

1. Discussion and Background of the Business Problem:

Vegetarian/Vegan Restaurants

The capstone project explores the best locations for Vegetarian and Vegan people. New York is a major metropolitan area with more than 8,419 million (United States Census Bureau, 2019) people living within city limits. In addition, New York is a popular tourist point for people from all over the world. New York City is the largest city in the United States with a long history of international immigration. According to Top Trends in Prepared Foods 2017 report 8% of the US population is vegetarian and 6% of the US population is vegan. Hence, vegetarian/vegan food trend is getting more popular, it is important for natives and tourists to get access to the best restaurants.

Target Audience

- Business personnel who wants to invest or open a vegan/vegetarian restaurant.
- The eco-friendly people who care about planet and eat responsibly
- Finding the best location for opening a restaurant.
- Exploratory Data Analysis techniques to obtain necessary data, analyze it and, finally be able to tell a story out of it.

Problem Statement

1. What is the best location for an Vegan/Vegetarian restaurant in New York City?
2. In what Neighborhood should I open a Vegan/Vegetarian restaurant to have the best chance of being successful?
3. The hint map where tourists/natives can find the biggest number of Vegan/Vegetarian restaurants

Data Section

For this project the following data was used:

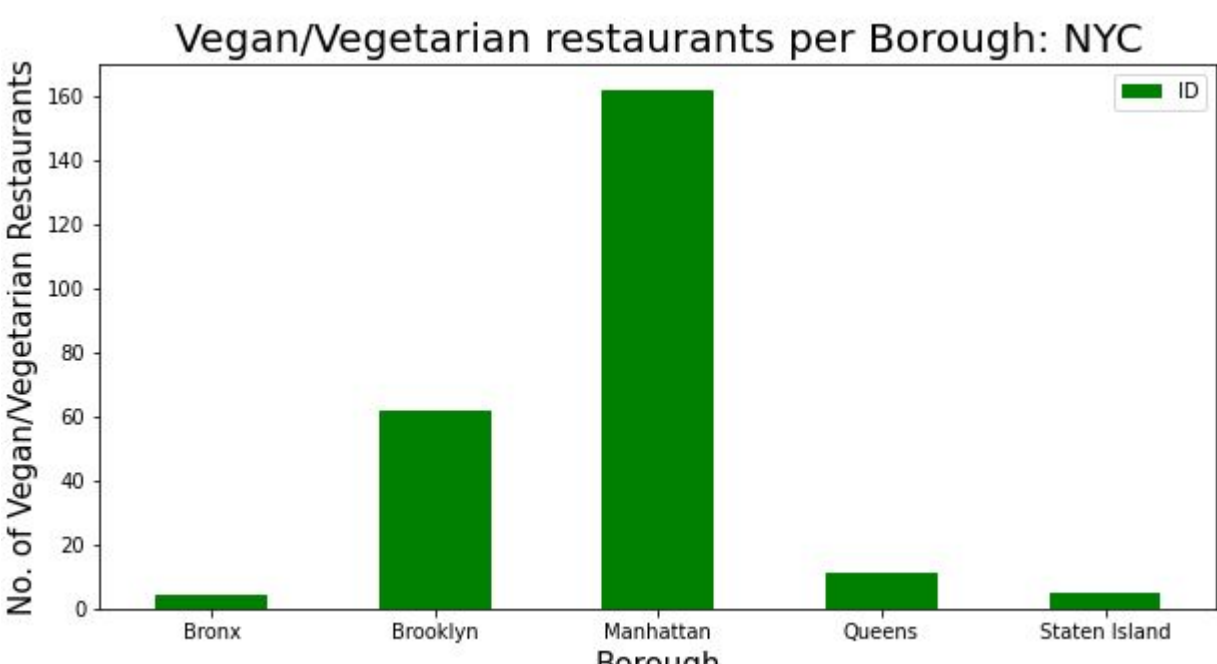
1. New York City data that contains Borough, Neighborhoods along with their coordinates (latitudes and longitudes)
 - Data Source: https://cocl.us/new_york_dataset
 - Description: This data set contains the required information. And we will use this data set to explore various neighborhoods of New York city.
2. Vegan/Vegetarian restaurants in all neighborhood of New York city (focusing only on one neighborhood) .
 - Data Source: Foursquare API
 - Description: By using this API we will get all the venues in the Queens neighborhood. We can filter these venues to get only Vegetarian/Vegan restaurants.

Approach

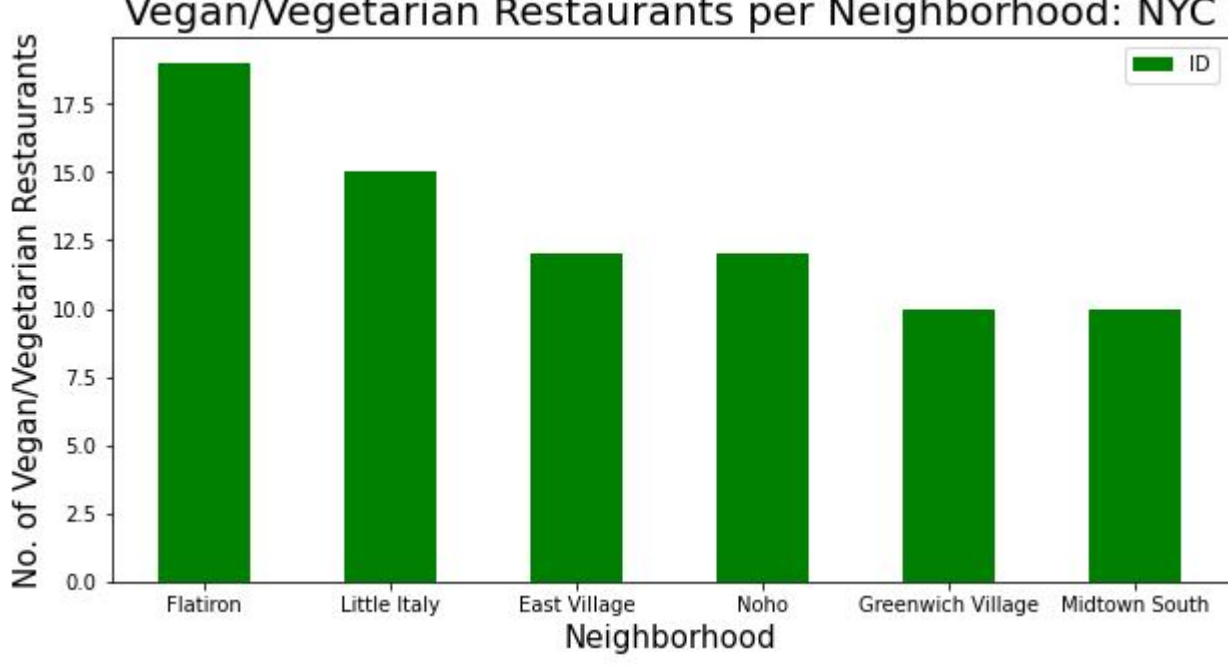
- Collect the New York city data from https://cocl.us/new_york_dataset
- Using Foursquare API we will get all venues for each neighborhood.
- Filter out all venues which are under category id for Vegetarian/Vegan food.
- Data Visualization and some statistical analysis.
- Visualize the neighborhood with several Indian Restaurants.
- Compare the Neighborhoods to Find the Best Place for Starting up a Restaurant.

Results

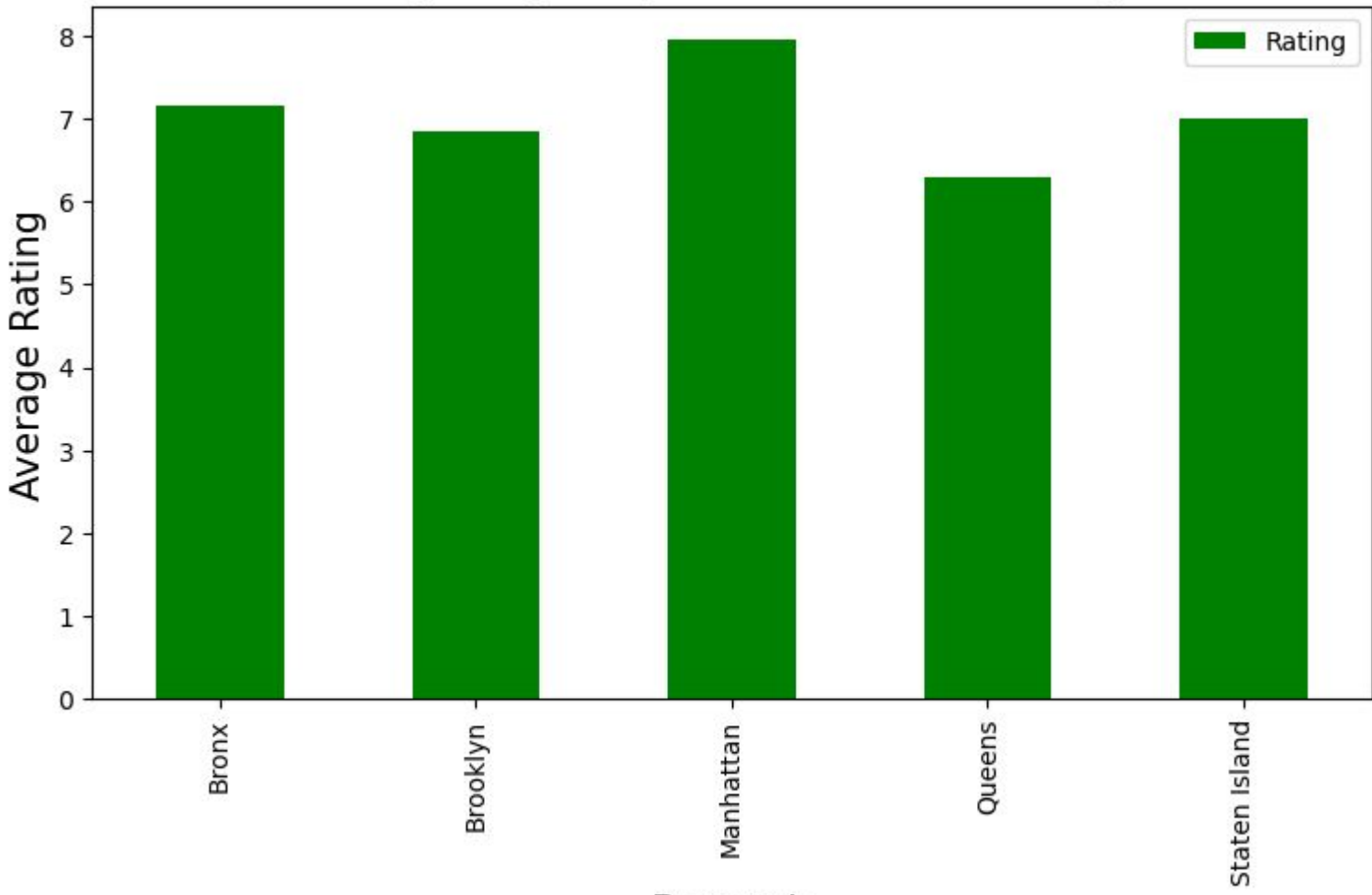
1. The highest number of Vegetarian/Vegan restaurants is in Manhattan



2. The biggest number of Vegetarian/Vegan food could be found in Flatiron Neighborhood (Manhattan)



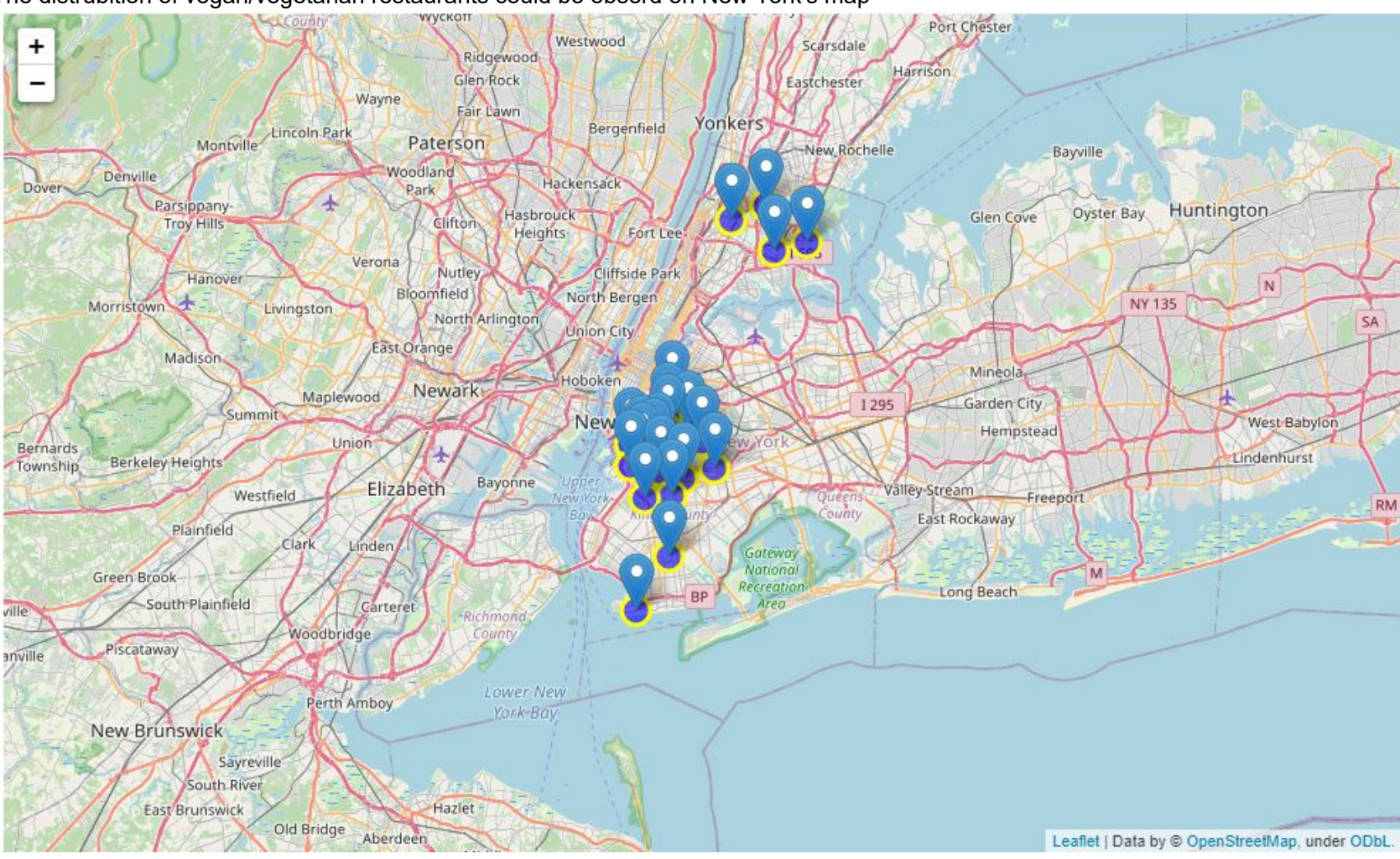
3. On Average on Manhattan Green restaurants have the best Ranking.



4. Due to a limitation of number of requests that could be done by Foursquare API, I was not able to obtain detail information about venues. Hence, the best Neighborhood is North Side in Brooklyn

	Borough	Neighborhood	Latitude	Longitude	Avg Rating
0	Brooklyn	Boerum Hill	40.685683	-73.983748	2.200000
1	Brooklyn	Brooklyn Heights	40.695864	-73.993782	6.700000
2	Brooklyn	Bushwick	40.698116	-73.925258	2.433333
3	Brooklyn	Carroll Gardens	40.680540	-73.994654	7.500000
4	Brooklyn	Clinton Hill	40.693229	-73.967843	0.000000
5	Brooklyn	Coney Island	40.574293	-73.988683	0.000000
6	Bronx	Country Club	40.844246	-73.824099	0.000000
7	Brooklyn	Crown Heights	40.670829	-73.943291	0.000000
8	Brooklyn	Downtown	40.690844	-73.983463	3.100000
9	Brooklyn	East Williamsburg	40.708492	-73.938858	8.275000
10	Bronx	Fordham	40.860997	-73.896427	0.000000
11	Brooklyn	Fort Greene	40.688527	-73.972906	4.966667
12	Brooklyn	Greenpoint	40.730201	-73.954241	5.950000
13	Brooklyn	Manhattan Terrace	40.614433	-73.957438	0.000000
14	Brooklyn	North Side	40.714823	-73.958809	8.420000
15	Brooklyn	Ocean Hill	40.678403	-73.913068	8.300000
16	Bronx	Olinville	40.871371	-73.863324	0.000000
17	Bronx	Parkchester	40.837938	-73.856003	0.000000
18	Brooklyn	Prospect Heights	40.676822	-73.964859	2.980000
19	Brooklyn	Prospect Lefferts Gardens	40.658420	-73.954899	0.000000
20	Brooklyn	Williamsburg	40.707144	-73.958115	2.766667
21	Brooklyn	Windsor Terrace	40.656946	-73.980073	0.000000

5. The distribution of vegan/vegetarian restaurants could be observed on New York's map



Discussion

Based on the results of analysis, I would state that Manhattan and are the best locations for Vegan/Vegetarian cuisine in NYC. To have the best shot of success, I would open a Green restaurant in Manhattan or Brooklyn. Brooklyn has multiple neighborhoods with average ratings exceeding 8.0 on a scale of 1.0 to 10.0 and has a smaller number of Vegan food than Manhattan, making competition easier. However, in Brooklyn there are multiple Vegetarian restaurants with poor rating < 5. In addition, we should keep in mind, that real estate prices in Brooklyn are much cheaper than in Manhattan. Particularly, I would recommend considering opening an Vegan/Vegetarian Restaurant either in North Side, because this neighborhood has the highest rating for Green restaurants.

Limitations

All of the above analysis is dependent on the accuracy of Four Square data. Besides, during this project, we used a free Sandbox Tier Account of Foursquare API that goes with limitations as to the number of API calls and results returned. That makes it impossible to obtain a more comprehensive analysis of restaurants in Manhattan which could be much better than Brooklyn. To get better results, future research work and more comprehensive analysis could consider using a paid account to bypass these limitations as well as incorporating data from other external databases.

Conclusions

In the project I have gone through the process of identifying the business problem, specifying the data required, extracting, and preparing the data, performing data analysis, and lastly providing recommendations to the investors/developers or people looking for a good, vegan/vegetarian food. During the project, I applied different data science methods and instruments to get the answer to our main question: "Where in the City of New York, should the a person look for an Vegetarian/Vegan Restaurant?" The findings in this project will also help the relevant investor better understand the advantages and disadvantages of different NYC neighborhoods/boroughs in terms of opening a Green restaurant.