

Most ideal Neighbourhood in Manhattan to start a GYM

1 INTRODUCTION

1.1 Problem

This Project helps contractors to know what neighbourhood in Manhattan city is Ideal place to start a GYM.

1.2 Background

For a strategic Investment in a city there needs to be enough data points. City has many neighbourhoods. Our area of interest i.e Newyork city too has 306 neighbours. For a contractor It is very important to know what neighbourhood makes an ideal neighbourhood for him to invest in. For one to start a Gym it is important to know if the neighbourhood has enough gyms?, or is it commentionally forward.

2.DATA

2.1 Description

Neighborhood 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. We will collect the data from the spatial data repository and try to understand the neighbourhoods and the shops and establishments around it. Of 5 boroughs we will consider the Manhattan neighbourhood as it is the area of interest for the contractors and businessman.

2.2 HOW DATA IS USED TO SOLVE THE PROBLEM

Data of New York City will be segmented to analyse its neighbours. Manhattan City, which is a borough of New York City, will be considered for further analysis. Using the FOLIO and Foursquare APIs, we will try to understand the distribution of neighbourhoods and shops/establishments in the neighbourhoods of Manhattan. So that we understand the number of gyms in each neighbourhood, and neighbourhoods that do not have gyms but might have other commercial establishments.

3. METHODOLOGY

3.1 FEATURE SELECTION:

Since our Area of Interest is Manhattan data,
From the New York City data, its boroughs are identified. Those are listed as follows:

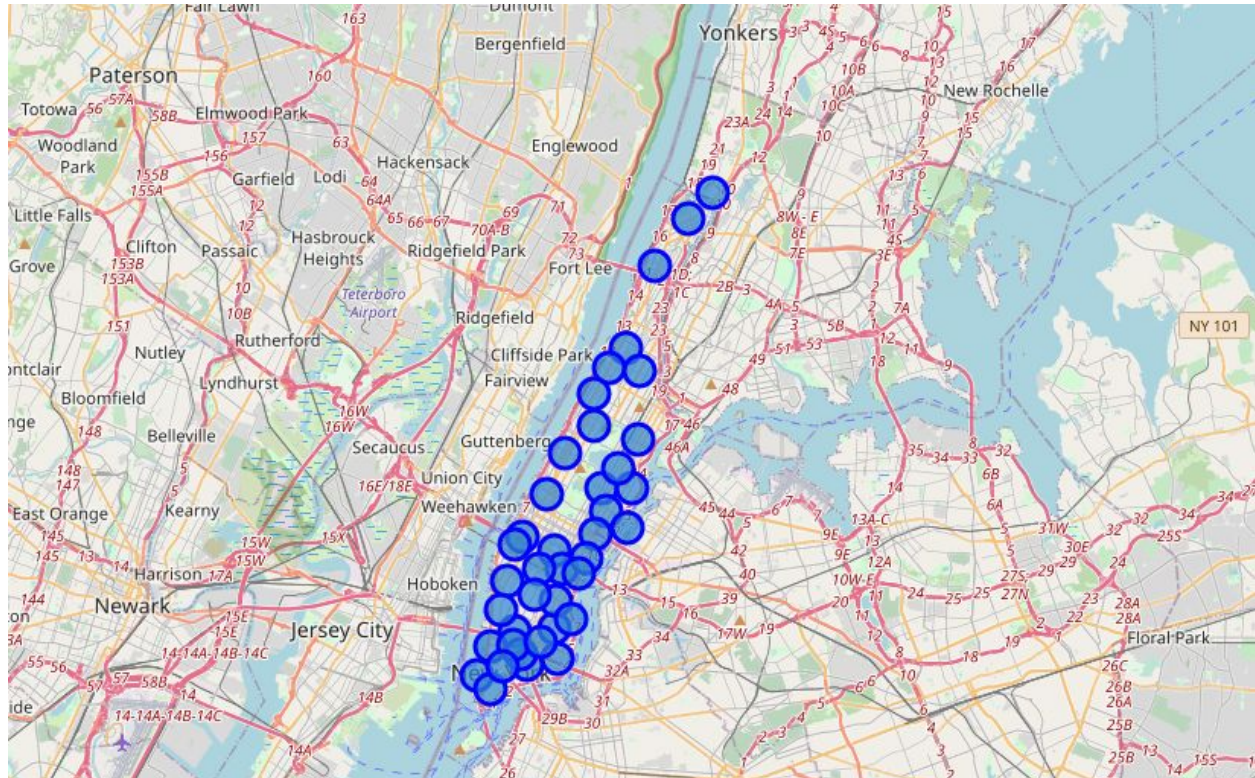
Sl no	Borough
1	Bronx
2	Manhattan
3	Brooklyn
4	Queens
5	Staten Island

No. of Neighbourhoods in Manhattan: 40

Clustering the Manhattan Neighborhood and creating the data frame:

	name	borough	x	y
0	Marble Hill	Manhattan	-73.910660	40.876551
1	Chinatown	Manhattan	-73.994279	40.715618
2	Washington Heights	Manhattan	-73.936900	40.851903
3	Inwood	Manhattan	-73.921210	40.867684
4	Hamilton Heights	Manhattan	-73.949688	40.823604

Sample Data:



The geographical coordinate of Manhattan are 40.7896239, -73.9598939.

3.2 Exploring the Neighborhoods of Manhattan:

Foursquare API was used to explore the neighborhood.

To identify the right location for the Gym, It is important to explore the neighborhoods with what kind of venues it has.

Create the venue and its category data for the Manhattan neighborhood.

	name	categories	lat	lng
0	Arturo's	Pizza Place	40.874412	-73.910271
1	Bikram Yoga	Yoga Studio	40.876844	-73.906204
2	Tibbett Diner	Diner	40.880404	-73.908937
3	Starbucks	Coffee Shop	40.877531	-73.905582
4	Dunkin'	Donut Shop	40.877136	-73.906666

Number of Venues Returned:26 .

Neighbourhoods Present in the Manhattan:

Marble Hill	Lower East Side
Chinatown	Tribeca
Washington Heights	Little Italy
Inwood	Soho
Hamilton Heights	West Village
Manhattanville	Manhattan Valley
Central Harlem	Morningside Heights
East Harlem	Gramercy
Upper East Side	Battery Park City
Yorkville	Financial District
Lenox Hill	Carnegie Hill
Roosevelt Island	Noho

Upper West Side	Civic Center
Lincoln Square	Midtown South
Clinton	Sutton Place
Midtown	Turtle Bay
Murray Hill	Tudor City
Chelsea	Stuyvesant Town
Greenwich Village	Flatiron
East Village	Hudson Yards

Size of the resulting data frame for all the venues present: (2984, 7)

Number of Venues returned for each neighborhood:

Neighborhood	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
Battery Park City	57	57	57	57	57	57
Carnegie Hill	88	88	88	88	88	88
Central Harlem	44	44	44	44	44	44
Chelsea	100	100	100	100	100	100
Chinatown	100	100	100	100	100	100
Civic Center	87	87	87	87	87	87
Clinton	100	100	100	100	100	100
East Harlem	45	45	45	45	45	45
East Village	100	100	100	100	100	100
Financial District	100	100	100	100	100	100
Flatiron	93	93	93	93	93	93
Gramercy	68	68	68	68	68	68
Greenwich Village	100	100	100	100	100	100
Hamilton Heights	61	61	61	61	61	61

Hudson Yards	53	53	53	53	53	53
Inwood	54	54	54	54	54	54
Lenox Hill	100	100	100	100	100	100
Lincoln Square	90	90	90	90	90	90
Little Italy	100	100	100	100	100	100
Lower East Side	41	41	41	41	41	41
Manhattan Valley	38	38	38	38	38	38
Manhattanville	45	45	45	45	45	45
Marble Hill	26	26	26	26	26	26
Midtown	100	100	100	100	100	100
Midtown South	87	87	87	87	87	87
Morningside Heights	39	39	39	39	39	39
Murray Hill	74	74	74	74	74	74
Noho	94	94	94	94	94	94
Roosevelt Island	30	30	30	30	30	30
Soho	71	71	71	71	71	71
Stuyvesant Town	17	17	17	17	17	17
Sutton Place	91	91	91	91	91	91
Tribeca	70	70	70	70	70	70
Tudor City	73	73	73	73	73	73
Turtle Bay	100	100	100	100	100	100
Upper East Side	88	88	88	88	88	88
Upper West Side	70	70	70	70	70	70
Washington Heights	90	90	90	90	90	90
West Village	100	100	100	100	100	100
Yorkville	100	100	100			

There are 321 Unique categories.
All together for all 40 neighbors it is 2984.

Identify the venue category which are present more than 30 in number in all neighborhoods together:

American Restaurant	60	60	60	60	60	60
Art Gallery	36	36	36	36	36	36
Bakery	62	62	62	62	62	62

Bar	46	46	46	46	46	46
Burger Joint	32	32	32	32	32	32
Café	76	76	76	76	76	76
Chinese Restaurant	45	45	45	45	45	45
Cocktail Bar	41	41	41	41	41	41
Coffee Shop	126	126	126	126	126	126
Deli / Bodega	35	35	35	35	35	35
Grocery Store	38	38	38	38	38	38
Gym	53	53	53	53	53	53
Gym / Fitness Center	63	63	63	63	63	63
Hotel	64	64	64	64	64	64
Italian Restaurant	112	112	112	112	112	112
Japanese Restaurant	43	43	43	43	43	43
Mexican Restaurant	50	50	50	50	50	50
Park	72	72	72	72	72	72
Pizza Place	79	79	79	79	79	79
Sandwich Place	42	42	42	42	42	42
Seafood Restaurant	38	38	38	38	38	38
Spa	44	44	44	44	44	44
Sushi Restaurant	38	38	38	38	38	38
Wine Bar	37	37	37	37	37	37
Wine Shop	45	45	45	45	45	45

Of 321 unique categories , 25 categories have most common places as above and locality is considered most happening if an area has at least 10 of these venues in their locality.

Number of Gym present in each neighborhood:

Neighborhood	Venue Category
Battery Park City	4
Carnegie Hill	3

Central Harlem	1
Chelsea	1
Civic Center	2
Clinton	4
East Harlem	1
Financial District	2
Flatiron	3
Greenwich Village	3
Hudson Yards	2
Lenox Hill	3
Lincoln Square	2
Marble Hill	2
Midtown	2
Murray Hill	1
Roosevelt Island	1
Soho	2
Sutton Place	2
Tudor City	2
Upper West Side	1
Washington Heights	2
West Village	2
Yorkville	5

Total Number of gyms in a neighbourhood - 53

Identifying Areas where 'Gym' is in top common venue:

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
Marble Hill	Sandwich Place	Gym	American Restaurant	Coffee Shop	Yoga Studio	Deli / Bodega	Supplement Shop	Steakhouse	Seafood Restaurant	Pizza Place

			ant							
Batter y Park City	Park	Hotel	Gym	Boat or Ferry	Memori al Site	Beer Garden	Gourme t Shop	Plaza	Food Court	Shoppin g Mall
Yorkvill e	Coffee Shop	Italian Restaurant	Gym	Bar	Deli / Bodega	Mexican Restaur ant	Sushi Restaur ant	Wine Shop	Japanes e Restaur ant	Diner
Clinton	Theater	Coffee Shop	Gym / Fitness Center	Gym	Wine Shop	Hotel	Italian Restaur ant	Sandwi ch Place	Pizza Place	Spa
Flatiro n	Gym / Fitness Center	Italian Restaurant	Park	Cosmeti cs Shop	Gym	Outdoor Sculptur e	Yoga Studio	Wine Shop	Camera Store	Japanes e Restaur ant
Soho	Italian Restaurant	Mediterrane an Restaurant	Coffee Shop	Art Gallery	Gym	Spa	Café	Clothing Store	French Restaur ant	Paper / Office Supplies Store
Green wich Village	Italian Restaurant	Coffee Shop	Café	Bakery	Sushi Restaur ant	Gym	Wine Bar	Dessert Shop	Comedy Club	Indie Movie Theater
Sutton Place	Italian Restaurant	Gym / Fitness Center	Park	Coffee Shop	Bagel Shop	Gym	Mexican Restaur ant	Latin America n Restaur ant	Hotel	Health & Beauty Service

4. RESULTS

Understanding the varied data generated and the distribution of venues in neighbourhood, And their popularity with top venues in and around, following are the Ideal venue spots for 'Gym'

Neighborhood
Central Harlem
Chelsea
East Harlem
Murray Hill
Roosevelt Island

Upper West Side

5. DISCUSSIONS AND OBSERVATIONS

- Size of the resulting data frame for all the venues present: (2984, 7)
- There are 321 Unique categories.
- All together for all 40 neighbors it is 2984.
- Of 321 unique categories , 25 categories have most common places in the locality is considered most happening if an area has at least 10 of these venues in their locality.
 - If areas have atleast below 10 venues, it is an ideal place for a Gym.
Italian Restaurant, Theatre, wine shop, Bakery, Japanese/sushi restaurant, Pizza and sandwich place, cafe, American restaurant, yoga studio, park.
- Following have most common places as above in their neighbourhood and also they already have few gyms around them,

Neighborhood
Marble Hill
Battery Park City
Yorkville
Clinton
Flatiron
Soho
Greenwich Village
Sutton Place

- Considering places from above with less that 2 gyms in it, following would be the remaining neighbourhoods for starting more Gyms.

Central Harlem
Chelsea
East Harlem
Murray Hill
Roosevelt Island
Upper West Side

6. CONCLUSION

From a Newyork city neighbourhood distribution, We selected Manhattan as an area of interest to start a Gym, and on analysing the neighbourhood with its venue categories, we understand that neighbourhoods having top ten venues as listed in observation are ideal for the Gym construction.