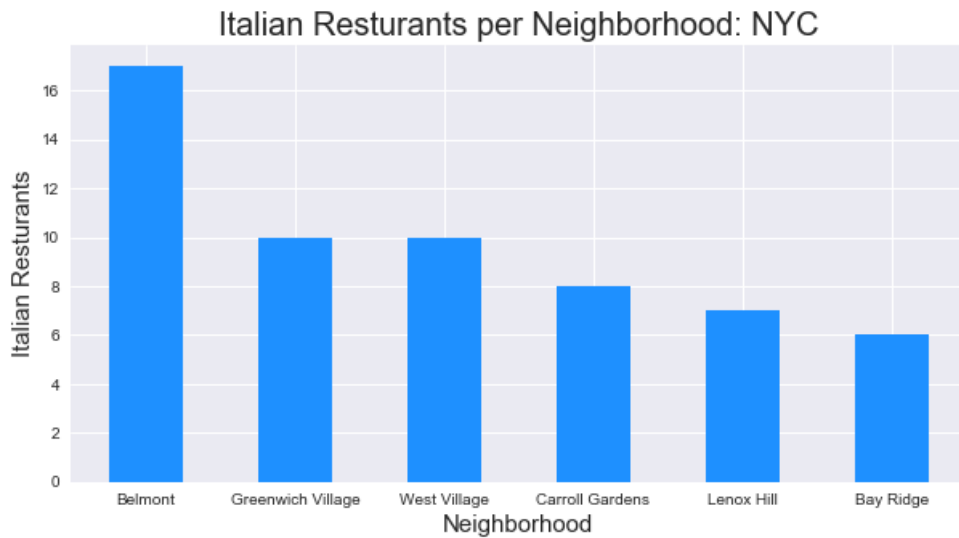
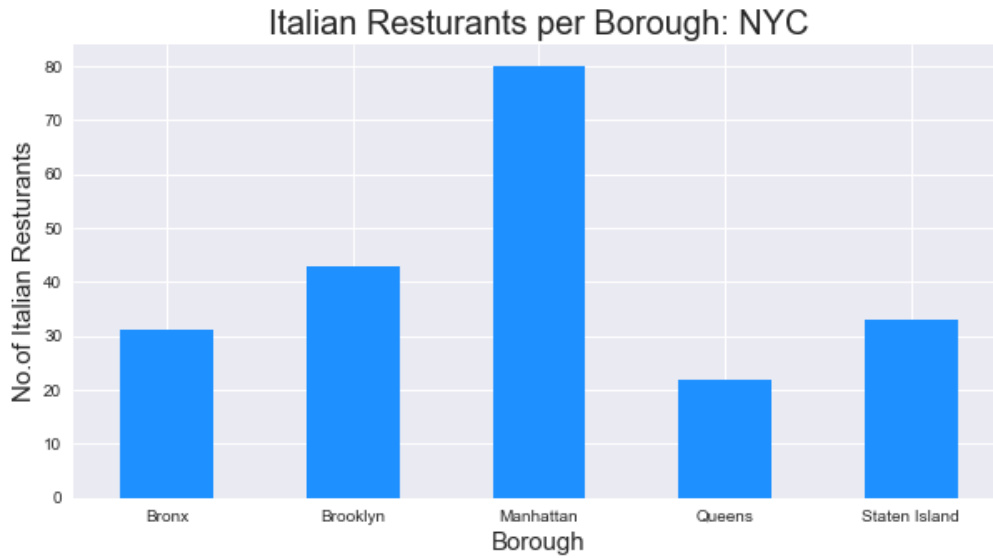
- Data will be collected from https://cocl.us/new_york_dataset and cleaned and processed into a data frame.
- Foursquare be used to locate all venues and then filtered by Italian restaurants. Ratings, tips, and likes by users will be counted and added to the data frame.
- Data will be sorted based on rankings
- Finally, the data be will be visually assessed using graphing from various Python libraries

Exploratory Data Analysis and Visualization

- Number of Neighborhoods per borough was plotted initially from the New York Data.



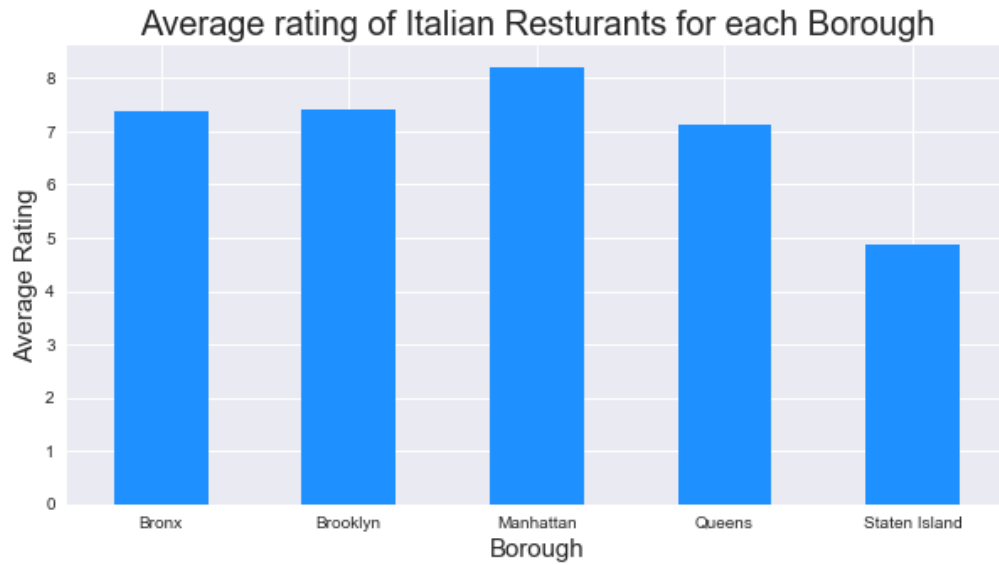
- To understand the competition level in terms of number of restaurants the following graph was plotted.



- After getting the details such as which borough has more restaurants and which one has less, it was time further to dig into the quality of food served by the restaurants. To be more precise now the ratings and reviews of the Italian restaurants was to be unearthed. Which area has the best average rated restaurants and which has the least. Basically which place has received more likes and better reviews by the customers.

	Neighborhood	Average Rating
12	Bushwick	9.500
11	Boerum Hill	9.100
53	Little Italy	9.000
45	Hamilton Heights	9.000
87	Tribeca	8.900
44	Greenwich Village	8.860
81	Soho	8.850
68	North Side	8.800
66	Noho	8.725
24	Corona	8.700

	Borough	Average Rating
2	Manhattan	8.201250
1	Brooklyn	7.404651
0	Bronx	7.364516
3	Queens	7.127273
4	Staten Island	4.857576



	Borough	Neighborhood	Latitude	Longitude	Average Rating
0	Queens	Auburndale	40.761730	-73.791762	8.200000
1	Brooklyn	Boerum Hill	40.685683	-73.983748	9.100000
2	Brooklyn	Bushwick	40.698116	-73.925258	9.500000
3	Manhattan	Carnegie Hill	40.782683	-73.953256	8.500000
4	Bronx	City Island	40.847247	-73.786488	8.300000
5	Brooklyn	Clinton Hill	40.693229	-73.967843	8.650000
6	Brooklyn	Cobble Hill	40.687920	-73.998561	8.366667
7	Queens	Corona	40.742382	-73.856825	8.700000
8	Brooklyn	Dumbo	40.703176	-73.988753	8.100000
9	Manhattan	East Village	40.727847	-73.982226	8.600000
10	Manhattan	Financial District	40.707107	-74.010665	8.200000
11	Manhattan	Flatiron	40.739673	-73.990947	8.500000
12	Brooklyn	Fort Greene	40.688527	-73.972906	8.466667
13	Brooklyn	Fulton Ferry	40.703281	-73.995508	8.100000
14	Manhattan	Gramercy	40.737210	-73.981376	8.100000
15	Staten Island	Grasmere	40.598268	-74.076674	8.300000

Result

- From the graph plotted above for No of Italian Restaurants per Borough we can conclude **Manhattan** has the highest whereas **Queens** has the lowest number of Italian Restaurants.
- **Brooklyn, Bronx** and **Staten Island** have approx. half the number of Italian Restaurants when compared to **Manhattan** wherein **Bronx** has the lowest case.
- From the Average Ratings data frame created above we can conclude that **Manhattan** and **Queens** have the best rated Italian restaurants on average.
- Belmont of The Bronx is the neighborhood in all of NYC with the most Italian Restaurants

Conclusion

Despite Manhattan having the least number of neighborhoods in all five boroughs, it has the most Italian restaurants. Based on this information, I would state that **Manhattan** and **Queens** are the best locations for Italian Restaurant in NYC. **Queens** has multiple neighborhoods with average ratings exceeding 8.0 of a scale of 1.0 to 10.0 and has the least number of Italian restaurants making competition easier than in other boroughs.