

Introduction

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 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. This also means that the market is highly competitive. As it is highly developed city so cost of doing business is also one of the highest. Thus, any new business venture or expansion needs to be analyzed carefully. The insights derived from analysis will give good understanding of the business environment which help in strategically targeting the market. This will help in reduction of risk. And the Return on Investment will be reasonable.

Business Problem

The City of New York is famous for its excellent cuisine. Its food culture includes an array of international cuisines influenced by the city's immigrant history. Indian restaurants have become so popular in the United States now it seems that there is one on every corner, not only in major cities but also in smaller cities. Starting an Indian restaurant can be a great business opportunity, but you need to distinguish yourself from others to enjoy long-term success.

If you plan a real restaurant that can demand higher prices for Indian spices, delivered authentically from India, focus on neighborhoods and outlets that already attract a sophisticated Indian client for authentic taste. If you plan a cheap buffet restaurant, points to the masses looking for affordable high-traffic locations with large shopping centers and other local points of interest. So it is evident that to survive in such competitive market it is very important to startegically plan. Various factors need to be studied inorder to decide on the Location

My client wants to open his business in Brooklyn area as it is the city's most populous borough. Brooklyn is known for its cultural, social, and ethnic diversity, an independent art scene, distinct neighborhoods, and a distinctive architectural heritage, so I focus on that borough during my analysis. We define potential neighborhood based on the number of Indian Restaurants which are operating right in each neighborhood. Brooklyn has full potential but also is a very challenging district to open a business because of high competition. New Indian Restaurant should be open in an area that inadequate neighborhood in this way the bar can attract more customers. Therefore, this analysis necessary to ensure that we have enough customers and that we are not so close to other Indian Restaurant.

Data

1. **Data 1:** New York 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 which can be obtained for free from: https://geo.nyu.edu/catalog/nyu_2451_34572

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[4]:
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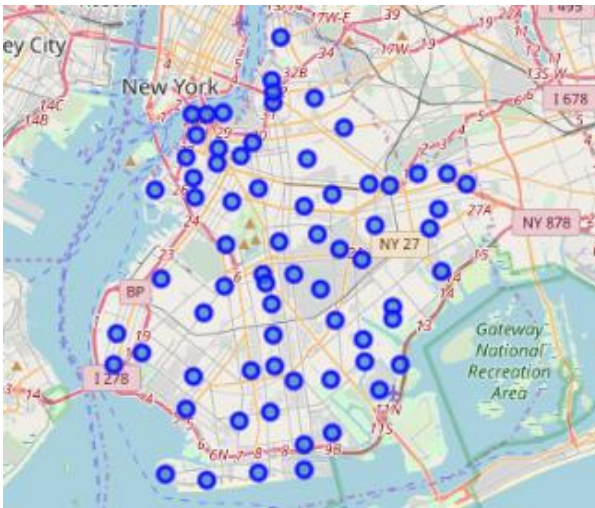
	Borough	Neighborhood	Latitude	Longitude
0	Bronx	Wakefield	40.894705	-73.847201
1	Bronx	Co-op City	40.874294	-73.829939
2	Bronx	Eastchester	40.887556	-73.827806
3	Bronx	Fieldston	40.895437	-73.905643
4	Bronx	Riverdale	40.890834	-73.912585

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[5]: neighborhoods['Borough'].value_counts()
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Queens	81
Brooklyn	70
Staten Island	63
Bronx	52
Manhattan	40

Name: Borough, dtype: int64

Here, we can also see that Brooklyn has 70 neighborhood, i.e. second largest in new york city.



Data2: New York City geographical coordinates data will be utilized as input for the Foursquare API that will be leveraged to provision venues information for each neighborhood. We will use the Foursquare API to explore neighborhoods in New York City. The below is image of the Foursquare API data.

In addition, Indian Restaurant category Id - 4bf58dd8d48988d10f941735 is used for retrieving data from Foursquare API.

Methodology

In this project, I will use the basic methodology as taught in Week 3 lab.

	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

Above, I have done convert addresses into their equivalent latitude and longitude values. Then we will use the Foursquare API to explore neighborhoods in Brooklyn, New York. After that, explore function to get Indian restaurant categories in each neighborhood.

	Neighborhood	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
0	Bay Ridge	40.625801	-74.030621	Bombay Grill	40.622331	-74.031561	Indian Restaurant
1	Bay Ridge	40.625801	-74.030621	Mohims Indian Cuisine	40.632732	-74.027260	Indian Restaurant
2	Bay Ridge	40.625801	-74.030621	King of Tandoor	40.631836	-74.032477	Indian Restaurant
3	Bay Ridge	40.625801	-74.030621	India Passage	40.631856	-74.027576	Indian Restaurant
4	Bay Ridge	40.625801	-74.030621	Taj Mahal	40.632373	-74.027193	Indian Restaurant

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newyork_venues_indian.shape
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(272, 7)
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Indian Restaurant in Brooklyn

Results

K-mean Cluster Using K-mean to clustering data area with less number of Indian Restaurants.

Cluster 0

[27]:

	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	
0	Bay Ridge	Indian Restaurant	North Indian Restaurant	Indian Sweet Shop	Indian Chinese Restaurant	Halal Restaurant	Food Truck	Coffee Shop	Chinese Restaurant	Caribbean Restaurant	
1	Bensonhurst	Indian Restaurant	North Indian Restaurant	Indian Sweet Shop	Indian Chinese Restaurant	Halal Restaurant	Food Truck	Coffee Shop	Chinese Restaurant	Caribbean Restaurant	
2	Sunset Park	Indian Restaurant	North Indian Restaurant	Indian Sweet Shop	Indian Chinese Restaurant	Halal Restaurant	Food Truck	Coffee Shop	Chinese Restaurant	Caribbean Restaurant	
3	Greenpoint	Indian Restaurant	North Indian Restaurant	Indian Sweet Shop	Indian Chinese Restaurant	Halal Restaurant	Food Truck	Coffee Shop	Chinese Restaurant	Caribbean Restaurant	
5	Brighton Beach	Indian Restaurant	North Indian Restaurant	Indian Sweet Shop	Indian Chinese Restaurant	Halal Restaurant	Food Truck	Coffee Shop	Chinese Restaurant	Caribbean Restaurant	
6	Sheepshead Bay	Indian Restaurant	North Indian Restaurant	Indian Sweet Shop	Indian Chinese Restaurant	Halal Restaurant	Food Truck	Coffee Shop	Chinese Restaurant	Caribbean Restaurant	
7	Manhattan Terrace	Indian Restaurant	North Indian Restaurant	Indian Sweet Shop	Indian Chinese Restaurant	Halal Restaurant	Food Truck	Coffee Shop	Chinese Restaurant	Caribbean Restaurant	
9	Crown Heights	Indian Restaurant	North Indian Restaurant	Indian Sweet Shop	Indian Chinese Restaurant	Halal Restaurant	Food Truck	Coffee Shop	Chinese Restaurant	Caribbean Restaurant	
10	East Flatbush	Indian Restaurant	North Indian Restaurant	Indian Sweet Shop	Indian Chinese Restaurant	Halal Restaurant	Food Truck	Coffee Shop	Chinese Restaurant	Caribbean Restaurant	
12	Windsor Terrace	Indian Restaurant	North Indian Restaurant	Indian Sweet Shop	Indian Chinese Restaurant	Halal Restaurant	Food Truck	Coffee Shop	Chinese Restaurant	Caribbean Restaurant	
13	Prospect Heights	Indian Restaurant	North Indian Restaurant	Indian Sweet Shop	Indian Chinese Restaurant	Halal Restaurant	Food Truck	Coffee Shop	Chinese Restaurant	Caribbean Restaurant	
15	Williamsburg	Indian Restaurant	North Indian Restaurant	Indian Sweet Shop	Indian Chinese Restaurant	Halal Restaurant	Food Truck	Coffee Shop	Chinese Restaurant	Caribbean Restaurant	
16	Bushwick	Indian Restaurant	North Indian Restaurant	Indian Sweet Shop	Indian Chinese Restaurant	Halal Restaurant	Food Truck	Coffee Shop	Chinese Restaurant	Caribbean Restaurant	
17	Bedford Stuyvesant	Indian Restaurant	North Indian Restaurant	Indian Sweet Shop	Indian Chinese Restaurant	Halal Restaurant	Food Truck	Coffee Shop	Chinese Restaurant	Caribbean Restaurant	
19	Cobble Hill	Indian Restaurant	North Indian Restaurant	Indian Sweet Shop	Indian Chinese Restaurant	Halal Restaurant	Food Truck	Coffee Shop	Chinese Restaurant	Caribbean Restaurant	
20	Carroll Gardens	Indian Restaurant	North Indian Restaurant	Indian Sweet Shop	Indian Chinese Restaurant	Halal Restaurant	Food Truck	Coffee Shop	Chinese Restaurant	Caribbean Restaurant	

22	Gowanus	Indian Restaurant	North Indian Restaurant	Indian Sweet Shop	Indian Chinese Restaurant	Halal Restaurant	Food Truck	Coffee Shop	Chinese Restaurant	Caribbean Restaurant
24	Park Slope	Indian Restaurant	North Indian Restaurant	Indian Sweet Shop	Indian Chinese Restaurant	Halal Restaurant	Food Truck	Coffee Shop	Chinese Restaurant	Caribbean Restaurant
33	Bath Beach	Indian Restaurant	North Indian Restaurant	Indian Sweet Shop	Indian Chinese Restaurant	Halal Restaurant	Food Truck	Coffee Shop	Chinese Restaurant	Caribbean Restaurant
34	Borough Park	Indian Restaurant	North Indian Restaurant	Indian Sweet Shop	Indian Chinese Restaurant	Halal Restaurant	Food Truck	Coffee Shop	Chinese Restaurant	Caribbean Restaurant
35	Dyker Heights	Indian Restaurant	North Indian Restaurant	Indian Sweet Shop	Indian Chinese Restaurant	Halal Restaurant	Food Truck	Coffee Shop	Chinese Restaurant	Caribbean Restaurant
36	Gerritsen Beach	Indian Restaurant	North Indian Restaurant	Indian Sweet Shop	Indian Chinese Restaurant	Halal Restaurant	Food Truck	Coffee Shop	Chinese Restaurant	Caribbean Restaurant
38	Clinton Hill	Indian Restaurant	North Indian Restaurant	Indian Sweet Shop	Indian Chinese Restaurant	Halal Restaurant	Food Truck	Coffee Shop	Chinese Restaurant	Caribbean Restaurant
43	Ocean Hill	Indian Restaurant	North Indian Restaurant	Indian Sweet Shop	Indian Chinese Restaurant	Halal Restaurant	Food Truck	Coffee Shop	Chinese Restaurant	Caribbean Restaurant
44	City Line	Indian Restaurant	North Indian Restaurant	Indian Sweet Shop	Indian Chinese Restaurant	Halal Restaurant	Food Truck	Coffee Shop	Chinese Restaurant	Caribbean Restaurant
49	East Williamsburg	Indian Restaurant	North Indian Restaurant	Indian Sweet Shop	Indian Chinese Restaurant	Halal Restaurant	Food Truck	Coffee Shop	Chinese Restaurant	Caribbean Restaurant
50	North Side	Indian Restaurant	North Indian Restaurant	Indian Sweet Shop	Indian Chinese Restaurant	Halal Restaurant	Food Truck	Coffee Shop	Chinese Restaurant	Caribbean Restaurant
51	South Side	Indian Restaurant	North Indian Restaurant	Indian Sweet Shop	Indian Chinese Restaurant	Halal Restaurant	Food Truck	Coffee Shop	Chinese Restaurant	Caribbean Restaurant
52	Ocean Parkway	Indian Restaurant	North Indian Restaurant	Indian Sweet Shop	Indian Chinese Restaurant	Halal Restaurant	Food Truck	Coffee Shop	Chinese Restaurant	Caribbean Restaurant
53	Fort Hamilton	Indian Restaurant	North Indian Restaurant	Indian Sweet Shop	Indian Chinese Restaurant	Halal Restaurant	Food Truck	Coffee Shop	Chinese Restaurant	Caribbean Restaurant
55	Wingate	Indian Restaurant	North Indian Restaurant	Indian Sweet Shop	Indian Chinese Restaurant	Halal Restaurant	Food Truck	Coffee Shop	Chinese Restaurant	Caribbean Restaurant
63	Weeksville	Indian Restaurant	North Indian Restaurant	Indian Sweet Shop	Indian Chinese Restaurant	Halal Restaurant	Food Truck	Coffee Shop	Chinese Restaurant	Caribbean Restaurant
64	Broadway Junction	Indian Restaurant	North Indian Restaurant	Indian Sweet Shop	Indian Chinese Restaurant	Halal Restaurant	Food Truck	Coffee Shop	Chinese Restaurant	Caribbean Restaurant

59	Wingate	Indian Restaurant	North Indian Restaurant	Indian Sweet Shop	Restaurant	Halal Restaurant	Food Truck	Coffee Shop	Chinese Restaurant	Caribbean Restaurant
63	Weeksville	Indian Restaurant	North Indian Restaurant	Indian Sweet Shop	Indian Chinese Restaurant	Halal Restaurant	Food Truck	Coffee Shop	Chinese Restaurant	Caribbean Restaurant
64	Broadway Junction	Indian Restaurant	North Indian Restaurant	Indian Sweet Shop	Indian Chinese Restaurant	Halal Restaurant	Food Truck	Coffee Shop	Chinese Restaurant	Caribbean Restaurant
66	Homecrest	Indian Restaurant	North Indian Restaurant	Indian Sweet Shop	Indian Chinese Restaurant	Halal Restaurant	Food Truck	Coffee Shop	Chinese Restaurant	Caribbean Restaurant
68	Madison	Indian Restaurant	North Indian Restaurant	Indian Sweet Shop	Indian Chinese Restaurant	Halal Restaurant	Food Truck	Coffee Shop	Chinese Restaurant	Caribbean Restaurant

Cluster 1

[28]:											
	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
57	Remsen Village	Caribbean Restaurant	North Indian Restaurant	Indian Sweet Shop	Indian Restaurant	Indian Chinese Restaurant	Halal Restaurant	Food Truck	Coffee Shop	Chinese Restaurant	

Cluster 2

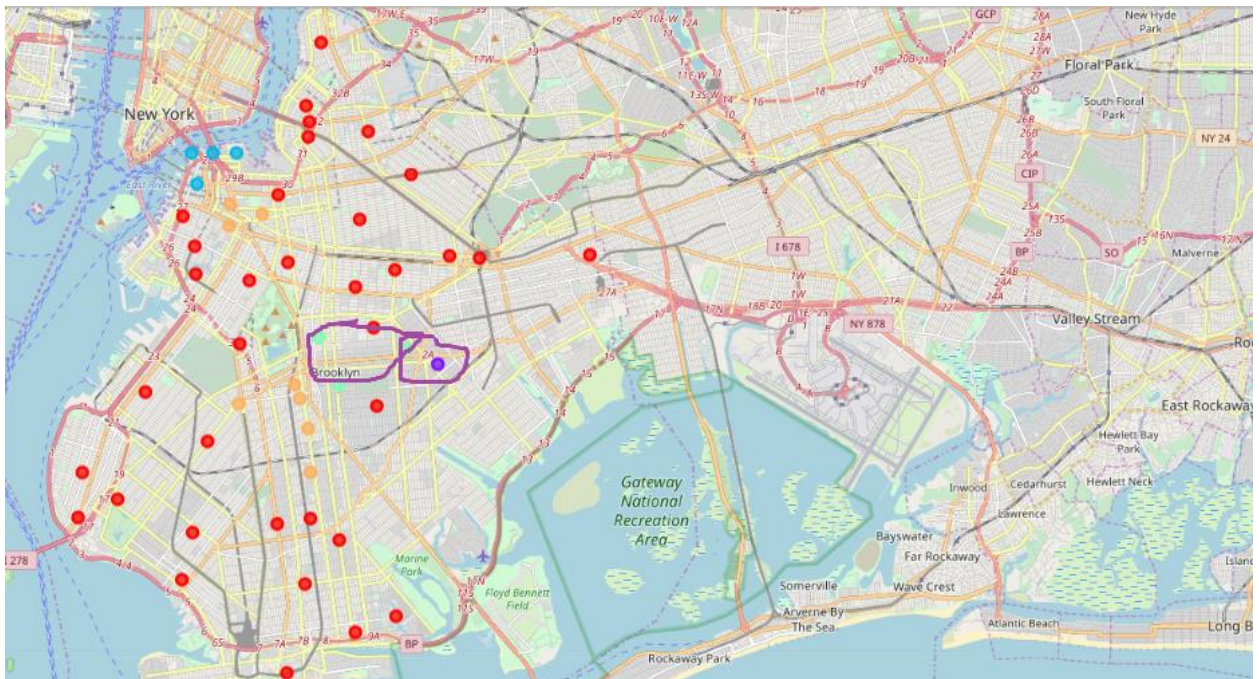
[29]:											
	Neighborhood	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue	9th Most Common Venue	10th Most Common Venue
18	Brooklyn Heights	Indian Restaurant	Indian Sweet Shop	North Indian Restaurant	Indian Chinese Restaurant	Halal Restaurant	Food Truck	Coffee Shop	Chinese Restaurant	Caribbean Restaurant	
61	Fulton Ferry	Indian Restaurant	Food Truck	Indian Sweet Shop	North Indian Restaurant	Indian Chinese Restaurant	Halal Restaurant	Coffee Shop	Chinese Restaurant	Caribbean Restaurant	
62	Vinegar Hill	Indian Sweet Shop	Indian Restaurant	North Indian Restaurant	Indian Chinese Restaurant	Halal Restaurant	Food Truck	Coffee Shop	Chinese Restaurant	Caribbean Restaurant	
65	Dumbo	Indian Restaurant	Indian Sweet Shop	North Indian Restaurant	Indian Chinese Restaurant	Halal Restaurant	Food Truck	Coffee Shop	Chinese Restaurant	Caribbean 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
42 Prospect Lefferts Gardens	Indian Restaurant	Coffee Shop	Caribbean Restaurant	North Indian Restaurant	Indian Sweet Shop	Indian Chinese Restaurant	Halal Restaurant	Food Truck	Chinese Restaurant
56 Rugby	Indian Restaurant	Caribbean Restaurant	North Indian Restaurant	Indian Sweet Shop	Indian Chinese Restaurant	Halal Restaurant	Food Truck	Coffee Shop	Chinese Restaurant
69 Erasmus	Indian Restaurant	Caribbean Restaurant	North Indian Restaurant	Indian Sweet Shop	Indian Chinese Restaurant	Halal Restaurant	Food Truck	Coffee Shop	Chinese 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
8 Flatbush	Indian Restaurant	Halal Restaurant	Café	North Indian Restaurant	Indian Sweet Shop	Indian Chinese Restaurant	Food Truck	Coffee Shop	Chinese Restaurant
11 Kensington	Indian Restaurant	Indian Chinese Restaurant	North Indian Restaurant	Indian Sweet Shop	Halal Restaurant	Food Truck	Coffee Shop	Chinese Restaurant	Caribbean Restaurant
23 Fort Greene	Indian Restaurant	Chinese Restaurant	North Indian Restaurant	Indian Sweet Shop	Indian Chinese Restaurant	Halal Restaurant	Food Truck	Coffee Shop	Caribbean Restaurant
40 Downtown	Indian Restaurant	Chinese Restaurant	North Indian Restaurant	Indian Sweet Shop	Indian Chinese Restaurant	Halal Restaurant	Food Truck	Coffee Shop	Caribbean Restaurant
41 Boerum Hill	Indian Restaurant	Chinese Restaurant	North Indian Restaurant	Indian Sweet Shop	Indian Chinese Restaurant	Halal Restaurant	Food Truck	Coffee Shop	Caribbean Restaurant
46 Midwood	Indian Restaurant	Halal Restaurant	North Indian Restaurant	Indian Sweet Shop	Indian Chinese Restaurant	Food Truck	Coffee Shop	Chinese Restaurant	Caribbean Restaurant
47 Prospect Park South	Indian Restaurant	Caribbean Restaurant	Café	North Indian Restaurant	Indian Sweet Shop	Indian Chinese Restaurant	Halal Restaurant	Food Truck	Coffee Shop
54 Ditmas Park	Indian Restaurant	Caribbean Restaurant	Café	North Indian Restaurant	Indian Sweet Shop	Indian Chinese Restaurant	Halal Restaurant	Food Truck	Coffee Shop



Based on data frame analysis above Cluster 1 (Ramsen Village) and Cluster 3 (Rugby, erasmus, PL gardens) areas are the best places to open a new Indian Restaurants business.

Discussion

In this section, I would be discussing the observations I have noted and the recommendations that I can make based on the results.

This analysis is performed on limited data. This may be right or may be wrong. But if good amount of data is available there is scope to come up with better results.

- Ramsen Village, is one of the good locations to open an Indian restaurant but Indian restaurants are second most common place instead of first.
- Rugby, Erasmus and PL gardens are the neighborhoods which have the potential to be a good spot for an Indian Restaurant.
- It can be done more detailed analysis by adding other factors such as transportation, demographics of inhabitants.

Finally, FourSquare proved to be a good source of data but frustrating at times. Despite having a Developer account I regularly exceeded my hourly limit locking me out for the day.

Conclusion

Although all of the goals of this project were met there is definitely room for further improvement and development as noted below. However, the goals of the project were met and, with some more work, could easily be developed into a fully-fledged application that could support the opening a business idea in an unknown location.

As per the neighborhood or restaurant type mentioned like Indian restaurants analysis can be checked. A venue with lowest risk and competition can be identified