

Intro

This final project explores the best locations to put Indian restaurants throughout New York. New York is one of the most famous cities in the world and is an iconic city in the United States. This city has 8.4 million people(United States Census) and is an area that contains a plethora of communities, ethnicities, and cultures. Indian restaurants started opening around the 1900s in New York so these cuisines have been in New York for a long time. As an Indian American, I would like to explore Indian restaurant locations throughout New York and where new ones should open for the best business. I will attempt to answer the question "Where should I open an Indian restaurant?" by using factors that could influence the competition of the restaurant.

Data

To find out the answers about these Indian restaurants and where to open new ones, there is a lot of data needed about New York including data on New York City neighborhoods, boroughs to include boundaries, latitude, longitude, restaurants, and restaurant ratings and tips are required.

New York City data containing the neighborhoods and boroughs, latitudes, and longitudes will be obtained from the data source: https://cocl.us/new_york_dataset

New York City data containing neighborhood boundaries will be obtained from the data source: <https://data.cityofnewyork.us/City-Government/Borough-Boundaries/tqmj-j8zm>

All data related to locations and quality of Indian restaurants will be obtained via the FourSquare API utilized via the Request library in Python.

We will be using this data to determine which neighborhoods have a lot of indian restaurants of higher or lower ratings. Using this we can determine and map out which neighborhoods can be most profitable and suitable for someone attempting a new Indian restaurant.

Methodology

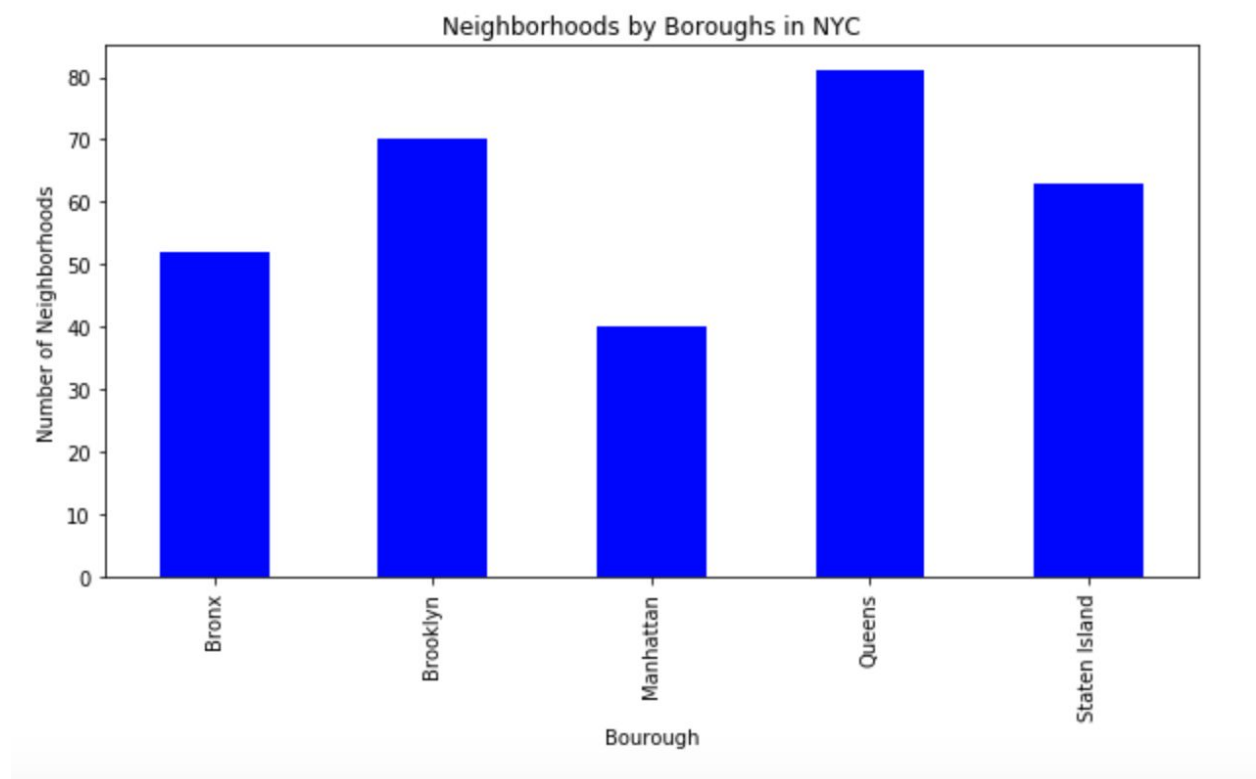
First, I collected, cleaned, and processed the data from https://cocl.us/new_york_dataset to put it into a dataframe. I then used FourSquare to locate all the Indian Restaurants in New York. I then made a dataframe to collect all the data from FourSquare regarding the Indian Restaurants. This data had information about restaurants including how many Indian restaurants there were in each neighborhood, and borough. Additional information included each restaurant's ID, name, and which borough and neighborhood it belonged to.

However, this dataframe did not have any data about the ratings, likes, and tips about each Indian restaurant. So I had to create a new dataframe with the rest of statistics about these restaurants. Using FourSquare again I populated this data frame with the ratings, likes, and tips of each restaurant in addition to the borough and neighborhood they are located in.

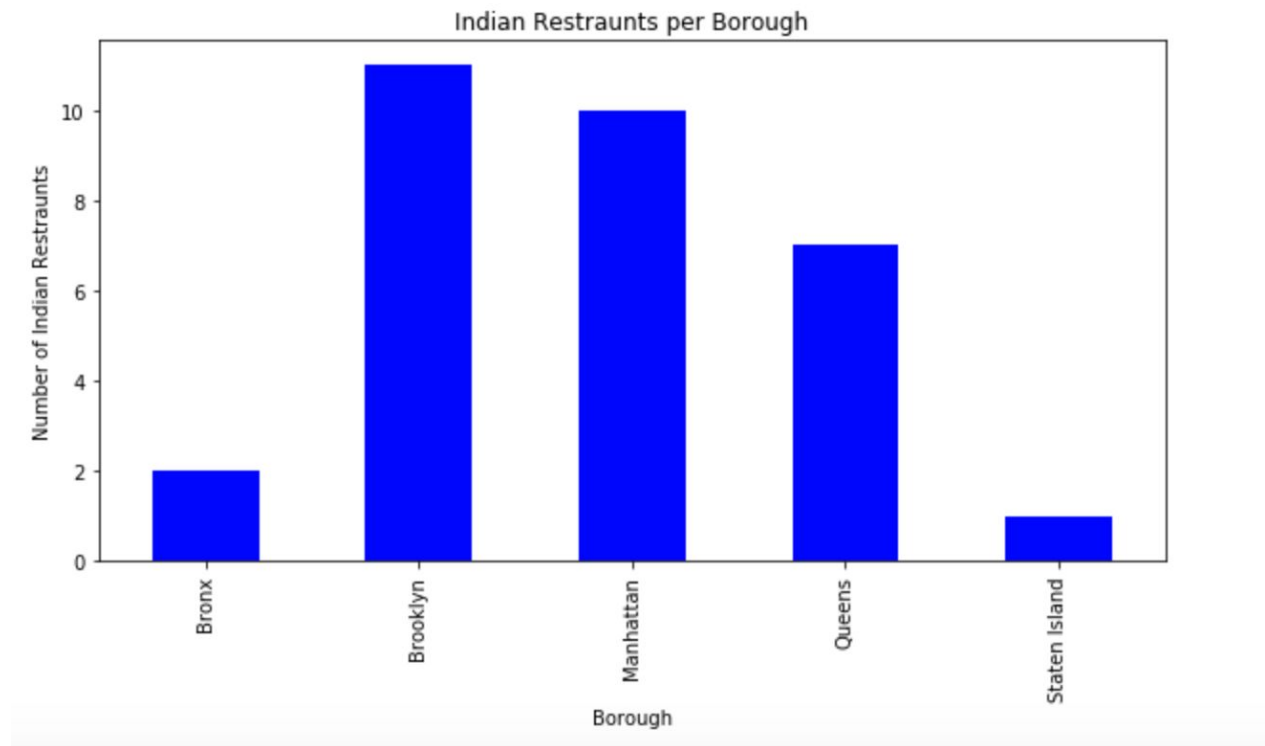
Using this data I was able to find the average ratings of the restaurants in specific neighborhoods and boroughs which will help us decide where to locate a new restaurant later on.

Results

First when I had the data about the neighborhoods and boroughs I wanted to see the amount of neighborhoods the boroughs had. I thought that this would possibly help me decide which borough I would open a new Indian restaurant at. The results are below.

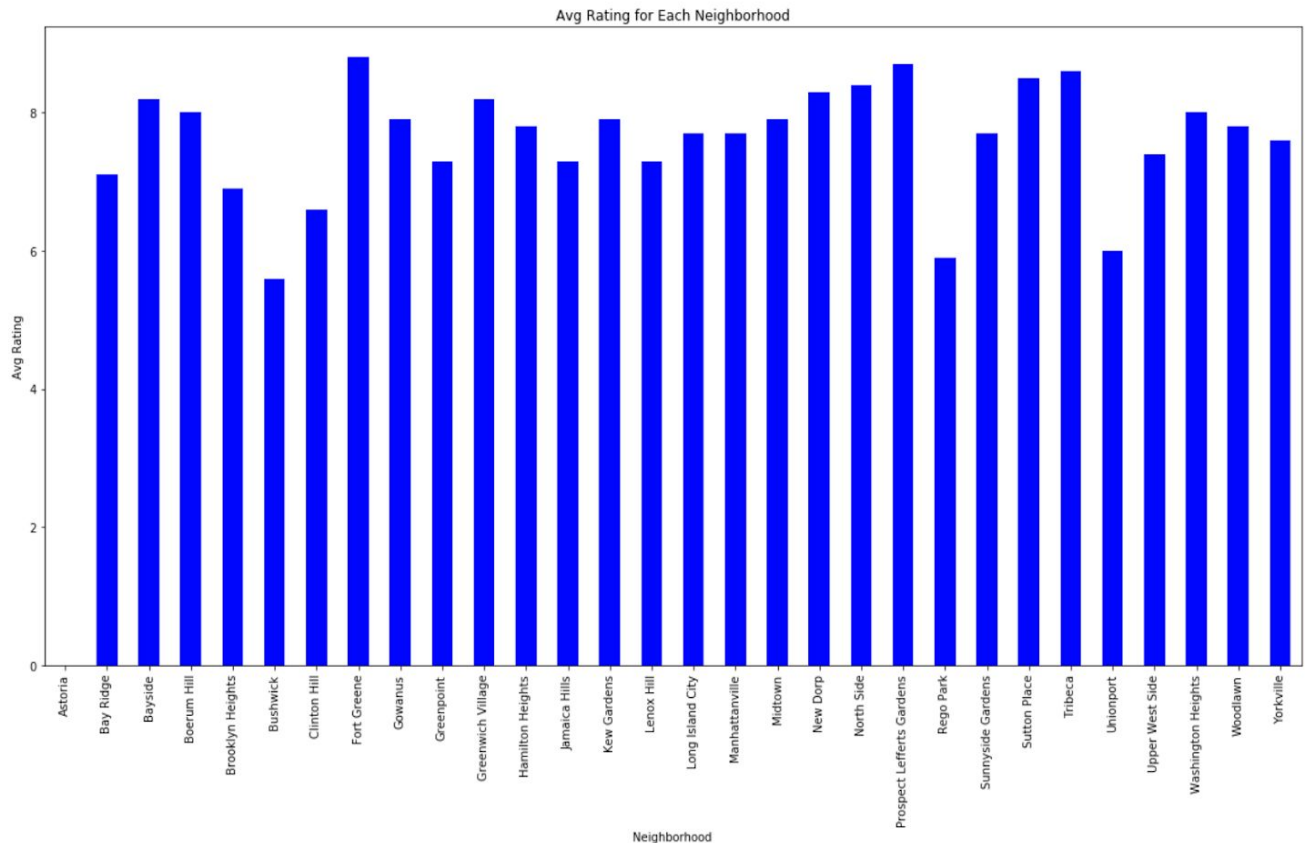


As the data show, Manhattan has the least number of neighborhoods of the boroughs. The order from least number of neighborhoods to most goes as follows: 1) Manhattan 2) Bronx 3) Staten Island 4) Brooklyn 5) Queens. However, I decided to graph how many indian restaurants there were in each Borough by using FourSquare data. The results are below.



This data is interesting because it contradicts the thinking I had based on the previous data. Based on the previous graph I thought a restaurant would probably be located in Manhattan as it had the lowest number of neighborhoods. However, the data on FourSquare shows that even though Manhattan had the least number of Indian Restaurants it actually has the most indian restaurants of all the boroughs. The boroughs with the least amount of indian restaurants are the Bronx, Staten Island, and Queens.

So using this data I had a vague idea of which broughs had the most indian restaurants in order to avoid competition that might take away some of the business and customers. Next, I wanted to look into the likes, ratings, and tips to see which neighborhoods and boroughs had the best ratings. I graphed the average rating in each neighborhood which is shown below.

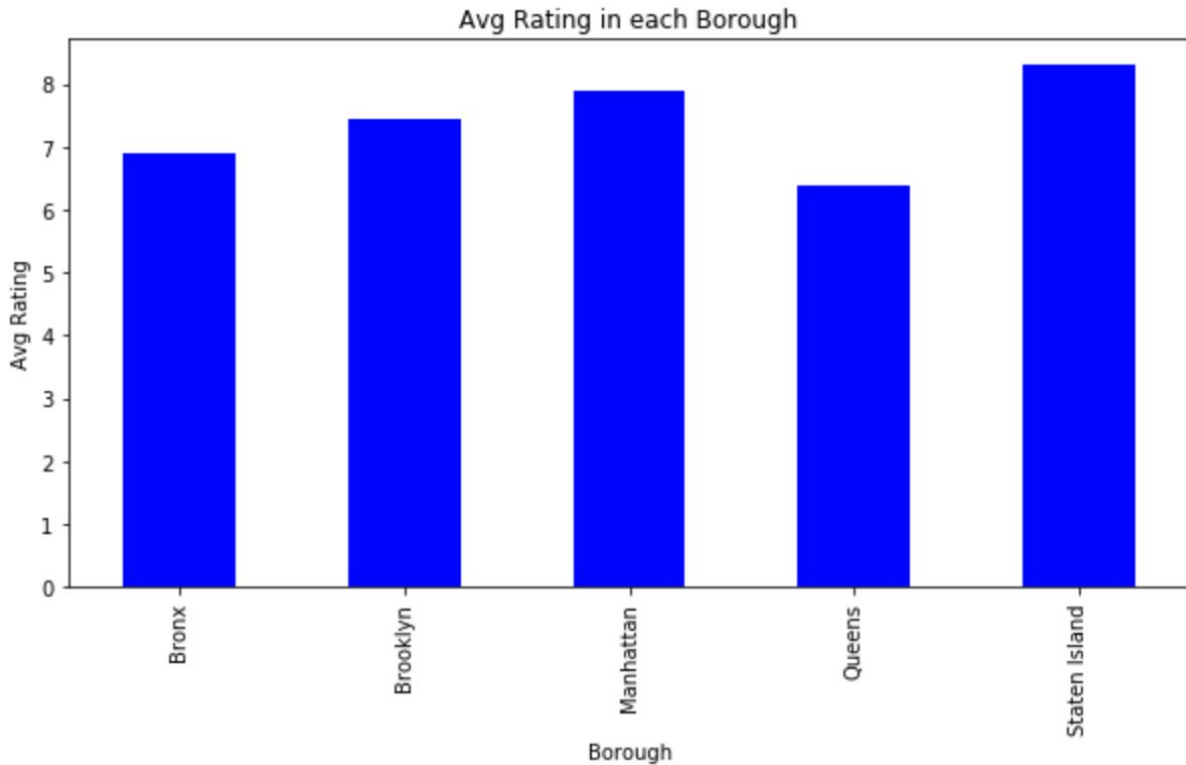


This shows which neighborhoods to avoid if possible. It won't be very smart to put an indian restaurant at a location where there are other restaurants with high ratings. I then wanted to see which borough I should put a new restaurant. We already have an idea which boroughs have a high number of restaurants and the average rating of these restaurants will be very helpful. Below are the average ratings of each Borough.

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	Borough	Avg Rating
3	Queens	6.385714
0	Bronx	6.900000
1	Brooklyn	7.445455
2	Manhattan	7.900000
4	Staten Island	8.300000

And then I wanted to graph the data as shown below.



This graph showed the average rating in each borough. We can see that Queens and the Bronx have the lowest ratings of all the boroughs in NYC. Below we can see the number of indian restaurants in each of these boroughs.

Queens:

	Borough	Neighborhood	ID	Name	Likes	Rating	Tips
22	Queens	Astoria	0	0	0.0	0.0	0.0
23	Queens	Kew Gardens	5782c9ce498edde587f5aa14	Tikka Indian Grill	10.0	7.9	2.0
24	Queens	Long Island City	50a287a7e4b0033f830f06db	Raj's Indian Kitchen	25.0	7.7	13.0
25	Queens	Rego Park	4b3a8aa5f964a520996925e3	Sajni 026	3.0	5.9	6.0
26	Queens	Bayside	4f1f4996e4b01ff351a7a50c	Ayna Agra Indian Restaurant	38.0	8.2	12.0
28	Queens	Jamaica Hills	4c434b2bd691c9b6ef8f8f0a	Sagar Restaurant	10.0	7.3	6.0
30	Queens	Sunnyside Gardens	4c48da9f3013a59356c5f0e1	Saffron Garden	17.0	7.7	16.0

Bronx:

	Borough	Neighborhood	ID	Name	Likes	Rating	Tips
0	Bronx	Woodlawn	4c0448d9310fc9b6bf1dc761	Curry Spot	5.0	7.8	10.0
1	Bronx	Unionport	4c194631838020a13e78e561	Melanies Roti Bar And Grill	3.0	6.0	2.0

As we can see Queens has seven Indian restaurants while the Bronx only has two Indian restaurants. As seen in the graph above regarding the number of Indian restaurants in each Borough, Staten Island was one of the lowest ones so we can see that restaurant's rating, tips, and likes below.

	Borough	Neighborhood	ID	Name	Likes	Rating	Tips
27	Staten Island	New Dorp	4be74a502468c928505a0243	Taste Of India II	29.0	8.3	14.0

Using these graphs and data, the optimal place to put a new Indian restaurant would be in the Bronx, or in Staten Island but a different Neighborhood.

Conclusion

According to the data, I think the best place to put a new Indian restaurant would be in the Bronx. The Bronx only has two indian restaurants in the borough and the ratings for both these restaurants are 6.0 and 7.8. These ratings are not great so this shows the customers enjoy the food but it is not the best of the indian restaurants. To me, putting a new indian restaurant in the Bronx would be a great idea. There are 50+ neighborhoods in the Bronx and two mediocre indian restaurants. This minimizes competition for customers and provides a great opportunity to make money.

A second option that would be a good place to put a new Indian restaurant would be on Staten Island but in a different Neighborhood than New Dorp. Unlike the restaurants in the Bronx, the indian restaurant in New Dorp has an excellent rating at 8.3. So I would put an indian restaurant on Staten Island but avoid New Dorp or neighborhoods near there because it has a good indian restaurant. This minimizes the competition with *Taste of India 2* but maximizes the potential customers you can have because Staten Island has the third highest neighborhoods of all the NYC boroughs.

This is only a preliminary study and to decide a more accurate location you could get more information regarding demographics and salaries to make a more accurate prediction.