

Capstone Assignment

Battle of the Neighborhoods Week 2

Introduction

New York City's demographics show that it is a large and ethnically diverse metropolis. It is the largest city in the United States with a long history of international immigration. New York City was home to nearly 8.5 million people in 2014, accounting for over 40% of the population of New York State and a slightly lower percentage of the New York metropolitan area, home to approximately 23.6 million. Over the last decade the city has been growing faster than the region. The New York region continues to be by far the leading metropolitan gateway for legal immigrants admitted into the United States.

Throughout its history, New York City has been a major point of entry for immigrants; the term "melting pot" was coined to describe densely populated immigrant neighborhoods on the Lower East Side. As many as 800 languages are spoken in New York, making it the most linguistically diverse city in the world. English remains the most widely spoken language, although there are areas in the outer boroughs in which up to 25% of people speak English as an alternate language, and/or have limited or no English language fluency. English is least spoken in neighborhoods such as Flushing, Sunset Park, and Corona.

With its diverse culture, comes diverse food items. There are many restaurants in New York City, each belonging to different categories like Chinese, Indian, French etc.

So as part of this project, we will list and visualize all major parts of New York City that has great Indian restaurants.

Data

Data For this project we need the following data :

New York City data that contains list Boroughs, Neighborhoods along with their latitude and longitude. Data source : https://cocl.us/new_york_dataset Description : This data set contains the required information. And we will use this data set to explore various neighborhoods of New York city. Indian restaurants in each neighborhood of New York city. Data source: Foursquare API Description: By using this API we will get all the venues in each neighborhood. We can filter these venues to get only indian restaurants. GeoSpace Data source: <https://data.cityofnewyork.us/City-Government/Borough-Boundaries/tgmi-j8zm> Description : By using this geo space data we will get the New York Borough boundaries that will help us visualize choropleth map.

Approach

- Collect the New York city data from https://cocl.us/new_york_dataset
- Using Foursquare API we will find all venues for each neighborhood.
- Filter out all venues that are Indian Restaurants.

- Find rating, tips and like count for each Indian Restaurants using FourSquare API.
- Using rating for each restaurant, we will sort that data.
- Visualize the Ranking of neighborhoods using folium library(python)

Queries that can be answered using above dataset

- What is best location in New York City for Indian Cuisine?
- Which areas have potential Indian Restaurant Market?
- Which all areas lack Indian Restaurants?
- Which is the best place to stay if I prefer Indian Cuisine?

Analysis

Required Libraries

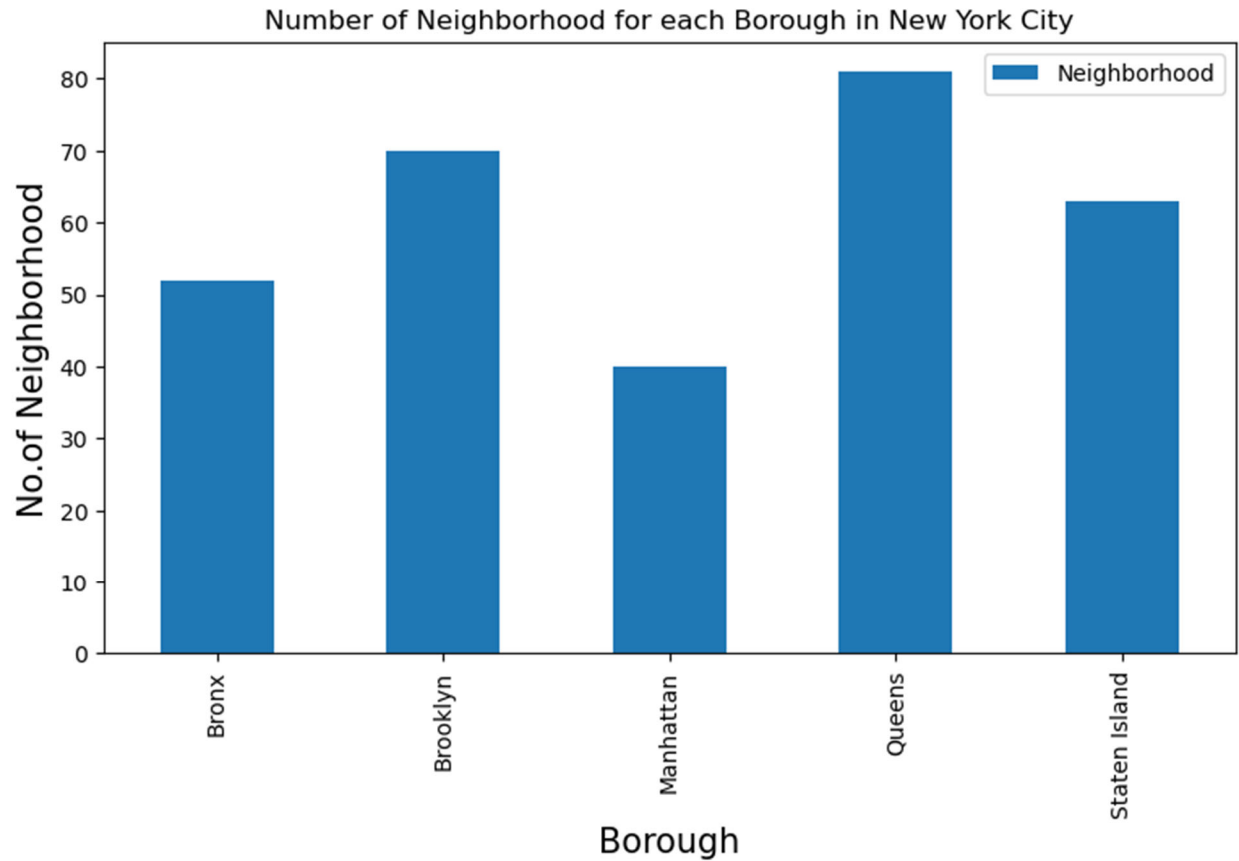
- pandas and numpy for handling data.
- request module for using FourSquare API.
- geopy to get co-ordinates of City of New York.
- folium to visualize the results on a map

	B o r o u g h	N e i g h b o r h o o d	L a t i t u d e	L o n g i t u d e
0	B r o	W a k	4 0 .	- 7 3

	B o r o u g h	N e i g h b o r h o o d	L a t i t u d e	L o n g i t u d e
	n x	e fi e l d	8 9 4 7 0 5	. 8 4 7 2 0 1
1	B r o n x	C o - o p C it y	4 0 . 8 7 4 2 9 4	- 7 3 . 8 2 9 9 3 9
2	B r o n x	E a st c h e st e r	4 0 . 8 8 7 5 5 6	- 7 3 . 8 2 7 8

	B o r o u g h	N e i g h b o r h o o d	L a t i t u d e	L o n g i t u d e
				0 6
3	B r o n x	F i e l d s t o n	4 0 . 8 9 5 4 3 7	- 7 3 . 9 0 5 6 4 3
4	B r o n x	R i v e r d a l e	4 0 . 8 9 0 8 3 4	- 7 3 . 9 1 2 5 8 5

So there are total of 306 different Neighborhoods in New York



We see that Queens has highest number of neighborhoods. Now we will collect Indian restaurants for each Neighborhood

	Borough	Neighborhood	ID	Name
0	Brooklyn	Wood	4c0448d9310f	Curry

	B o r o u g h	N e i g h b o r h o o d	ID	N a m e
	n x	l a w n	c9b6bf 1dc761	y S p o t
1	B r o n x	P a r k c h e s t e r	4c1946 31838 020a13 e78e56 1	M e l a n i e s R o t i B a r A n d G r i l l

	Borough	Neighborhood	ID	Name
2	Bronx	Spuyten Duyvil	4c0454 4df423 a593ac 83d116	Cumin Indian Cuisine
3	Bronx	Concourse	551b7f 75498e 86c00a 0ed2e1	Hungry Bird

	Borough	Neighborhood	ID	Name
4	Bronx	Unionport	4c194631838020a13e78e561	Melanie Roti Bar And Grill



We see that Queens has the largest number of Indian restaurants



	Borough	Neighborhood	ID	Name
103	Quee	Flor	4e4e3e22bd4101d	Kera

	Borough	Neighborhood	ID	Name
	ns	al Park	0d7a5c2d1	l a K i t c h e n
104	Queens	Floral Park	4b647b56f964a520c4b62ae3	U s h a F o o d s & U s h a S w e e t s

	Borough	Neighborhood	ID	Name
105	Queens	Floral Park	527ffc 0811d 2d329 d5e49 abd	Jackson Diner
106	Queens	Floral Park	4b787 c49f9 64a52 09cd1 2ee3	Santor Indian Rest

	Borough	Neighborhood	ID	Name
				aurant
107	Queens	Floral Park	4c0c01e0bbc676b00d6b4cd5	Mumbai Express
108	Queens	Floral Park	4c76ff35a5676dcb72671721	Flavor Of I

	Borough	Neighborhood	ID	Name
		rk		ndia
109	Queens	Floral Park	4df0f3 9dd4c 04d03 92c85 3ea	Sagar Chinesse
110	Queens	Floral Park	571af 96a49 8e9e3 92d8d 3786	Namaste Auth

	Borough	Neighborhood	ID	Name
				enric Indian Cuisine
111	Queens	Floral Park	55d68c1b498ecf05fa196fe1	Namaste Resta

	Borough	Neighborhood	ID	Name
				urant and Cafe
112	Queens	Floral Park	4c3e17f2ca012d7f82022fbe	Mushin's Halal Food

	B o r o u g h	N e i g h b o r h o o d	ID	N a m e
				[G y r o C a r t]
1 1 3	Q u e e n s	F l o r a l P a r k	4e6bf e1c7d 8b2c7 11b17 bbe5	S u r y a s w e e t s a n d s n a c

	Borough	Neighborhood	ID	Name
				ks

So Floral Park in Queens has the highest number of Indian Resturants with a total count of 9.

	Borough	Neighborhood	ID	Name			
	Bronx	Woodlawn	4c0448d9310	CurrySpot			

	B o r o u g h	N e i g h b o r h o o d	I D	N a m e			
			f c 9 b 6 b f l d c 7 6 1				
	B r o n x	P a r k c h e s t e r	4 c 1 9 4 6 3 1 8 3 8 0 2 0 a 1	N e l a n i e s R o t t i E a r A			

	B o r o u g h	N e i g h b o r h o o d	I D	N a m e			
			3 e 7 8 e 5 6 1	n d C r i l l			
	B r o n x	S p u y t e n D u y v i l	4 c 0 4 5 4 4 d f 4 2 3 a 5 9 3 a c 8 3 d	C u n i n I n d i a n C u i s i n e			

	Borough	Neighborhood	ID	Name			
			116				
	Erinx	Concourse	551b7f75498e86c00a0e d2e1	Hungry Bird			

	Borough	Neighborhood	ID	Name			
	Brooklyn	Unionport	4c194631838020a13e78e561	Nellies Root Beer And Grill			

In [26]:

So we got data for all restaurants Now let's save this data to a csv sheet. In case we by mistake modify it. As the number of calls to get details for venue are premium call and have limit of 500 per day, we will refer to saved data sheet csv if required

In [28]:

Lets verify the data from saved csv file

	B o r o u g h	N e i g h b o r h o o d	I D	N a m e			
	B r o n x	W o o d l a w n	4 c 0 4 4 8 d 9 3 1 0 f c 9 b 6 b f 1 d c 7 6 1	C u r r y S p o t			
	B r o	P a r k	4 c 1 9	N e l a			

	Borough	Neighborhood	ID	Name			
	Manhattan	Chester	4631838020a13e78e561	Charles Rottlieb			
	Brooklyn	Spuytenduck	4c04544df	Cumini Indri			

	Borough	Neighborhood	ID	Name			
		Yvill	423a593ac83d116	an C u i s i n e			
	Bronx	Concourse	551b7f75498e86	F u n g r y E i r d			

	B o r o u g h	N e i g h b o r h o o d	I D	N a m e			
			c 0 0 a 0 e d 2 e 1				
	B r o n x	U n i o n p o r t	4 c 1 9 4 6 3 1 8 3 8 0 2 0 a 1 3 e 7	N e l a n i e s R o t i E a r A n d C			

	Borough	Neighborhood	ID	Name	Likes	Rating	Tips
			8e561	ri11			

Data columns (total 7 columns):

```

Borough      50 non-null object
Neighborhood  50 non-null object
ID           50 non-null object
Name         50 non-null object
Likes        50 non-null object
Rating       50 non-null float64
Tips         50 non-null object

```

We see that values like Likes, Tips are strig values. We would need to convert them into float for further analysis

Data columns (total 7 columns):

```

Borough      50 non-null object
Neighborhood  50 non-null object
ID           50 non-null object
Name         50 non-null object
Likes        50 non-null float64
Rating       50 non-null float64
Tips         50 non-null float64

```

Now the data types looks correct

```

Borough      Manhattan
Neighborhood  Midtown
ID           49d91c12f964a520015e1fe3
Name         The Kati Roll Company
Likes        836
Rating       8.8

```

Tips 259
 Name: 41, dtype: object
 Borough Manhattan
 Neighborhood Tribeca
 ID 4bbb9dbded7776b0e1ad3e51
 Name Tamarind TriBeCa
 Likes 586
 Rating 9
 Tips 145
 Name: 45, dtype: object
 Borough Manhattan
 Neighborhood Midtown
 ID 49d91c12f964a520015e1fe3
 Name The Kati Roll Company
 Likes 836
 Rating 8.8
 Tips 259
 Name: 41, dtype: object

	Neighborhood	Average Rating
28	Tribeca	9.00
13	Greenwich Village	8.90
32	West Village	8.85
18	Midtown	8.80
3	Chelsea	8.80
19	Murray Hill	8.70

	Neighborhood	Average Rating
10	Fort Greene	8.60
20	North Side	8.60
26	South Side	8.60
25	Roosevelt Island	8.40

Above are the top neighborhoods with top average rating of Indian restaurant

In [41]:

	Borough	Average Rating
2	Manhattan	8.227273
1	Brooklyn	7.408696
0	Bronx	6.620000

Similarly these are the average rating of Indian Restaurants for each Borough

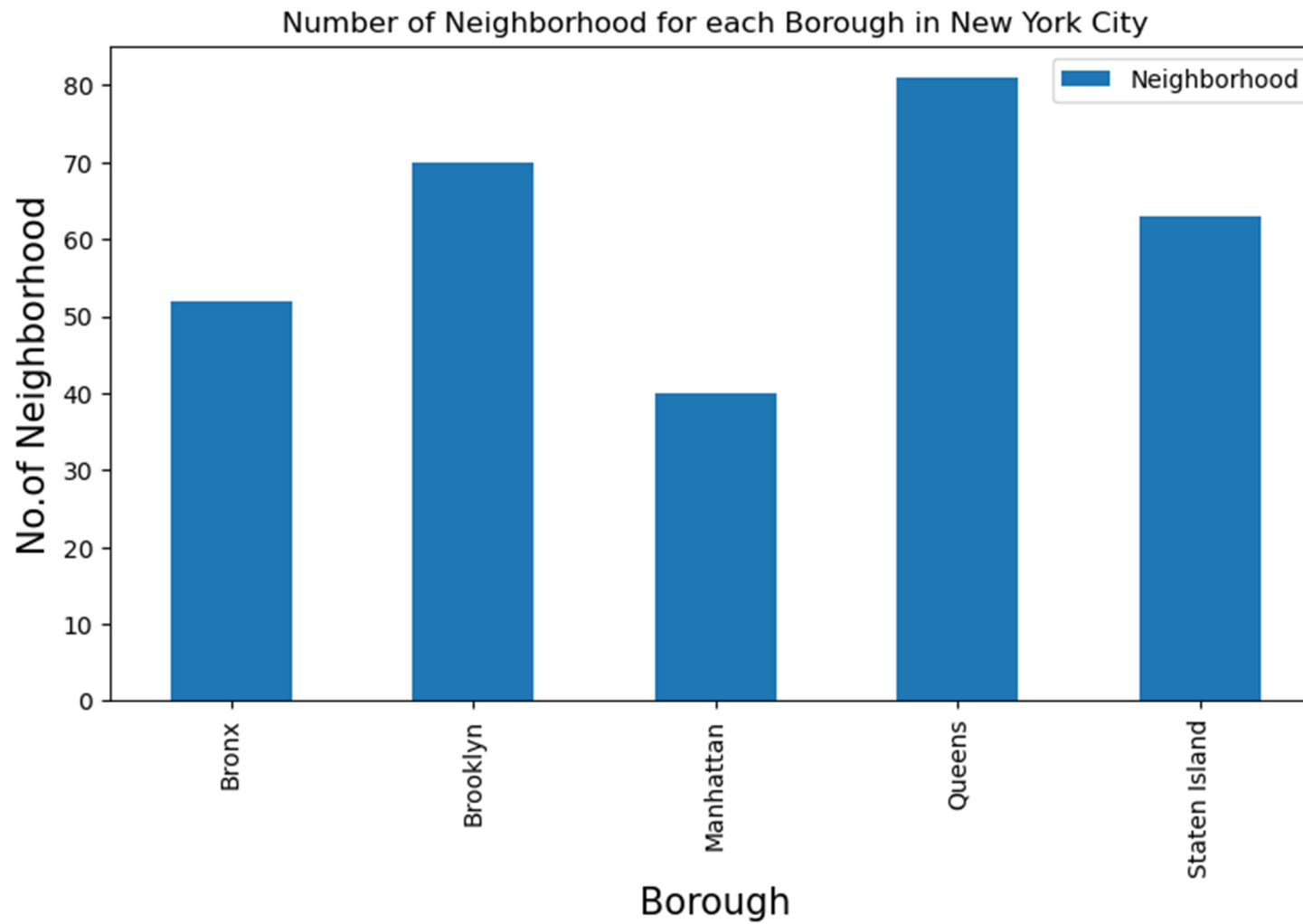
Lets visualize it

	B o r o u g h	N e i g h b o r h o o d	L a t i t u d e	L o n g i t u d e
0	B r o n x	W a k e f i e l d	4 0 . 8 9 4 7 0 5	- 7 3 . 8 4 7 2 0 1
1	B r o n x	C o - o p C i t y	4 0 . 8 7 4 2 9 4	- 7 3 . 8 2 9 9 3 9
2	B r o n x	E a s t c h e	4 0 . 8 8 7	- 7 3 . 8 8 2

	B o r o u g h	N e i g h b o r h o o d	L a t i t u d e	L o n g i t u d e
		st e r	5 5 6	7 8 0 6
3	B r o n x	F i e l d s t o n	4 0 . 8 9 5 4 3 7	- 7 3 . 9 0 5 6 4 3
4	B r o n x	R i v e r d a l e	4 0 . 8 9 0 8 3 4	- 7 3 . 9 1 2 5 8 5

So there are total of 306 different Neighborhoods in New York

In [16]:



We see that Queens has highest number of neighborhoods

Now we will collect Indian restaurants for each Neighborhood

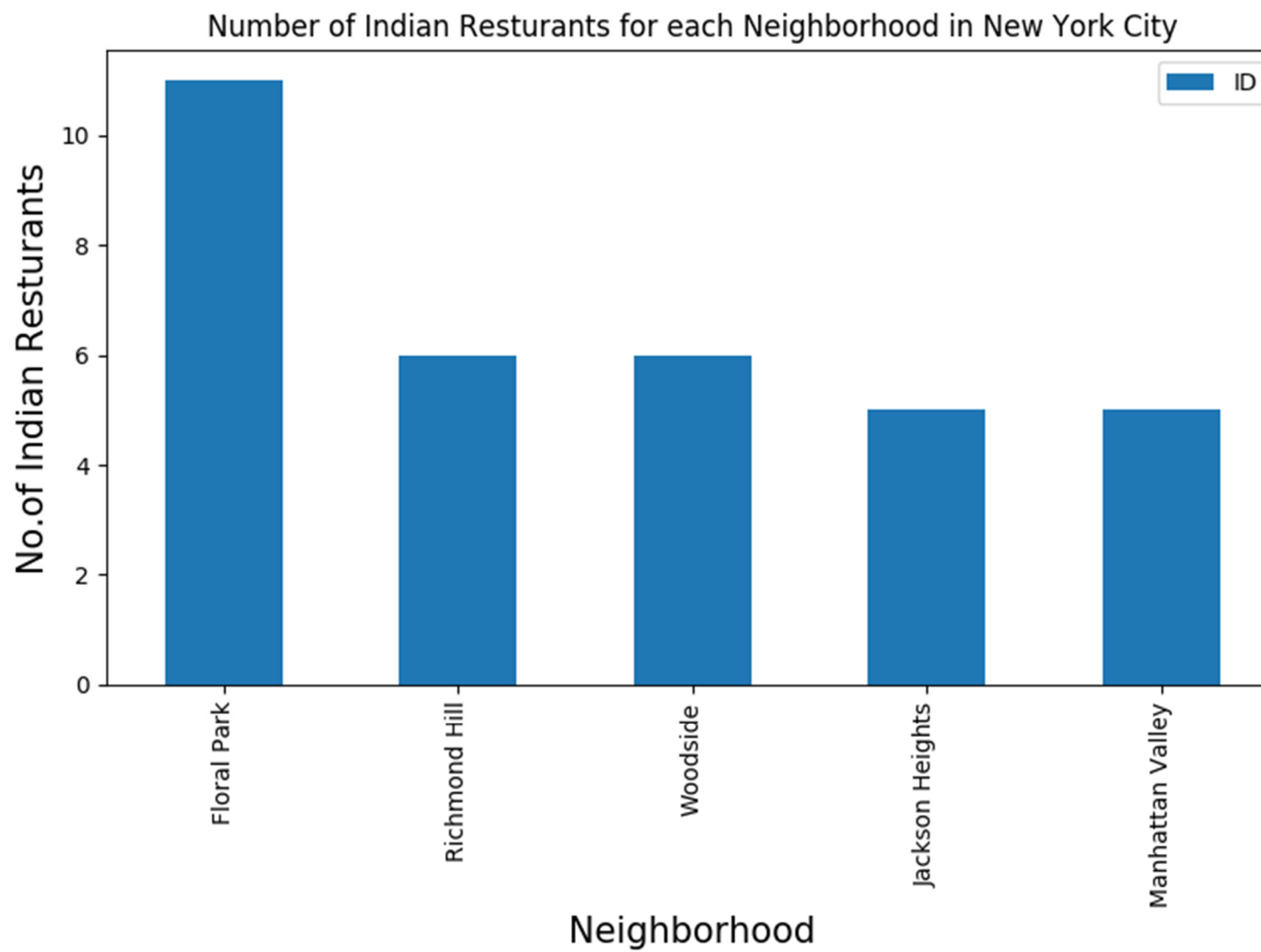
	Borough	Neighborhood	ID	Name
0	Bronx	Woodlawn	4c0448 d9310f c9b6bf 1dc761	Curry Spot
1	Bronx	Parkchester	4c1946 31838 020a13 e78e56 1	Melanie's Rooti Bar And Gr

	Borough	Neighborhood	ID	Name
				ill
2	Bronx	Spuyten Duyvil	4c0454 4df423 a593ac 83d116	Cumin Indian Cuisine
3	Bronx	Concours	551b7f 75498e 86c00a 0ed2e1	Hungry

	B o r o u g h	N e i g h b o r h o o d	ID	N a m e
		r s e		B i r d
4	B r o n x	U n i o n p o r t	4c1946 31838 020a13 e78e56 1	M e l a n i e s R o t i B a r A n d G r i l l



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	Borough	Neighborhood	ID	Name
103	Queens	Floral Park	4e4e3e22bde4101d0d7a5c2d1	Keralakitchen
104	Queens	Floral Park	4b647b56f964a520c4b62ae3	Usha Foods & Usha Sw

	Borough	Neighborhood	ID	Name
				ets
105	Queens	Floral Park	527ffc 0811d 2d329 d5e49 abd	Jackson Dinner
106	Queens	Floral Park	4b787 c49f9 64a52 09cd1 2ee3	Santorini

	Borough	Neighborhood	ID	Name
				an Restaurant
107	Queens	Floral Park	4c0c01e0bbc676b00d6b4cd5	Mumbai Express

	Borough	Neighborhood	ID	Name
108	Queens	Floral Park	4c76ff 35a56 76dcb 72671 721	Flavor Of India
109	Queens	Floral Park	4df0f3 9dd4c 04d03 92c85 3ea	Sagar Chinese

	Borough	Neighborhood	ID	Name
110	Queens	Floral Park	571af96a498e9e392d8d3786	Namaste Authentic Indian Cuisine

	Borough	Neighborhood	ID	Name
111	Queens	Floral Park	55d68c1b498ecf05fa196fe1	Namaste Restaurant and Cafe
112	Quee	Flora	4c3e17f2ca012d7	Mushi

	Borough	Neighborhood	ID	Name
	ns	l Park	f8202 2fbe	n' s H a l a l F o o d [G y r o C a r t]
113	Queens	Floral Park	4e6bf e1c7d 8b2c7 11b17 bbe5	Suryasw

	Borough	Neighborhood	ID	Name
		Floral Park		Indian Restaurants

So Floral Park in Queens has the highest number of Indian Restaurants with a total count of 9.

Now we will get the ranking of each restaurant for further analysis.

	B o r o u g h	N e i g h b o r h o o d	I D	N a m e			
	E r o n x	W o o d l a w n	4 c 0 4 4 8 d 9 3 1 0 f c 9 b 6 b f 1 d c 7 6 1	C u r r y S p o t			
	E r o	P a r k c	4 c 1 9 4	N e l a n			

	Borough	Neighborhood	ID	Name			
	Manhattan	Hester	6318380200a13e78e561	ies Rottier Ear And Corill			
	Brooklyn	Spuytenduck	4c04544df4	Cunin India			

	B o r o u g h	N e i g h b o r h o o d	I D	N a m e			
		v i l	2 3 a 5 9 3 a c 8 3 d 1 1 6	n C u i s i n e			
	E r o n x	C o n c o u r s e	5 5 1 b 7 f 7 5 4 9 8 e 8 6 c	H u n g r y E i r d			

	B o r o u g h	N e i g h b o r h o o d	I D	N a m e			
			0 0 a 0 e d 2 e 1				
	B r o n x	U n i o n p o r t	4 c 1 9 4 6 3 1 8 3 8 0 2 0 a 1 3 e 7 8	N e l l a n i e s R o t i E a r A n d C r			

	B o r o u g h	N e i g h b o r h o o d	I D	N a m e			
			e 5 6 1	i l l			

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In [28]:

	B o r o u g h	N e i g h b o r h o o d	I D	N a m e			
	B r o n x	W o o d l a	4 c 0 4 4 8	C u r r y S			

	Borough	Neighborhood	ID	Name			
		Wyn	d9310fc9b6bffdcd761	pot			
	Brooklyn	Parkchester	4c194631838	Nelanie Roberts			

	B o r o u g h	N e i g h b o r h o o d	I D	N a m e			
			0 2 0 a 1 3 e 7 8 e 5 6 1	i E a r A n d C r i l l			
	B r o n x	S p u y t e n D u y v i l	4 c 0 4 5 4 4 d f 4 2 3 a 5 9 3	C u n i n I n d i a n C u i s i			

	B o r o u g h	N e i g h b o r h o o d	I D	N a m e			
			a c 8 3 d 1 1 6	n e			
	B r o n x	C o n c o u r s e	5 5 1 b 7 f 7 5 4 9 8 e 8 6 c 0 0 a 0 e d	H u n g r y E i r d			

	B o r o u g h	N e i g h b o r h o o d	I D	N a m e			
			2 e 1				
	E r o n x	U n i o n p o r t	4 c 1 9 4 6 3 1 8 3 8 0 2 0 a 1 3 e 7 8 e 5 6 1	N e l a n i e s R o t i E a r A n d C r i l l			

	Neighborhood	Average Rating
28	Tribeca	9.00
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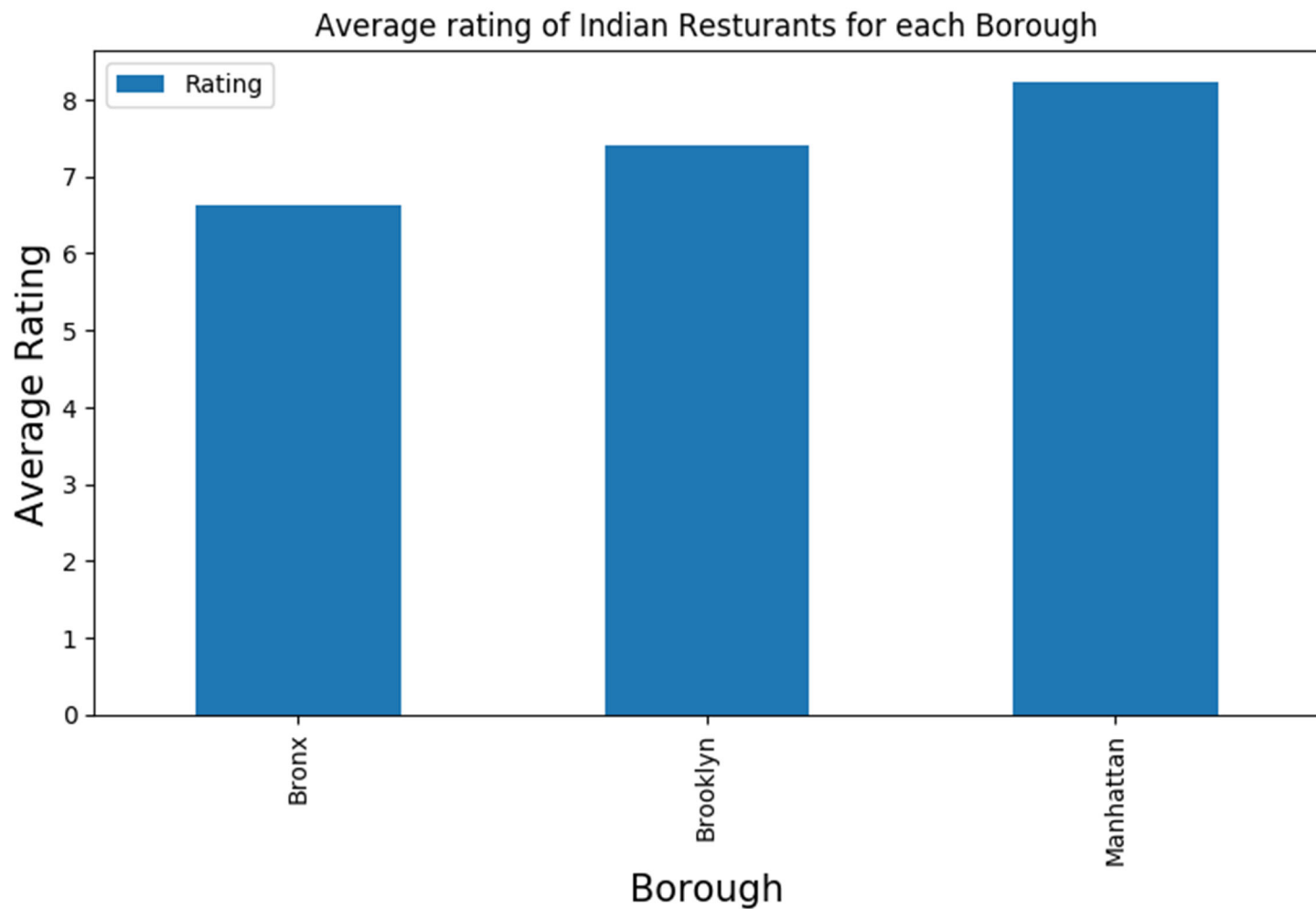
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	Borough	Average Rating
2	Manhattan	8.227273
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Similarly these are the average rating of Indian Restaurants for each Borough

Lets visualize it

In [43]:



We will consider all the neighborhoods with average rating greater or equal 9.0 to visualize on map

	Neighborhood	Average Rating
28	Tribeca	9.0

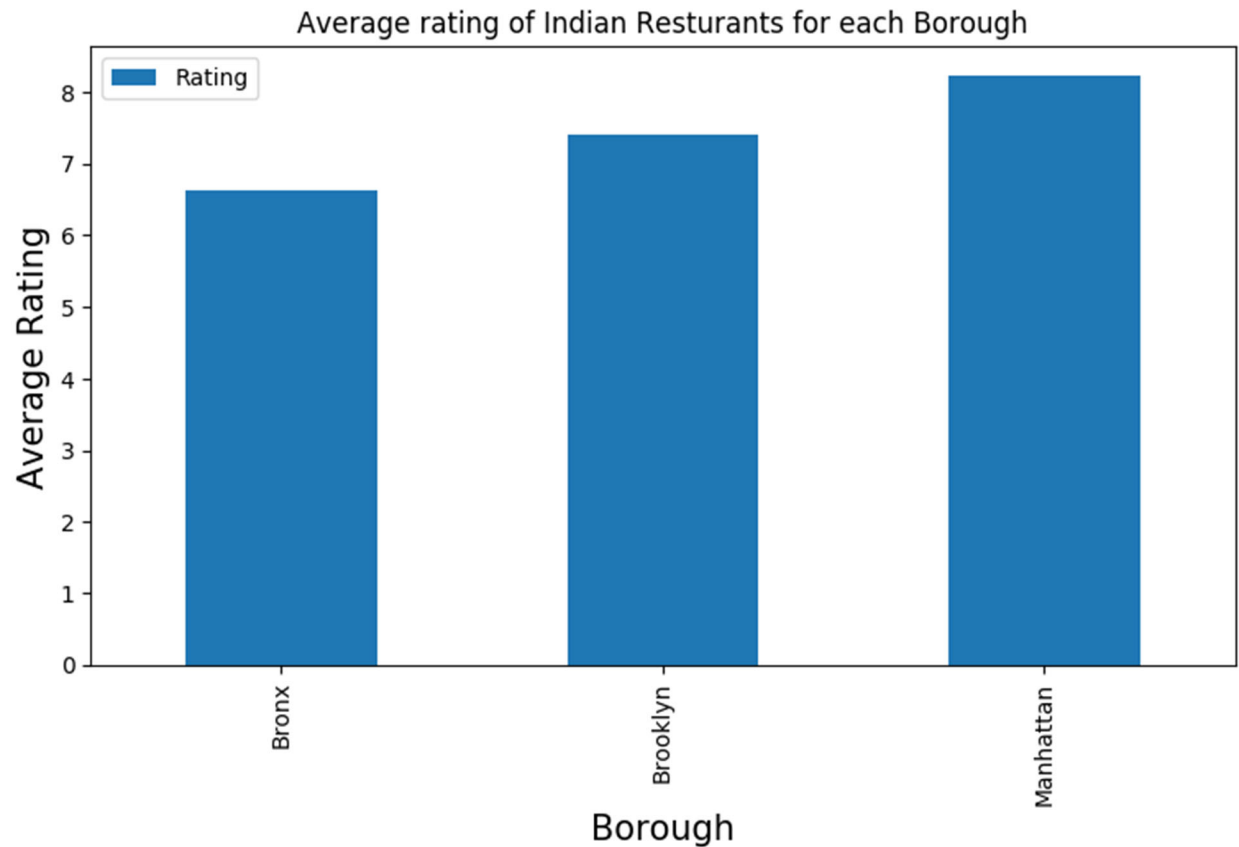
We will join this dataset to original New York data to get longitude and latitude

	Borough	Neighborhood	Latitude	Longitude	Average Rating
0	Manhattan	Tribeca	40.721522	-74.010683	9.0

Now we will show this data on a map

Let's add a new field to data frame for labeling purpose

Now that we have visualized the Neighborhoods. Let's Visualize Boroughs based on average Rating



We will consider all the neighborhoods with average rating greater or equal 9.0 to visualize on map

	Neighborhood	Average Rating
28	Tribeca	9.0

We will join this dataset to original New York data to get longitude and latitude

	Borough	Neighborhood	Latitude	Longitude	Average Rating
0	Manhattan	Trinbaca	40.721522	-74.010683	9.0

Now we will show this data on a map

Let's add a new field to data frame for labeling purpose

Now that we have visualized the Neighborhoods. Let's Visualize Boroughs based on average Rating

Conclusion

- Astoria(Queens), Blissville(Queens), Civic Center(Manhattan) are some of the best neighborhoods for indian cuisine.
- Manhattan have potential Indian Resturant Market
- Staten Island ranks last in average rating of Indian Resturants.
- Manhattan is the best place to stay if you prefer Indian Cuisine.
- Limitations
- The ranking is purely on basis of rating of resturants
- The accuracy of data depends purely depends on the data provided by FourSquare

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