

The Battle of the Neighborhoods – Report

1. Introduction & Business problem:

New York City is a big city with everything you could imagine. There are a lot of different businesses in New York City and the business environment is friendly, but intense and the opportunities are endless. These things have attracted different types of people, from different cultures with different ideas. That makes New York City so exciting for businesses and bring a lot of opportunities!

Business Problem

Short version: I want to open up a vegan restaurant in Manhattan.

Long version: I've always been a big fan of food and good restaurants and I've not been a huge fan of veganism. I've grown up a lot, learned about veganism and I'm interested how the vegan restaurant business is. My idea of vegan restaurant is a restaurant with fresh ingredients, mid price and in a great location. The young generation is very interested in veganism so location is very important.

2. Data

There's two different types of data being used.

1. This one is from NYU – Spatial Data Repository
[https://geo.nyu.edu/catalog/nyu_2451_34572]

	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

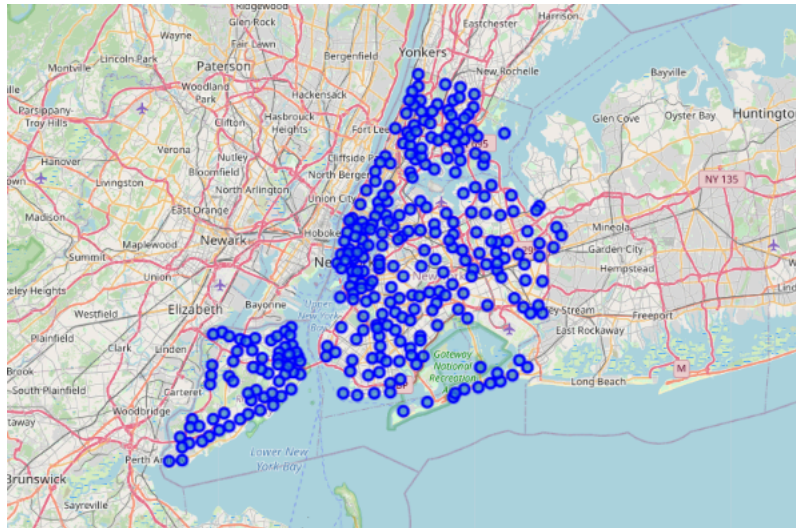
The dataframe has 5 boroughs and 306 neighborhoods.

2. The other data is taken from Foursquare API, that one is a geographical coordinates data with information about venues. The ID being used is: 4bf58dd8d48988d1d3941735 (Vegan).

3. Methodology

When learning something new I think it's important to re-use things that you've been taught and I'm using the methodology taught in week 3 lab.

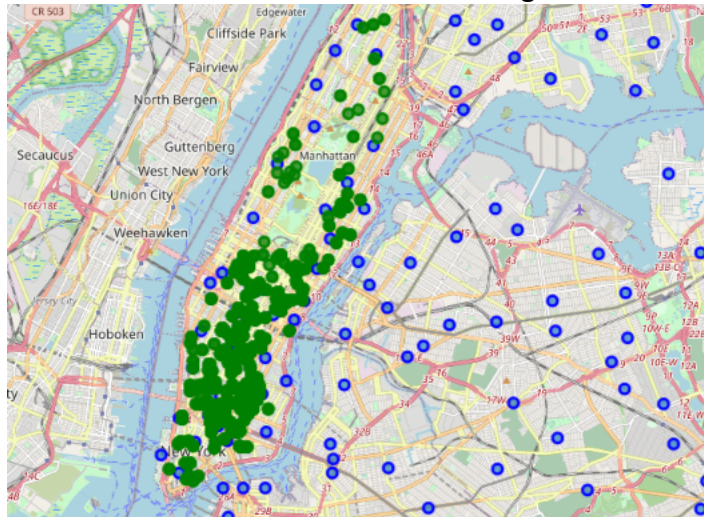
1. I start by downloading the data and converting it into a dataframe.
2. Next I like to look at the data visualized.



3. Then I access the Foursquare API to explore the neighborhoods in Manhattan.

	Neighborhood	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
0	Marble Hill	40.876551	-73.910660	Kingsbridge-Riverdale Farmers' Market	40.879973	-73.907295	Vegetarian / Vegan Restaurant
1	Chinatown	40.715618	-73.994279	Jisu Vegetarian	40.716050	-73.995348	Vegetarian / Vegan Restaurant
2	Chinatown	40.715618	-73.994279	Petisco Vegano	40.714040	-73.988815	Vegetarian / Vegan Restaurant
3	Chinatown	40.715618	-73.994279	Orchard Grocer	40.717847	-73.990358	Vegetarian / Vegan Restaurant
4	Chinatown	40.715618	-73.994279	Beyond Sushi	40.722080	-73.996250	Vegetarian / Vegan Restaurant

4. Then I like to look at it within all the neighborhoods.



5. I then analyze the neighborhoods little bit better.

	Neighborhood	American Restaurant	Asian Restaurant	Bagel Shop	Bakery	Burger Joint	Café	Coffee Shop	Deli / Bodega	Dessert Shop	Eastern European Restaurant	Falafel Restaurant	Fast Food Restaurant	Food Truck	Re
0	Battery Park City	0.000000	0.000000	0.000000	0.000000	0.071429	0.071429	0.000000	0.000000	0.000000	0.000000	0.142857	0.000000	0.071429	(
1	Carnegie Hill	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	(
2	Central Harlem	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	(
3	Chelsea	0.000000	0.026316	0.000000	0.026316	0.026316	0.052632	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.078947	(
4	Chinatown	0.000000	0.023810	0.000000	0.023810	0.000000	0.000000	0.000000	0.023810	0.023810	0.000000	0.000000	0.000000	0.023810	(
5	Civic Center	0.000000	0.028571	0.000000	0.000000	0.028571	0.028571	0.000000	0.000000	0.000000	0.000000	0.057143	0.000000	0.028571	(
6	Clinton	0.083333	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.041667	0.000000	0.000000	0.000000	0.041667	0.000000	(
7	East Harlem	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	(
8	East Village	0.020833	0.000000	0.000000	0.000000	0.020833	0.000000	0.020833	0.020833	0.020833	0.000000	0.000000	0.000000	0.000000	(
9	Financial District	0.000000	0.000000	0.000000	0.000000	0.071429	0.071429	0.000000	0.000000	0.000000	0.000000	0.142857	0.000000	0.071429	(
10	Flatiron	0.020408	0.020408	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.020408	0.000000	0.000000	0.020408	(
11	Gramercy	0.020833	0.000000	0.000000	0.020833	0.000000	0.020833	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.041667	(
12	Greenwich Village	0.020833	0.000000	0.000000	0.041667	0.000000	0.000000	0.000000	0.020833	0.000000	0.000000	0.000000	0.000000	0.020833	(
13	Hamilton Heights	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	(
14	Hudson Yards	0.076923	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.076923	0.000000	0.000000	0.000000	0.076923	0.000000	(
15	Lenox Hill	0.000000	0.000000	0.058824	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.058824	0.000000	0.000000	(

	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	Battery Park City	Vegetarian / Vegan Restaurant	Salad Place	Falafel Restaurant	Juice Bar	Burger Joint	Café	Food Truck	Eastern European Restaurant	Grocery Store	Gluten-free Restaurant
1	Carnegie Hill	Vegetarian / Vegan Restaurant	Grocery Store	Juice Bar	Ice Cream Shop	Gluten-free Restaurant	Food Truck	Fast Food Restaurant	Falafel Restaurant	Eastern European Restaurant	Dessert Shop
2	Central Harlem	Vegetarian / Vegan Restaurant	Market	Ice Cream Shop	Grocery Store	Gluten-free Restaurant	Food Truck	Fast Food Restaurant	Falafel Restaurant	Eastern European Restaurant	Dessert Shop
3	Chelsea	Vegetarian / Vegan Restaurant	Food Truck	Salad Place	Juice Bar	Café	Bakery	Burger Joint	New American Restaurant	Mexican Restaurant	Mediterranean Restaurant
4	Chinatown	Vegetarian / Vegan Restaurant	Juice Bar	Pizza Place	Mediterranean Restaurant	Food Truck	Japanese Restaurant	Dessert Shop	Latin American Restaurant	Deli / Bodega	Grocery Store

6. With these informations I cluster the neighborhoods together and use KMeans.

	Borough	Neighborhood	Latitude	Longitude	Cluster Labels	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	Manhattan	Marble Hill	40.876551	-73.910660	4.0	Vegetarian / Vegan Restaurant	Thai Restaurant	Health Food Store	Grocery Store	Gluten-free Restaurant	Food Truck	Fast Food Restaurant	Falafel Restaurant	Eastern European Restaurant	
1	Manhattan	Chinatown	40.715618	-73.994279	3.0	Vegetarian / Vegan Restaurant	Juice Bar	Pizza Place	Mediterranean Restaurant	Food Truck	Japanese Restaurant	Dessert Shop	Latin American Restaurant	Deli / Bodega	
2	Manhattan	Washington Heights	40.851903	-73.936900	2.0	Lounge	Vegetarian / Vegan Restaurant	Ice Cream Shop	Grocery Store	Gluten-free Restaurant	Food Truck	Fast Food Restaurant	Falafel Restaurant	Eastern European Restaurant	
3	Manhattan	Inwood	40.867684	-73.921210	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	
4	Manhattan	Hamilton Heights	40.823604	-73.949688	4.0	Vegetarian / Vegan Restaurant	Thai Restaurant	Health Food Store	Grocery Store	Gluten-free Restaurant	Food Truck	Fast Food Restaurant	Falafel Restaurant	Eastern European Restaurant	

7. Then I created Map to see the clusters visualized.



4. Results

Clusters:

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
12	Upper West Side	Vegetarian / Vegan Restaurant	Sandwich Place	Salad Place	Food Truck	Juice Bar	Health Food Store	Dessert Shop	Gluten-free Restaurant	Fast Food Restaurant	Falafel Restaurant
16	Murray Hill	Vegetarian / Vegan Restaurant	Salad Place	Juice Bar	New American Restaurant	Indian Restaurant	American Restaurant	Japanese Restaurant	Kosher Restaurant	Eastern European Restaurant	Fast Food Restaurant
17	Chelsea	Vegetarian / Vegan Restaurant	Food Truck	Salad Place	Juice Bar	Café	Bakery	Burger Joint	New American Restaurant	Mexican Restaurant	Mediterranean Restaurant
21	Tribeca	Vegetarian / Vegan Restaurant	Juice Bar	Salad Place	Falafel Restaurant	Café	Food Truck	Deli / Bodega	Mediterranean Restaurant	Burger Joint	Bakery
24	West Village	Vegetarian / Vegan Restaurant	Juice Bar	Salad Place	Asian Restaurant	Bakery	Burger Joint	Café	Deli / Bodega	Food Truck	Gluten-free Restaurant
28	Battery Park City	Vegetarian / Vegan Restaurant	Salad Place	Falafel Restaurant	Juice Bar	Burger Joint	Café	Food Truck	Eastern European Restaurant	Grocery Store	Gluten-free Restaurant
29	Financial District	Vegetarian / Vegan Restaurant	Falafel Restaurant	Salad Place	Juice Bar	Burger Joint	Café	Food Truck	Eastern European Restaurant	Grocery Store	Gluten-free Restaurant
33	Midtown South	Vegetarian / Vegan Restaurant	Juice Bar	Food Truck	Indian Restaurant	Salad Place	New American Restaurant	Japanese Restaurant	American Restaurant	Mexican Restaurant	Deli / Bodega
36	Tudor City	Vegetarian / Vegan Restaurant	Indian Restaurant	Salad Place	New American Restaurant	Sushi Restaurant	Food Truck	Japanese Restaurant	Juice Bar	Dessert Shop	Fast Food Restaurant
38	Flatiron	Vegetarian / Vegan Restaurant	Salad Place	Juice Bar	New American Restaurant	Indian Restaurant	Health Food Store	Sushi Restaurant	Asian Restaurant	Eastern European Restaurant	Food Truck
39	Hudson Yards	Vegetarian / Vegan Restaurant	Juice Bar	Mexican Restaurant	Deli / Bodega	Fast Food Restaurant	American Restaurant	Salad Place	Pizza Place	Gluten-free Restaurant	Asian Restaurant

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
6	Central Harlem	Vegetarian / Vegan Restaurant	Market	Ice Cream Shop	Grocery Store	Gluten-free Restaurant	Food Truck	Fast Food Restaurant	Falafel Restaurant	Eastern European Restaurant	Dessert Shop
9	Yorkville	Vegetarian / Vegan Restaurant	Grocery Store	Juice Bar	Ice Cream Shop	Gluten-free Restaurant	Food Truck	Fast Food Restaurant	Falafel Restaurant	Eastern European Restaurant	Dessert Shop
11	Roosevelt Island	Vegetarian / Vegan Restaurant	Salad Place	Dessert Shop	Grocery Store	Gluten-free Restaurant	Food Truck	Fast Food Restaurant	Falafel Restaurant	Eastern European Restaurant	Deli / Bodega
13	Lincoln Square	Vegetarian / Vegan Restaurant	Italian Restaurant	Salad Place	Dessert Shop	Grocery Store	Gluten-free Restaurant	Food Truck	Fast Food Restaurant	Falafel Restaurant	Eastern European Restaurant
20	Lower East Side	Vegetarian / Vegan Restaurant	Pizza Place	Mexican Restaurant	Japanese Restaurant	Juice Bar	Latin American Restaurant	Dessert Shop	Mac & Cheese Joint	Deli / Bodega	Burger Joint
30	Carnegie Hill	Vegetarian / Vegan Restaurant	Grocery Store	Juice Bar	Ice Cream Shop	Gluten-free Restaurant	Food Truck	Fast Food Restaurant	Falafel Restaurant	Eastern European Restaurant	Dessert Shop
31	Noho	Vegetarian / Vegan Restaurant	Juice Bar	Pizza Place	Food Truck	Salad Place	Bakery	Burger Joint	Mexican Restaurant	Grocery Store	Mac & Cheese Joint
34	Sutton Place	Vegetarian / Vegan Restaurant	Salad Place	Bagel Shop	New American Restaurant	Latin American Restaurant	Dessert Shop	Gluten-free Restaurant	Food Truck	Fast Food Restaurant	Falafel Restaurant
37	Stuyvesant Town	Vegetarian / Vegan Restaurant	Grocery Store	Mac & Cheese Joint	Ice Cream Shop	Gluten-free Restaurant	Food Truck	Fast Food Restaurant	Falafel Restaurant	Eastern European Restaurant	Dessert Shop

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
2	Washington Heights	Lounge	Vegetarian / Vegan Restaurant	Ice Cream Shop	Grocery Store	Gluten-free Restaurant	Food Truck	Fast Food Restaurant	Falafel Restaurant	Eastern European Restaurant	Dessert Shop

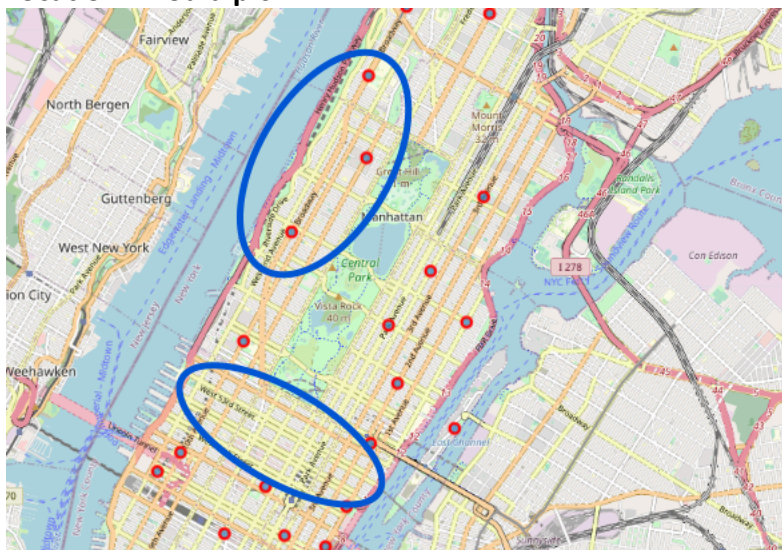
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1	Chinatown	Vegetarian / Vegan Restaurant	Juice Bar	Pizza Place	Mediterranean Restaurant	Food Truck	Japanese Restaurant	Dessert Shop	Latin American Restaurant	Deli / Bodega	Grocery Store
8	Upper East Side	Vegetarian / Vegan Restaurant	Grocery Store	Salad Place	Juice Bar	Falafel Restaurant	Dessert Shop	Gluten-free Restaurant	Food Truck	Fast Food Restaurant	Eastern European Restaurant
10	Lenox Hill	Vegetarian / Vegan Restaurant	Salad Place	Bagel Shop	Juice Bar	Latin American Restaurant	Falafel Restaurant	Eastern European Restaurant	Gluten-free Restaurant	Food Truck	Fast Food Restaurant
14	Clinton	Vegetarian / Vegan Restaurant	Juice Bar	American Restaurant	Deli / Bodega	Restaurant	Salad Place	Mexican Restaurant	Fast Food Restaurant	Sandwich Place	Food Truck
15	Midtown	Vegetarian / Vegan Restaurant	Juice Bar	Salad Place	New American Restaurant	Japanese Restaurant	American Restaurant	Indian Restaurant	Kosher Restaurant	Deli / Bodega	Eastern European Restaurant
18	Greenwich Village	Vegetarian / Vegan Restaurant	Salad Place	Juice Bar	Bakery	Pizza Place	Latin American Restaurant	Deli / Bodega	Food Truck	Gluten-free Restaurant	Grocery Store
19	East Village	Vegetarian / Vegan Restaurant	Pizza Place	Juice Bar	Mac & Cheese Joint	Burger Joint	Coffee Shop	Deli / Bodega	Dessert Shop	Thai Restaurant	Japanese Restaurant
22	Little Italy	Vegetarian / Vegan Restaurant	Juice Bar	Salad Place	Pizza Place	Grocery Store	Falafel Restaurant	Latin American Restaurant	Dessert Shop	Deli / Bodega	Coffee Shop
23	Soho	Vegetarian / Vegan Restaurant	Juice Bar	Salad Place	Bakery	Deli / Bodega	Pizza Place	Burger Joint	Café	Coffee Shop	Latin American Restaurant
25	Manhattan Valley	Vegetarian / Vegan Restaurant	Sandwich Place	Health Food Store	Asian Restaurant	Bagel Shop	Bakery	Burger Joint	Café	Coffee Shop	Ice Cream Shop
27	Gramercy	Vegetarian / Vegan Restaurant	Salad Place	New American Restaurant	Food Truck	Juice Bar	Indian Restaurant	Grocery Store	Thai Restaurant	Bakery	Café
32	Civic Center	Vegetarian / Vegan Restaurant	Salad Place	Juice Bar	Falafel Restaurant	Café	Food Truck	Mediterranean Restaurant	Burger Joint	Asian Restaurant	Grocery Store
35	Turtle Bay	Vegetarian / Vegan Restaurant	Salad Place	New American Restaurant	Japanese Restaurant	Juice Bar	Latin American Restaurant	Indian Restaurant	Pizza Place	Gluten-free Restaurant	Asian Restaurant

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
0	Marble Hill	Vegetarian / Vegan Restaurant	Thai Restaurant	Health Food Store	Grocery Store	Gluten-free Restaurant	Food Truck	Fast Food Restaurant	Falafel Restaurant	Eastern European Restaurant	Dessert Shop
4	Hamilton Heights	Vegetarian / Vegan Restaurant	Thai Restaurant	Health Food Store	Grocery Store	Gluten-free Restaurant	Food Truck	Fast Food Restaurant	Falafel Restaurant	Eastern European Restaurant	Dessert Shop
5	Manhattanville	Vegetarian / Vegan Restaurant	Thai Restaurant	Health Food Store	Grocery Store	Gluten-free Restaurant	Food Truck	Fast Food Restaurant	Falafel Restaurant	Eastern European Restaurant	Dessert Shop
7	East Harlem	Vegetarian / Vegan Restaurant	Thai Restaurant	Health Food Store	Grocery Store	Gluten-free Restaurant	Food Truck	Fast Food Restaurant	Falafel Restaurant	Eastern European Restaurant	Dessert Shop
26	Morningside Heights	Vegetarian / Vegan Restaurant	Thai Restaurant	Health Food Store	Grocery Store	Gluten-free Restaurant	Food Truck	Fast Food Restaurant	Falafel Restaurant	Eastern European Restaurant	Dessert Shop

5.

Location I would pick:

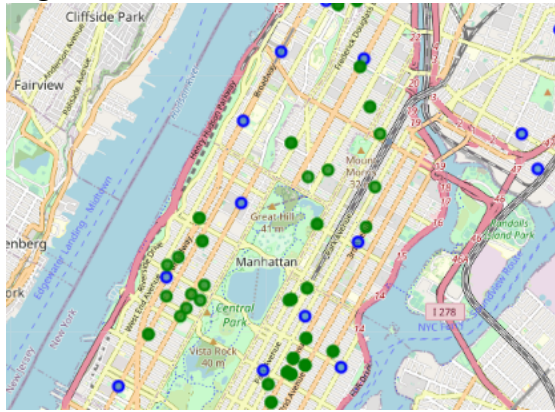


5. Discussion

The data I was working with was limited and therefore could the result be different with better data. By using more data we could use this methodology and choose right location for vegan restaurant.

The Lower Manhattan is very busy and risky to go into the competition, but at the same time, there is more traffic there.

The location I chose was because there are few stores and restaurants that serve vegan food.



Using Foursquare was a great fun and good to get to know it little bit better.

6. Conclusion

This project was a lot of fun and helped me understanding a lot of things better.

There is still definitely room for improvement. That's the best thing about learning.

My goal after this IBM specialization is to grow my Data Science skill, use it in my work and as a hobby try to use basketball stats to help analyzing opponents in Icelandic basketball league.