

City Clusters : A comparison of two major North American Cities

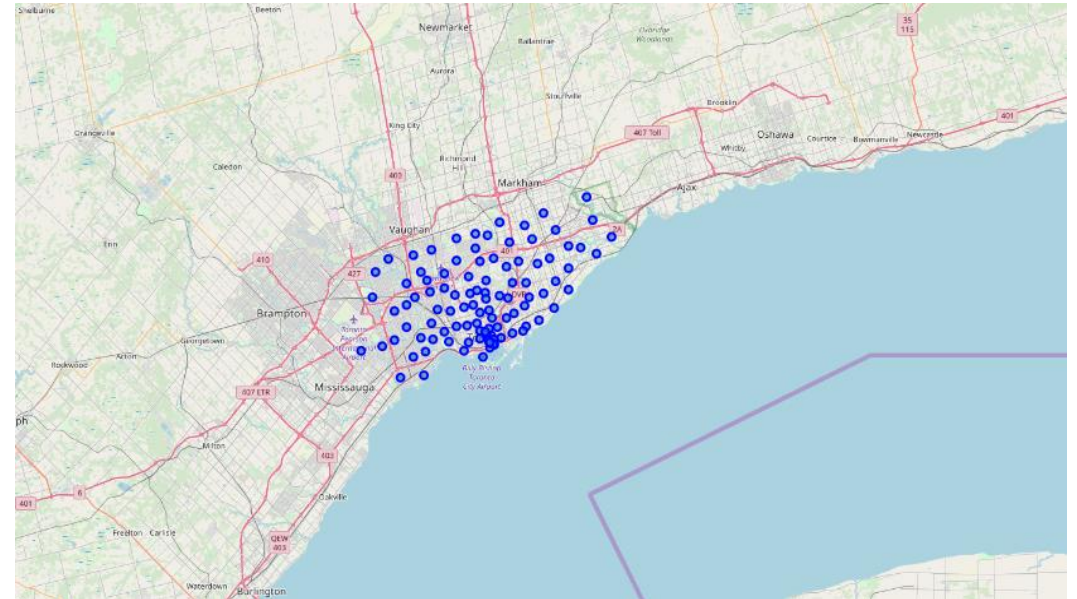
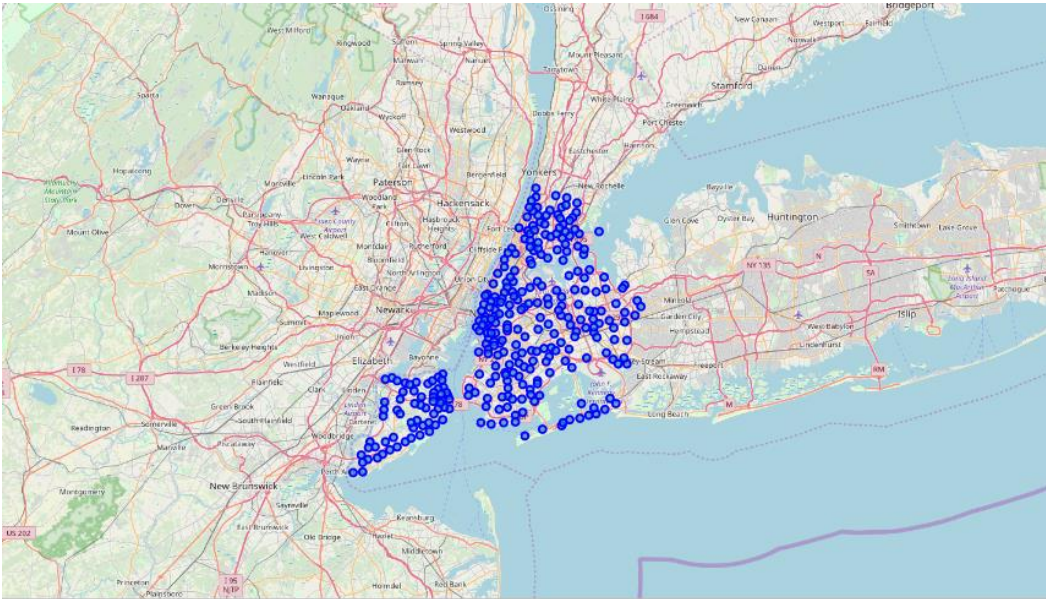
IBM Course: Applied Data Science Capstone Project

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Outline

- Introduction
- Data
- Methodology
- Results



Introduction

- We are going to look at the venues that characterize the most the different types of neighborhoods in each one of the cities : Toronto & Manhattan.
- We can for example identify business areas by the type of facilities, or even more residential parts of the city by looking at the type of buildings and shops available.
- What makes a certain part of the city more attractive than an other ?

Data

- The .json file that can be found here : https://cocl.us/new_york_dataset

	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 scraped table that can be found here : [https://en.wikipedia.org/wiki/List_of_postal_codes_of_Canada: M](https://en.wikipedia.org/wiki/List_of_postal_codes_of_Canada:_M)

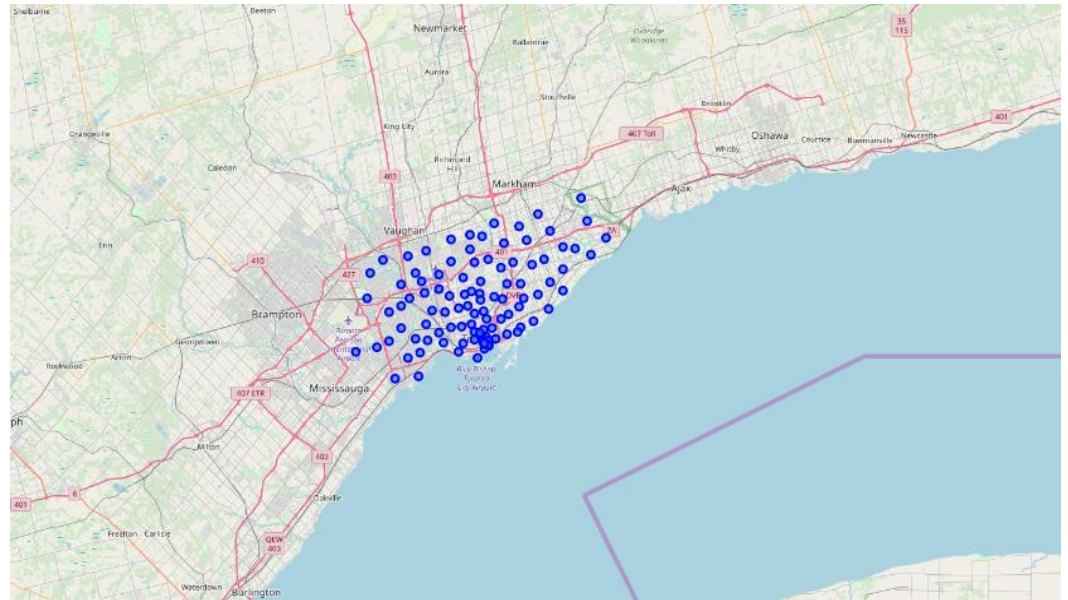
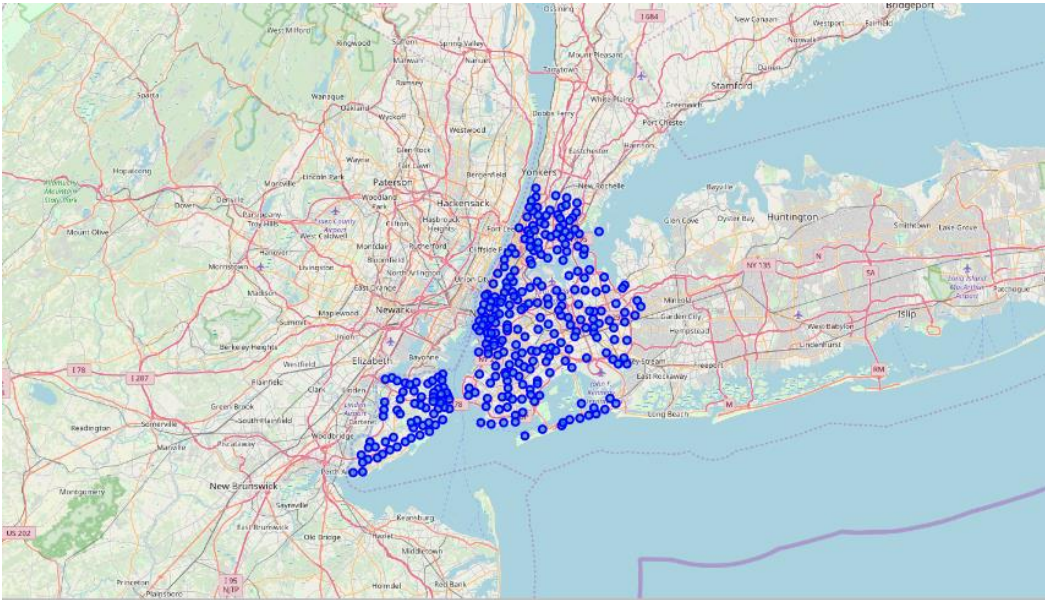
Data

- The scraped table that can be found here :
[https://en.wikipedia.org/wiki/List_of_postal_codes_of_Canada: M](https://en.wikipedia.org/wiki/List_of_postal_codes_of_Canada:_M)

Postcode ↕	Borough ↕	Neighbourhood ↕
M1A	Not assigned	Not assigned
M2A	Not assigned	Not assigned
M3A	North York	Parkwoods
M4A	North York	Victoria Village
M5A	Downtown Toronto	Harbourfront
M5A	Downtown Toronto	Regent Park
M6A	North York	Lawrence Heights
M6A	North York	Lawrence Manor
M7A	Queen's Park	Not assigned
M8A	Not assigned	Not assigned
M9A	Etobicoke	Islington Avenue

Methodology

- First of all, we are going to visualize each neighborhood of New York City and Toronto on a map using the map function of the Folium Python Library :



Methodology

- We are going to explore each neighborhood of Manhattan and Toronto, and by exploring, we mean, find out the venues in each neighborhood, with the radius of 500m.
- And in order to do that, we are going to need to connect to The FOURSQUARE API and retrieve the venues :
- Manhattan :

	Neighborhood	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
0	Marble Hill	40.876551	-73.91066	Arturo's	40.874412	-73.910271	Pizza Place
1	Marble Hill	40.876551	-73.91066	Bikram Yoga	40.876844	-73.906204	Yoga Studio
2	Marble Hill	40.876551	-73.91066	Tibbett Diner	40.880404	-73.908937	Diner
3	Marble Hill	40.876551	-73.91066	Dunkin' Donuts	40.877136	-73.906666	Donut Shop
4	Marble Hill	40.876551	-73.91066	Starbucks	40.877531	-73.905582	Coffee Shop

- Toronto :

	Neighborhood	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
0	Rouge, Malvern	43.806686	-79.194353	Wendy's	43.807448	-79.199056	Fast Food Restaurant
1	Rouge, Malvern	43.806686	-79.194353	Interprovincial Group	43.805630	-79.200378	Print Shop
2	Highland Creek, Rouge Hill, Port Union	43.784535	-79.160497	Chris Effects Painting	43.784343	-79.163742	Construction & Landscaping
3	Highland Creek, Rouge Hill, Port Union	43.784535	-79.160497	Royal Canadian Legion	43.782533	-79.163085	Bar
4	Guildwood, Morningside, West Hill	43.763573	-79.188711	Swiss Chalet Rotisserie & Grill	43.767697	-79.189914	Pizza Place

Methodology

- Venue Popularity : Manhattan

	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	Park	Coffee Shop	Hotel	Gym	Food Truck	Italian Restaurant	Wine Shop	Sandwich Place	Clothing Store	Food Court
1	Carnegie Hill	Pizza Place	Café	Coffee Shop	Cosmetics Shop	Yoga Studio	Spa	Japanese Restaurant	Gym	French Restaurant	Bookstore
2	Central Harlem	African Restaurant	Chinese Restaurant	American Restaurant	French Restaurant	Gym / Fitness Center	Seafood Restaurant	Cosmetics Shop	Dessert Shop	Event Space	Library
3	Chelsea	Coffee Shop	Italian Restaurant	Ice Cream Shop	American Restaurant	Nightclub	Bakery	Seafood Restaurant	Hotel	Theater	Cupcake Shop
4	Chinatown	Chinese Restaurant	Dim Sum Restaurant	Bubble Tea Shop	American Restaurant	Cocktail Bar	Hotpot Restaurant	Salon / Barbershop	Bakery	Noodle House	Vietnamese Restaurant

Methodology

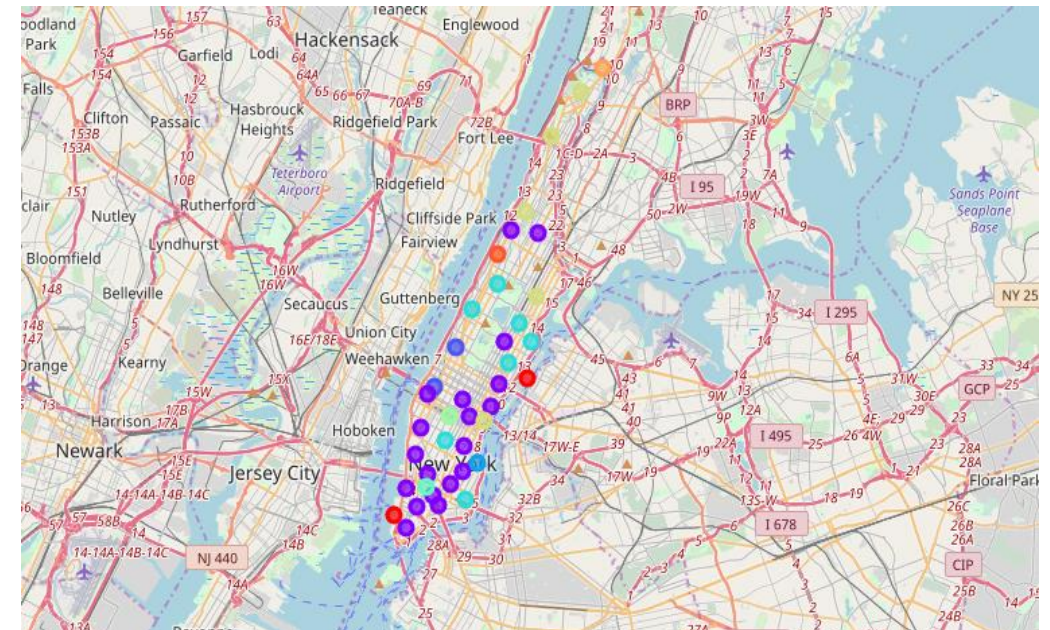
- Venue Popularity : Manhattan

	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	Adelaide, King, Richmond	Coffee Shop	Steakhouse	Café	Thai Restaurant	Hotel	Bar	Sushi Restaurant	Bakery	American Restaurant	Burger Joint
1	Agincourt	Lounge	Skating Rink	Clothing Store	Breakfast Spot	Drugstore	Diner	Discount Store	Dog Run	Doner Restaurant	Donut Shop
2	Agincourt North, L'Amoreaux East, Milliken, St...	Park	Playground	Women's Store	Drugstore	Dim Sum Restaurant	Diner	Discount Store	Dog Run	Doner Restaurant	Donut Shop
3	Albion Gardens, Beaumont Heights, Humbergate, ...	Grocery Store	Pharmacy	Pizza Place	Coffee Shop	Fast Food Restaurant	Beer Store	Fried Chicken Joint	Sandwich Place	Women's Store	Doner Restaurant
4	Alderwood, Long Branch	Pizza Place	Athletics & Sports	Gym	Coffee Shop	Skating Rink	Pharmacy	Pub	Sandwich Place	Dog Run	Dessert Shop

Results

- Clustering Neighbrhoods : Manhattan

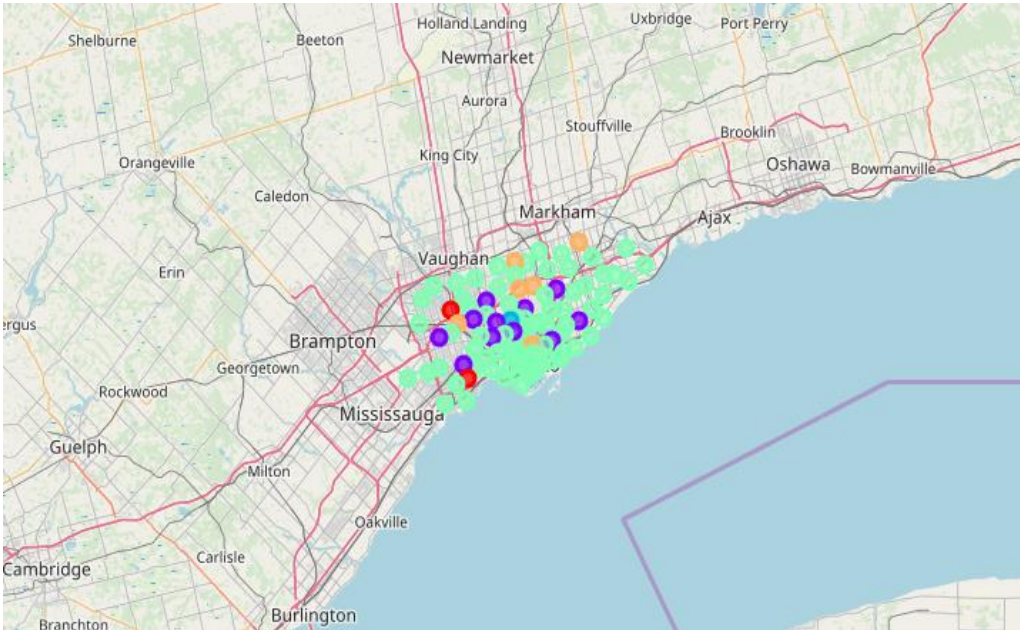
	Borough	Neighborhood	Latitude	Longitude	Cluster Labels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue
0	Manhattan	Marble Hill	40.876551	-73.910660	8	Coffee Shop	Discount Store	Clothing Store	Big Box Store	Supplement Shop	Steakhouse	Spa
1	Manhattan	Chinatown	40.715618	-73.994279	1	Chinese Restaurant	Dim Sum Restaurant	Bubble Tea Shop	American Restaurant	Cocktail Bar	Hotpot Restaurant	Salon / Barbershop
2	Manhattan	Washington Heights	40.851903	-73.936900	7	Café	Bakery	Mobile Phone Shop	Shoe Store	Grocery Store	Mexican Restaurant	Latin American Restaurant
3	Manhattan	Inwood	40.867684	-73.921210	7	Mexican Restaurant	Café	Pizza Place	Lounge	Deli / Bodega	Restaurant	Frozen Yogurt Shop
4	Manhattan	Hamilton Heights	40.823604	-73.949688	7	Mexican Restaurant	Coffee Shop	Café	Deli / Bodega	Pizza Place	Liquor Store	Indian Restaurant



Results

- Venue Popularity : Toronto

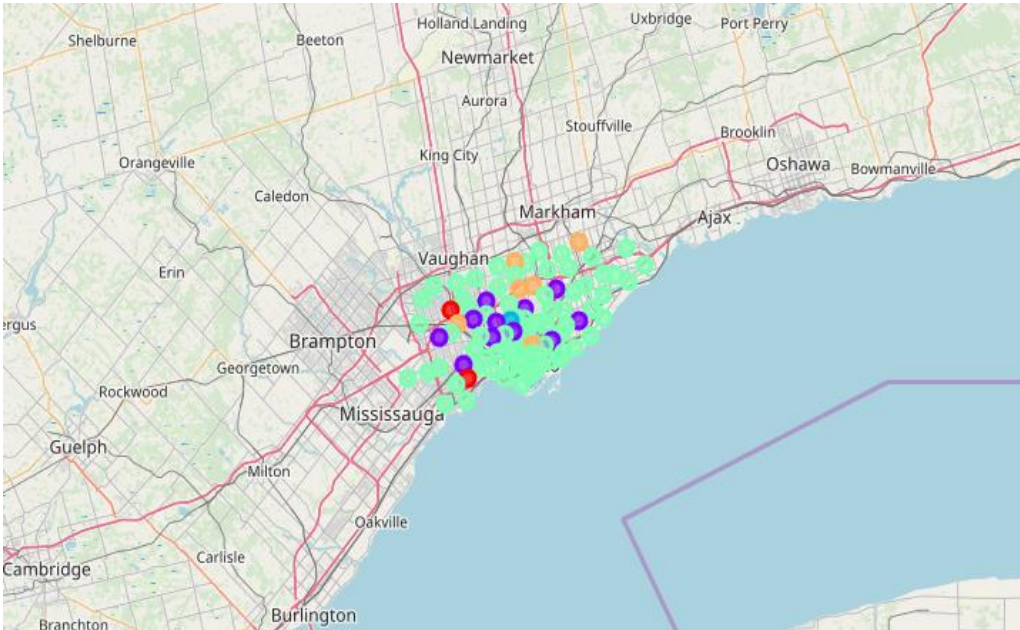
	Postcode	Borough	Neighborhood	Latitude	Longitude	Cluster Labels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue
0	M1B	Scarborough	Rouge, Malvern	43.806686	-79.194353	3.0	Fast Food Restaurant	Print Shop	Department Store	Dim Sum Restaurant	Diner	Discount Store
1	M1C	Scarborough	Highland Creek, Rouge Hill, Port Union	43.784535	-79.160497	3.0	Bar	Construction & Landscaping	Women's Store	Discount Store	Dog Run	Doner Restaurant
2	M1E	Scarborough	Guildwood, Morningside, West Hill	43.763573	-79.188711	3.0	Rental Car Location	Electronics Store	Pizza Place	Spa	Intersection	Breakfast Spot
3	M1G	Scarborough	Woburn	43.770992	-79.216917	3.0	Coffee Shop	Korean Restaurant	Insurance Office	Women's Store	Drugstore	Diner
4	M1H	Scarborough	Cedarbrae	43.773136	-79.239476	3.0	Athletics & Sports	Hakka Restaurant	Fried Chicken Joint	Bakery	Caribbean Restaurant	Bank



Results

- Venue Popularity : Toronto

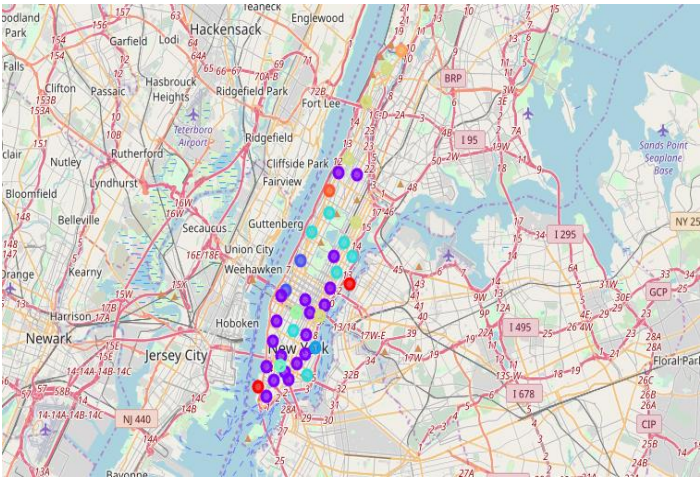
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4	M1H	Scarborough	Cedarbrae	43.773136	-79.239476	3.0	Athletics & Sports	Hakka Restaurant	Fried Chicken Joint	Bakery	Caribbean Restaurant	Bank



Results

- Cluster 1 : Manhattan

	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
11	Roosevelt Island	Park	Coffee Shop	Sandwich Place	Liquor Store	Train	Gym	Outdoors & Recreation	Bus Line	Dry Cleaner	Playground
28	Battery Park City	Park	Coffee Shop	Hotel	Gym	Food Truck	Italian Restaurant	Wine Shop	Sandwich Place	Clothing Store	Food Court



- Cluster 1 : Toronto

	Borough	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
91	Etobicoke	0.0	Baseball Field	Eastern European Restaurant	Discount Store	Dog Run	Doner Restaurant	Donut Shop	Drugstore	Dumpling Restaurant	Women's Store	Dim Sum Restaurant
97	North York	0.0	Baseball Field	Furniture / Home Store	Falafel Restaurant	Event Space	Ethiopian Restaurant	Empanada Restaurant	Electronics Store	Eastern European Restaurant	Dim Sum Restaurant	Dumpling Restaurant

