



Battle of Neighborhoods in NYC

By Ethan Kurz



Background

- A restaurateur is interested in opening up a world class restaurant in New York.
- Why New York?
 - Cultural Diversity
 - Access to Global Clients
- Issue: Location



Problem

- Where can the restaurateur open a world class restaurant with an impact felt immediately?
- Where will the restaurateur have competition but still have access to the bustle and diversity of New York?
- These questions are important questions because a restaurant wants to be visible to the world and surrounded by competition they can compete with.
- Putting a new restaurant in an area known for restaurants will make them immediately popular and boost their reputation quickly.



Data

- Sources
 - Coursera Course
 - Foursquare API

	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
5	Bronx	Kingsbridge	40.881687	-73.902818
6	Manhattan	Marble Hill	40.876551	-73.910660
7	Bronx	Woodlawn	40.898273	-73.867315
8	Bronx	Nonwood	40.877224	-73.879391
9	Bronx	Williamsbridge	40.881039	-73.857446
10	Bronx	Baychester	40.866858	-73.835798
11	Bronx	Pelham Parkway	40.857413	-73.854756
12	Bronx	City Island	40.847247	-73.786488
13	Bronx	Bedford Park	40.870185	-73.885512
14	Bronx	University Heights	40.855727	-73.910416
15	Bronx	Morris Heights	40.847898	-73.919672
16	Bronx	Fordham	40.860997	-73.896427
17	Bronx	East Tremont	40.842696	-73.887356

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print(restaurants.shape)
restaurants.head(20)
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(16704, 7)

	Neighborhood	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
0	Wakefield	40.894705	-73.847201	Cooler Runnings Jamaican Restaurant Inc	40.898276	-73.850381	Caribbean Restaurant
1	Wakefield	40.894705	-73.847201	Dunkin'	40.890459	-73.849089	Donut Shop
2	Wakefield	40.894705	-73.847201	SUBWAY	40.890656	-73.849192	Sandwich Place
3	Wakefield	40.894705	-73.847201	Pitman Deli	40.894149	-73.845748	Food
4	Wakefield	40.894705	-73.847201	Baychester Avenue Food Truck	40.892293	-73.843230	Food Truck
5	Wakefield	40.894705	-73.847201	Louis Pizza	40.898457	-73.848770	Pizza Place
6	Co-op City	40.874294	-73.829939	Capri II Pizza	40.876374	-73.829940	Pizza Place
7	Co-op City	40.874294	-73.829939	Arby's	40.870518	-73.828657	Fast Food Restaurant
8	Co-op City	40.874294	-73.829939	Townhouse Restaurant	40.876086	-73.828868	Restaurant
9	Co-op City	40.874294	-73.829939	Quality Market	40.875801	-73.828175	Food
10	Co-op City	40.874294	-73.829939	Guang Hui Chinese Restaurant	40.876603	-73.829710	Chinese Restaurant
11	Co-op City	40.874294	-73.829939	Kennedy Fried Chicken & Pizza	40.876655	-73.829767	Fried Chicken Joint
12	Co-op City	40.874294	-73.829939	Kennedy's	40.876807	-73.829627	Fast Food Restaurant
13	Co-op City	40.874294	-73.829939	Capri Deli	40.870285	-73.828602	Deli / Bodega
14	Co-op City	40.874294	-73.829939	Seven Seas	40.870164	-73.828906	Restaurant
15	Co-op City	40.874294	-73.829939	Bartow Pizza	40.870029	-73.828923	Pizza Place
16	Eastchester	40.887556	-73.827806	Fish & Ting	40.885539	-73.829151	Caribbean Restaurant
17	Eastchester	40.887556	-73.827806	Cozy Cottage Restaurant	40.886332	-73.827616	Diner

Data

- Pre-Processing
 - One-hot encoding

	Neighborhood	Afghan Restaurant	African Restaurant	American Restaurant	Arepa Restaurant	Argentinian Restaurant	Asian Restaurant	Australian Restaurant	Austrian Restaurant	BBQ Joint	Bagel Shop	Bakery	Belgian Restaurant	Bistro	Brazilian Restaurant	Breakfast Spot	E
0	Wakefield	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1	Wakefield	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2	Wakefield	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
3	Wakefield	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4	Wakefield	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

- Popularity

	Neighborhood	Count
0	Murray Hill	93
1	Chinatown	78
2	West Village	74
3	Greenwich Village	73
4	East Village	73
5	Flatiron	70
6	Soho	68
7	Noho	68
8	Little Italy	67
9	South Side	65

	----Murray Hill----	
	venue	freq
0	Korean Restaurant	0.19
1	Japanese Restaurant	0.06
2	American Restaurant	0.04
3	Italian Restaurant	0.03
4	Sushi Restaurant	0.03

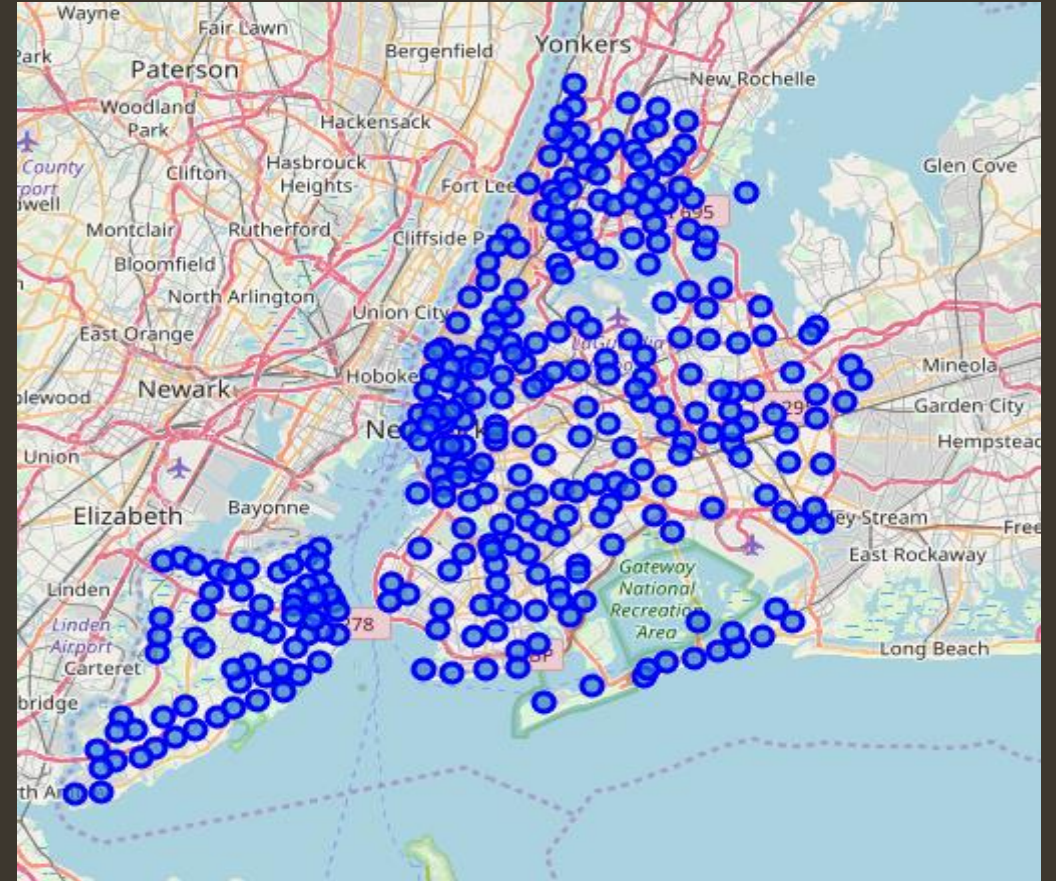
Methodology and Analysis

- K-Means clustering algorithm
- List of top venues per neighborhood

	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	Wakefield	Caribbean Restaurant	Vietnamese Restaurant	Hawaiian Restaurant	Ethiopian Restaurant	Falafel Restaurant	Fast Food Restaurant	Filipino Restaurant	French Restaurant	German Restaurant
1	Co-op City	Restaurant	Fast Food Restaurant	Chinese Restaurant	Vietnamese Restaurant	Hawaiian Restaurant	Falafel Restaurant	Filipino Restaurant	French Restaurant	German Restaurant
2	Eastchester	Caribbean Restaurant	Seafood Restaurant	Fast Food Restaurant	Chinese Restaurant	Vietnamese Restaurant	English Restaurant	Falafel Restaurant	Filipino Restaurant	French Restaurant
3	Riverdale	Vietnamese Restaurant	Empanada Restaurant	Ethiopian Restaurant	Falafel Restaurant	Fast Food Restaurant	Filipino Restaurant	French Restaurant	German Restaurant	Gluten-free Restaurant
4	Kingsbridge	Chinese Restaurant	Latin American Restaurant	Mexican Restaurant	Spanish Restaurant	Restaurant	Vegetarian / Vegan Restaurant	Seafood Restaurant	Fast Food Restaurant	Caribbean Restaurant
5	Marble Hill	Seafood Restaurant	American Restaurant	Vietnamese Restaurant	Hawaiian Restaurant	Ethiopian Restaurant	Falafel Restaurant	Fast Food Restaurant	Filipino Restaurant	French Restaurant
7	Norwood	Chinese Restaurant	American Restaurant	Mexican Restaurant	Fast Food Restaurant	Spanish Restaurant	Restaurant	Caribbean Restaurant	Vietnamese Restaurant	Falafel Restaurant
9	Baychester	American Restaurant	Fast Food Restaurant	Mexican Restaurant	Spanish Restaurant	Vietnamese Restaurant	Hawaiian Restaurant	Ethiopian Restaurant	Falafel Restaurant	Filipino Restaurant
12	Bedford Park	Mexican Restaurant	Chinese Restaurant	Spanish Restaurant	Fast Food Restaurant	Vietnamese Restaurant	Halal Restaurant	Ethiopian Restaurant	Falafel Restaurant	Filipino Restaurant
13	University Heights	Chinese Restaurant	Fast Food Restaurant	African Restaurant	Latin American Restaurant	Restaurant	Vietnamese Restaurant	Hawaiian Restaurant	Falafel Restaurant	Filipino Restaurant
14	Morris Heights	Spanish Restaurant	Chinese Restaurant	Latin American Restaurant	Vietnamese Restaurant	Halal Restaurant	Ethiopian Restaurant	Falafel Restaurant	Fast Food Restaurant	Filipino Restaurant
15	Fordham	Fast Food Restaurant	Chinese Restaurant	Spanish Restaurant	Mexican Restaurant	Restaurant	American Restaurant	Latin American Restaurant	Seafood Restaurant	Greek Restaurant
16	East Tremont	Chinese Restaurant	Fast Food Restaurant	Latin American Restaurant	Asian Restaurant	Mexican Restaurant	Paella Restaurant	Restaurant	Spanish Restaurant	Vietnamese Restaurant
17	West Farms	Latin American Restaurant	Fast Food Restaurant	Chinese Restaurant	Vietnamese Restaurant	Himalayan Restaurant	Falafel Restaurant	Filipino Restaurant	French Restaurant	German Restaurant
18	High Bridge	Chinese Restaurant	Latin American Restaurant	Seafood Restaurant	Italian Restaurant	Restaurant	Asian Restaurant	Spanish Restaurant	Mexican Restaurant	German Restaurant
19	Melrose	Chinese Restaurant	American Restaurant	Mexican Restaurant	Spanish Restaurant	Vietnamese Restaurant	Hawaiian Restaurant	Falafel Restaurant	Fast Food Restaurant	Filipino Restaurant
20	Mott Haven	Spanish Restaurant	Chinese Restaurant	Restaurant	Latin American Restaurant	Fast Food Restaurant	Peruvian Restaurant	Greek Restaurant	Ethiopian Restaurant	Falafel Restaurant
21	Port Morris	Latin American Restaurant	Restaurant	Peruvian Restaurant	Spanish Restaurant	Chinese Restaurant	Greek Restaurant	Ethiopian Restaurant	Falafel Restaurant	Fast Food Restaurant
22	Longwood	Fast Food Restaurant	Latin American Restaurant	Chinese Restaurant	Vietnamese Restaurant	Himalayan Restaurant	Falafel Restaurant	Filipino Restaurant	French Restaurant	German Restaurant
23	Hunts Point	Spanish Restaurant	Restaurant	Seafood Restaurant	Empanada Restaurant	English Restaurant	Ethiopian Restaurant	Falafel Restaurant	Fast Food Restaurant	Filipino Restaurant

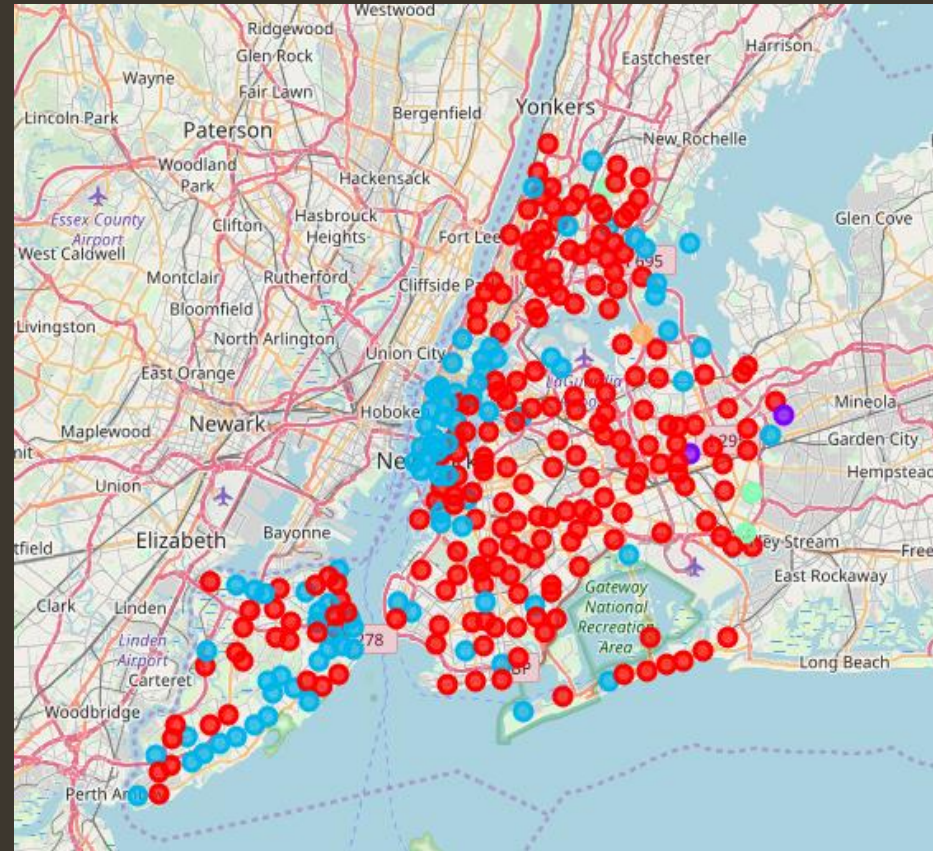
Data Visualization

- Map of all the neighborhoods in NYC



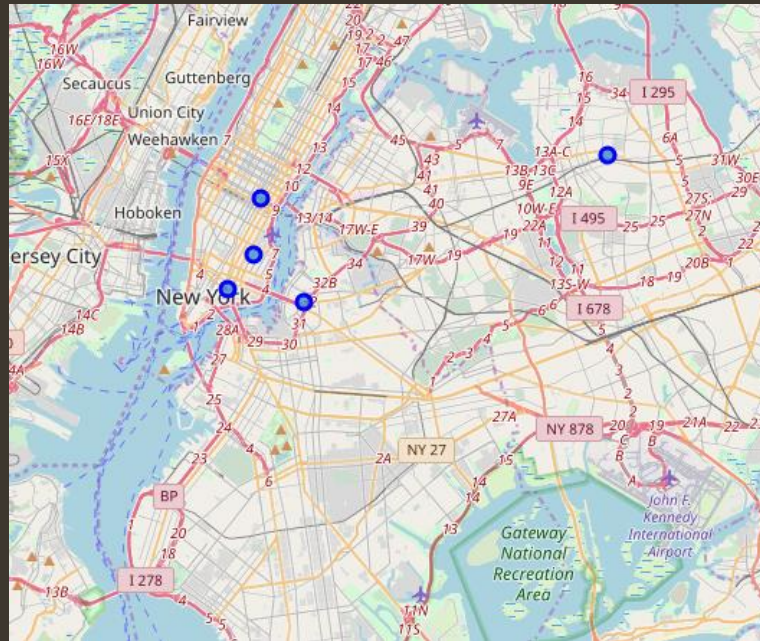
Data Visualization

- K-Means Clustering
 - Red dots are cluster 0



Data Visualization

- Cross referencing with the 10 neighborhoods with most restaurants



Result and Discussion

- There are several results from my data analysis.
 - Neighborhoods with the most restaurants are: Murray Hill, Chinatown, West Village, Greenwich Village, East Village, Flatiron, Soho, Noho, Little Italy, and South Side.
 - 4 of these neighborhoods are in cluster 0: Murray Hill, Chinatown, East Village, and South Side.
 - These locations already ring a bell to the reader as locations of popular and successful restaurants.
 - The most popular restaurants in these neighborhoods are Chinese Restaurant, Korean Restaurant, Vietnamese Restaurant, Mexican Restaurant, Italian Restaurant, and American Restaurant (in order of most popular to least popular).

Conclusion

- Establish Asian style restaurant in Murray Hill
- Murray Hill is populated by recent college grads and young professional so the conclusion makes senses for a location for a new successful restaurant.

