Capstone Project - The Battle of Neighborhoods

Introduction

Manhattan, land of opportunities! With this slogan many people are projected to an immediate, complete and fruitful business idea. Manhattan is a land of charm, where the smile of its people and the honesty of its inhabitants create an atmosphere of opportunities. It enjoys a culture willing to serve those who need it most. In short, it is a land where everyone struggles and shows that they are capable of leading a satisfying lifestyle.

Different local media have carried out studies in order to determine which are the jobs that immediately generate income. In this sense, a population census revealed that people prefer four types of businesses. In relation to the social group within which it operates in everyday life. We can also infer that they are closely related to immediate customer satisfaction.

Opening a boxing gym is one of those adventures carried out by passionate fitness, health and well-being. In addition, it is one of the most booming businesses due to the growing interest by the population in practicing sports and leading a healthy lifestyle. This project could be of interest to young entrepreneurs who want to create their own business, renting a place where they can equip it to provide the physical conditioning service, either through the use of exercise machines or simply using only body weight.

Business Problem

Which neighborhood should I choose to open a boxing gym in the city of Manhattan?

There are around 200 gyms in Manhattan but not all of them are designed for boxers, that need another kind of training and enviroment. Finding a suitable place for the target audience, thinking about accessibility and visibility, where customers are expected to park their vehicles and, above all, be in a quiet and safe area.

Data

We are going to use a json file that has New York data: https://cf-courses-data.s3.us.cloud-object-storage.appdomain.cloud/IBMDeveloperSkillsNetwork-DS0701EN-SkillsNetwork/labs/newyork_data.json. Also, we are going to implement the Foursquare API to explore the neighborhoods and segment them.

Combining the data from all of these sources will clearly demonstrate the following:

- Which neighborhoods in Manhattan have clusters of like boxing gym.

- How populated each neighborhoods is.

- Which neighborhood should he target to open a new boxing gym.

Methodology

In this project we will use the k-means clustering algorithm to complete this task. Finally, you will use the Folium library to visualize the neighborhoods in Toronto and their emerging clusters.

First, we have to collect the information about the location of every gym located in Manhattan, we do this using Foursquare categorization.

Then, our analysis will be focus in calculate and explore the density of gyms across different areas of Manhattan - we will use maps to identify areas that are far away from gym and could be a good choice to rent a place.

Finally, we will focus on most promising areas and within those create clusters of locations. We will take into consideration locations with no gyms on the same street or with a radius of 200 meters. We will present map of all such locations but also create clusters (using k-means clustering) of those locations to identify a location which should be a starting point for explore and search for optimal venue location.
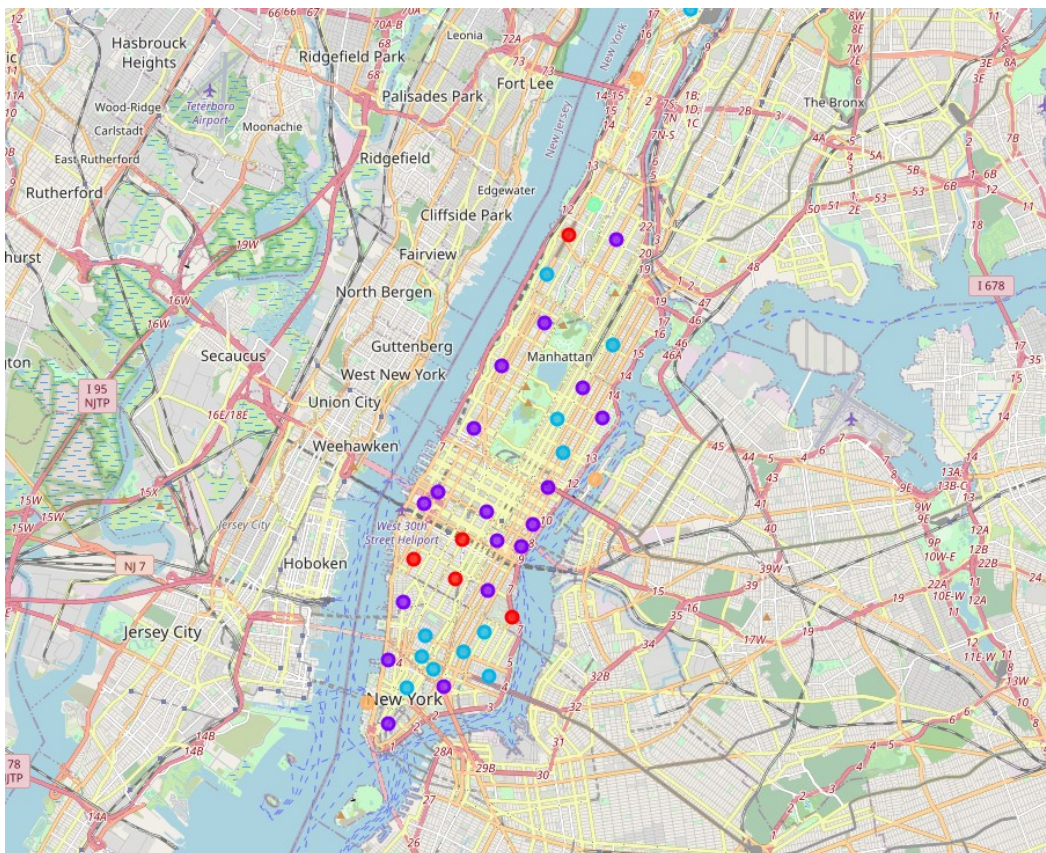
Map generated with Neighborhoods of Manhattan
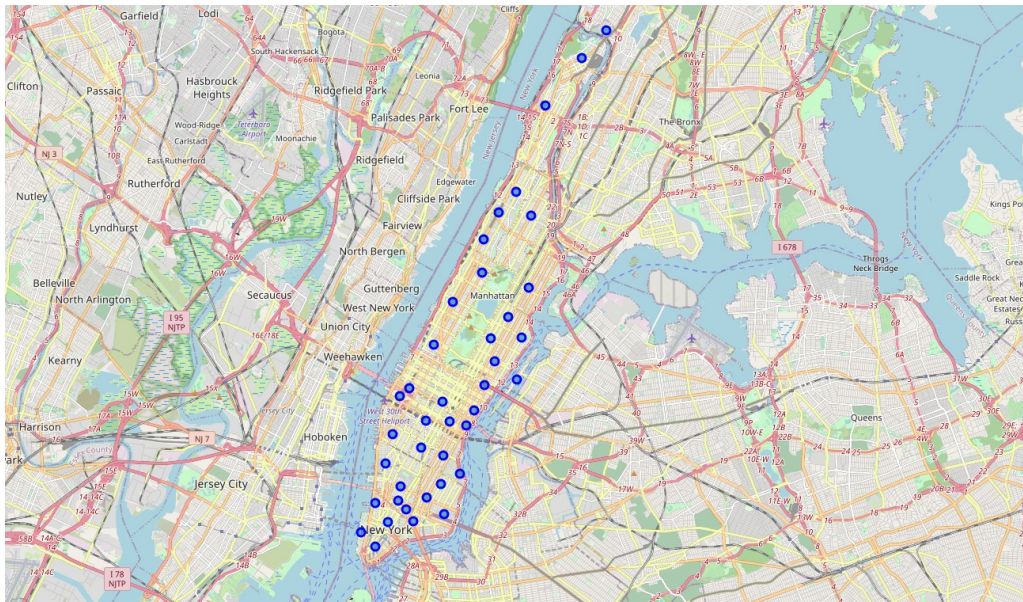
Analyze Each Neighborhood

Cluster Neighborhoods

Using 5 clusters as the number of cluster for Kmeans.

Examine Clusters

Cluster 1

	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
0	Marble Hill	Gym / Fitness Center	Yoga Studio	Boxing Gym	Gym	College Gym	Doctor's Office	Deli / Bodega	Cycle Studio	Community Center	Club House
5	Manhattanville	Gym / Fitness Center	Climbing Gym	Yoga Studio	College Gym	Gym	Doctor's Office	Deli / Bodega	Cycle Studio	Community Center	Club House
17	Chelsea	Gym / Fitness Center	Yoga Studio	Gym	Martial Arts School	Cycle Studio	Weight Loss Center	Gym Pool	Pilates Studio	Clothing Store	Climbing Gym
33	Midtown South	Gym / Fitness Center	Gym	Martial Arts School	Yoga Studio	Boxing Gym	Building	Medical Center	Chiropractor	Climbing Gym	Clothing Store
37	Stuyvesant Town	Gym / Fitness Center	Yoga Studio	Gym	College Gym	Doctor's Office	Deli / Bodega	Cycle Studio	Community Center	Club House	Gymnastics Gym
38	Flatiron	Gym / Fitness Center	Gym	Yoga Studio	Pilates Studio	Residential Building (Apartment / Condo)	Women's Store	Martial Arts School	Athletics & Sports	Pool	Doctor's Office

Cluster 2

	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
1	Chinatown	Gym / Fitness Center	Gym	Yoga Studio	Martial Arts School	Boxing Gym	Community Center	Doctor's Office	Deli / Bodega	Cycle Studio	College Gym
6	Central Harlem	Gym / Fitness Center	Gym	Martial Arts School	Cycle Studio	Yoga Studio	Gymnastics Gym	Doctor's Office	Deli / Bodega	Community Center	College Gym
9	Yorkville	Gym	Gym / Fitness Center	Gymnastics Gym	Martial Arts School	Gym Pool	Pilates Studio	Boxing Gym	Climbing Gym	Clothing Store	Club House
12	Upper West Side	Gym / Fitness Center	Gym	Yoga Studio	Gymnastics Gym	Pilates Studio	Boxing Gym	Chiropractor	Climbing Gym	Clothing Store	Club House
13	Lincoln Square	Gym / Fitness Center	Gym	Martial Arts School	Gym Pool	Cycle Studio	Residential Building (Apartment / Condo)	Yoga Studio	Climbing Gym	Pilates Studio	Clothing Store
14	Clinton	Gym / Fitness Center	Gym	Building	Chiropractor	Residential Building (Apartment / Condo)	Yoga Studio	Tennis Court	Track	Boxing Gym	Gym Pool
15	Midtown	Gym / Fitness Center	Gym	Yoga Studio	Pilates Studio	Martial Arts School	Weight Loss Center	Boxing Gym	Chiropractor	Cycle Studio	Hospital
16	Murray Hill	Gym / Fitness Center	Gym	Yoga Studio	Martial Arts School	Track	Nutritionist	Boxing Gym	Doctor's Office	Pilates Studio	Weight Loss Center
21	Tribeca	Gym / Fitness Center	Gym	Gym Pool	Yoga Studio	Pilates Studio	Cycle Studio	Gymnastics Gym	Athletics & Sports	Track	Doctor's Office
24	West Village	Gym	Gym / Fitness Center	Yoga Studio	Cycle Studio	Track	College Gym	Doctor's Office	Deli / Bodega	Community Center	Club House
25	Manhattan Valley	Gym / Fitness Center	Gym	Yoga Studio	Track	Martial Arts School	Boxing Gym	Building	Chiropractor	Climbing Gym	Clothing Store
27	Gramercy	Gym / Fitness Center	Gym	Yoga Studio	Pilates Studio	Gym Pool	Doctor's Office	Martial Arts School	Weight Loss Center	Bike Shop	Boxing Gym
29	Financial District	Gym	Gym / Fitness Center	Yoga Studio	Boxing Gym	Gym Pool	Doctor's Office	Weight Loss Center	Martial Arts School	Bike Shop	Building
30	Carnegie Hill	Gym / Fitness Center	Gym	Yoga Studio	Martial Arts School	Weight Loss Center	Pilates Studio	Gymnastics Gym	Deli / Bodega	Community Center	Gym Pool
34	Sutton Place	Gym / Fitness Center	Gym	Yoga Studio	Weight Loss Center	Pilates Studio	Martial Arts School	Cycle Studio	Spiritual Center	Doctor's Office	Chiropractor
35	Turtle Bay	Gym / Fitness Center	Gym	Martial Arts School	Residential Building (Apartment / Condo)	Gym Pool	Pilates Studio	Climbing Gym	Boxing Gym	Track	Weight Loss Center
36	Tudor City	Gym / Fitness Center	Gym	Climbing Gym	Nutritionist	Gym Pool	Yoga Studio	Boxing Gym	Weight Loss Center	Chiropractor	Building
39	Hudson Yards	Gym / Fitness Center	Gym	Building	Chiropractor	Residential Building (Apartment / Condo)	Cycle Studio	Yoga Studio	Community Center	Doctor's Office	Deli / Bodega

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	10th Most Common Venue
3	Inwood	Pilates Studio	Gym	Gym / Fitness Center	Yoga Studio	Building	Chiropractor	Climbing Gym	Clothing Store	Club House	Gymnastics Gym
7	East Harlem	Gym / Fitness Center	Martial Arts School	Yoga Studio	Boxing Gym	Building	Gym	Community Center	Doctor's Office	Deli / Bodega	Cycle Studio
8	Upper East Side	Gym / Fitness Center	Gym	Yoga Studio	Doctor's Office	Pilates Studio	Cycle Studio	Spa	Martial Arts School	Boxing Gym	Building
10	Lenox Hill	Gym / Fitness Center	Gym	Yoga Studio	Cycle Studio	Martial Arts School	Pilates Studio	Spa	Club House	Boxing Gym	Building
18	Greenwich Village	Gym / Fitness Center	Gym	Yoga Studio	Pilates Studio	Martial Arts School	Boxing Gym	Spa	Medical Center	Building	Chiropractor
19	East Village	Gym / Fitness Center	Gym	Pilates Studio	Yoga Studio	Outdoor Gym	Martial Arts School	Track	Weight Loss Center	Bike Shop	Boxing Gym
20	Lower East Side	Gym	Martial Arts School	Yoga Studio	Gym / Fitness Center	Pool	Community Center	Building	Chiropractor	Climbing Gym	Clothing Store
22	Little Italy	Gym / Fitness Center	Gym	Yoga Studio	Martial Arts School	Boxing Gym	Pilates Studio	Spa	Cycle Studio	Building	Chiropractor
23	Soho	Gym / Fitness Center	Gym	Yoga Studio	Pilates Studio	Boxing Gym	Martial Arts School	Office	Gymnastics Gym	Medical Center	Cycle Studio
26	Morningside Heights	Yoga Studio	Gym Pool	Gym	Medical Center	Park	College Gym	Gym / Fitness Center	Climbing Gym	Clothing Store	Club House
31	Noho	Gym / Fitness Center	Yoga Studio	Gym	Martial Arts School	Boxing Gym	Pilates Studio	Clothing Store	Bike Shop	Building	Chiropractor
32	Civic Center	Gym / Fitness Center	Gym	Yoga Studio	Martial Arts School	Pilates Studio	Boxing Gym	Climbing Gym	Spa	Gym Pool	Gymnastics Gym

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	10th Most Common Venue
4	Hamilton Heights	Yoga Studio	Gym	College Gym	Gym / Fitness Center	Doctor's Office	Deli / Bodega	Cycle Studio	Community Center	Club House	Gymnastics Gym

Cluster 5

	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
2	Washington Heights	Gym	Gym / Fitness Center	Pilates Studio	Gymnastics Gym	Doctor's Office	Deli / Bodega	Cycle Studio	Community Center	College Gym	Yoga Studio
11	Roosevelt Island	Gym	Gym / Fitness Center	Yoga Studio	College Gym	Doctor's Office	Deli / Bodega	Cycle Studio	Community Center	Club House	Gymnastics Gym
28	Battery Park City	Gym	Gym / Fitness Center	Boxing Gym	Gym Pool	Bike Shop	Gymnastics Gym	Community Center	Doctor's Office	Deli / Bodega	Cycle Studio

Results and Discussion

Our analysis shows that there are a large number of gyms in Manhattan, but we can find that boxing gyms are not very common. As can be seen in each cluster there are few places that offer these services, so it would be ideal to open a gym either in cluster 4, which does not have a gym of this type. Also, cluster 5, could be a good choice, because Battery Park City is the only neighborhood with a boxing gym.

Must take into account, does not suggest that those zones are really ideal areas for a modern boxing exercise center! Reason of this investigation was to as it were give information on zones near to Manhattan but not swarmed with existing boxing exercise center. Prescribed zones ought to in this manner be considered as it were as a beginning point for more point by point investigation which might in the long run result in area which has not as it were no adjacent competition but too other components taken into consideration and all other pertinent conditions met.

Conclusion

Reason of this project was to distinguish Manhattan regions near to center with moo number of boxing exercise centers in arrange to explore for an ideal location for a unused boxing exercise center. BY distinguishing clusters, we are able say that cluster 4 and 5 may well be a great choice to open a unused boxing gym.

Final decision on ideal eatery area will be made by partners based on particular characteristics of neighborhoods and areas in each suggested zone, taking into thought extra components like allure of each area, costs, social and financial elements of each neighborhood etc.

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