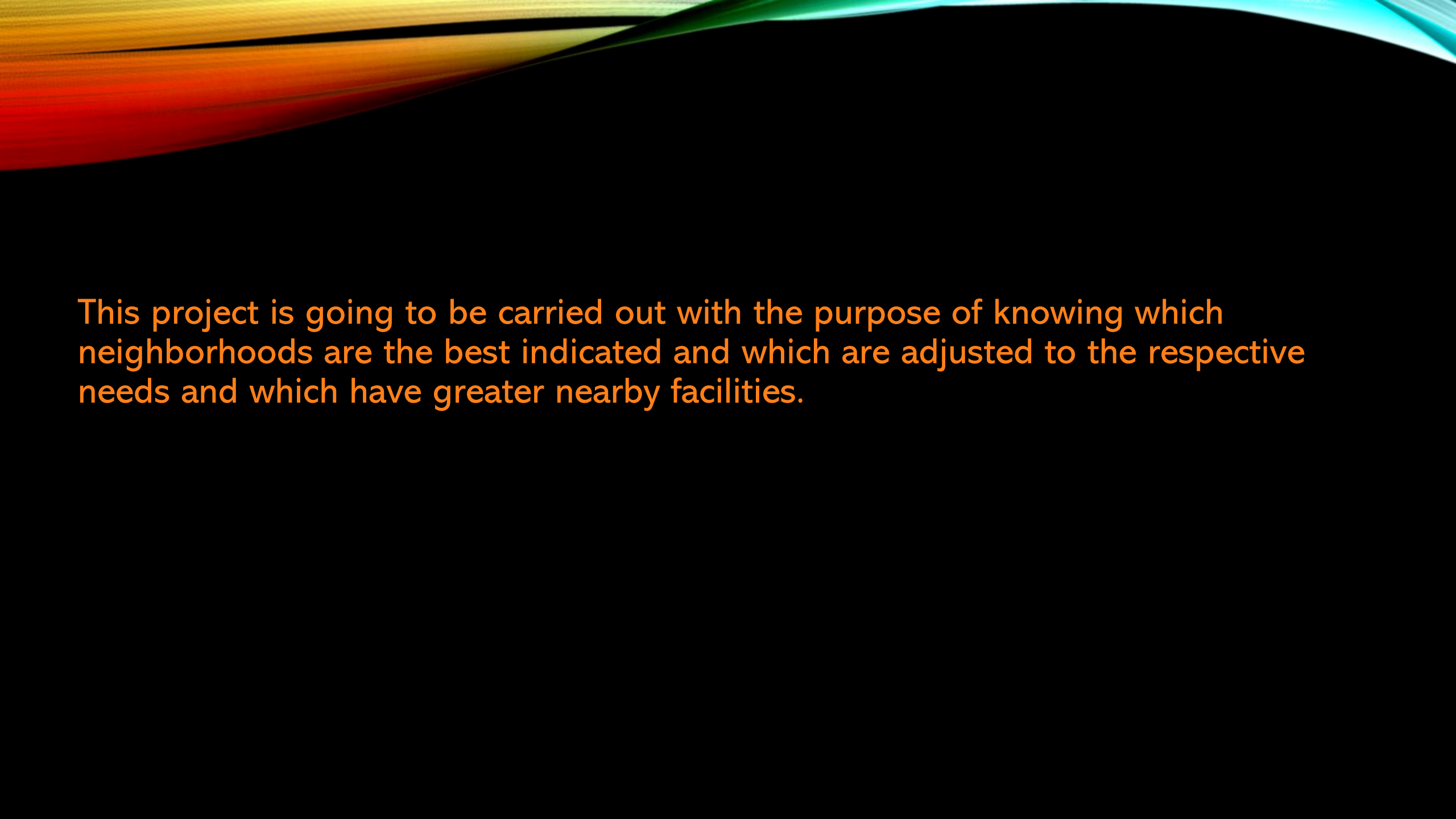


THE BATTLE OF NEIGHBORHOODS

Axel Morales Alfaro

INTRODUCTION/BUSINESS PROBLEM

Currently many people come to the city of Toronto or Manhattan to seek and obtain better and more job opportunities and for that reason they need to hear about recommendations or suggestions on appropriate and effective neighborhoods to live, for example in which there are nearby places such as supermarkets, hospitals , shops, and schools that help improve the quality



This project is going to be carried out with the purpose of knowing which neighborhoods are the best indicated and which are adjusted to the respective needs and which have greater nearby facilities.

PROBLEM DESCRIPTION

The problem to be solved in this analysis is to find the best and most appropriate neighborhood to live according to the characteristics mentioned above and that contributes to giving a better quality of life especially for people who come from other cities or towns to seek new and greater job opportunities in Toronto and Manhattan.

CLUSTERING APPROACH

The analysis of each neighborhood will be carried out using the clustering technique that consists of exploring and reviewing the neighborhoods, segmenting them and finally grouping them into clusters to obtain the results.

DATA DESCRIPTION

A geocoder library will be used in order to extract the latitude and longitude of each neighborhood.

The Foursquare API will be used in order to obtain the main characteristics of each neighborhood, such as:

- Neighborhood
- Neighborhood Longitude
- Neighborhood Latitude
- Venue
- Venue name
- Venue Category
- Venue Longitude
- Venue Latitude

DATA PREPARATION

Here we are going to extract the data from the web page Wikipedia (Used in this course for another analysis) and put this data into a dataframe.

Then we will clean the data that is not needed for this study or analysis and to replace null columns or values.

TORONTO TABLE

	Postal Code	Borough	Neighbourhood
0	M3A	North York	Parkwoods
1	M4A	North York	Victoria Village
2	M5A	Downtown Toronto	Regent Park, Harbourfront
3	M6A	North York	Lawrence Manor, Lawrence Heights
4	M7A	Downtown Toronto	Central's Ave

MANHATTAN TABLE

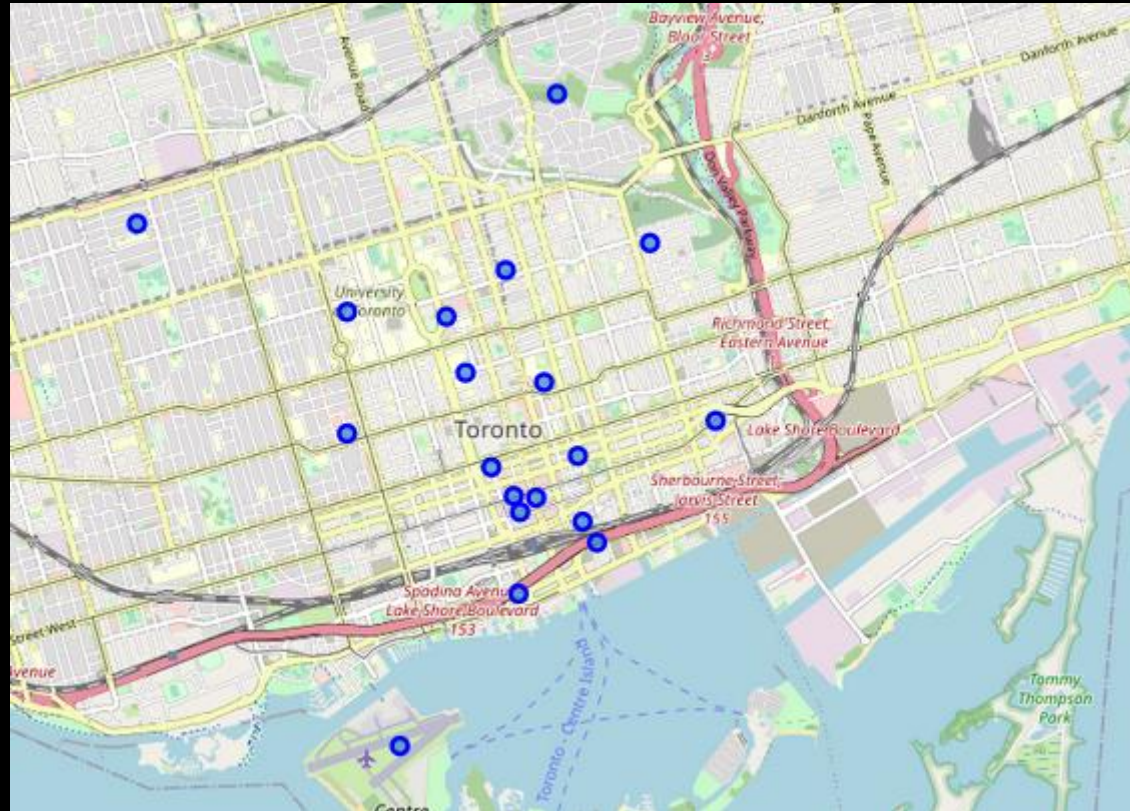
	Borough	Neighborhood	Latitude	Longitude
0	Manhattan	Marble Hill	40.878551	-73.910880
1	Manhattan	Chinatown	40.715818	-73.994279
2	Manhattan	Washington Heights	40.851903	-73.938900
3	Manhattan	Inwood	40.867884	-73.921210
4	Manhattan	Hamilton Heights	40.823804	-73.949888

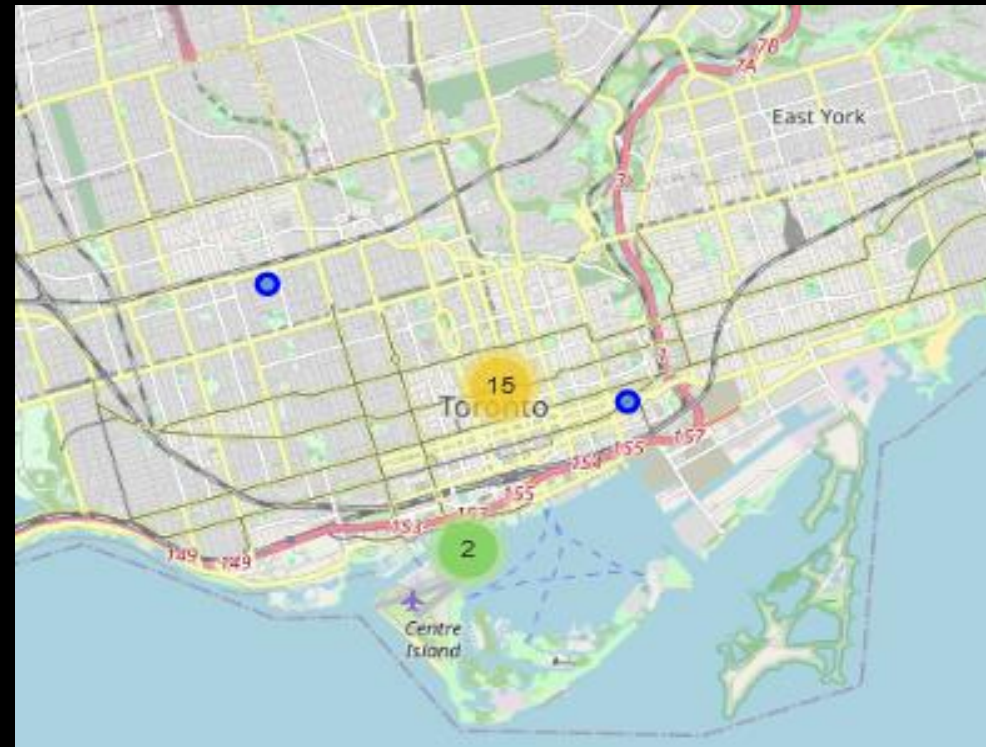
After that data is cleaned and prepared we are going to follow with the analysis.

The geograpical coordinate of Manhattan are 40.7896239, -73.9598939.

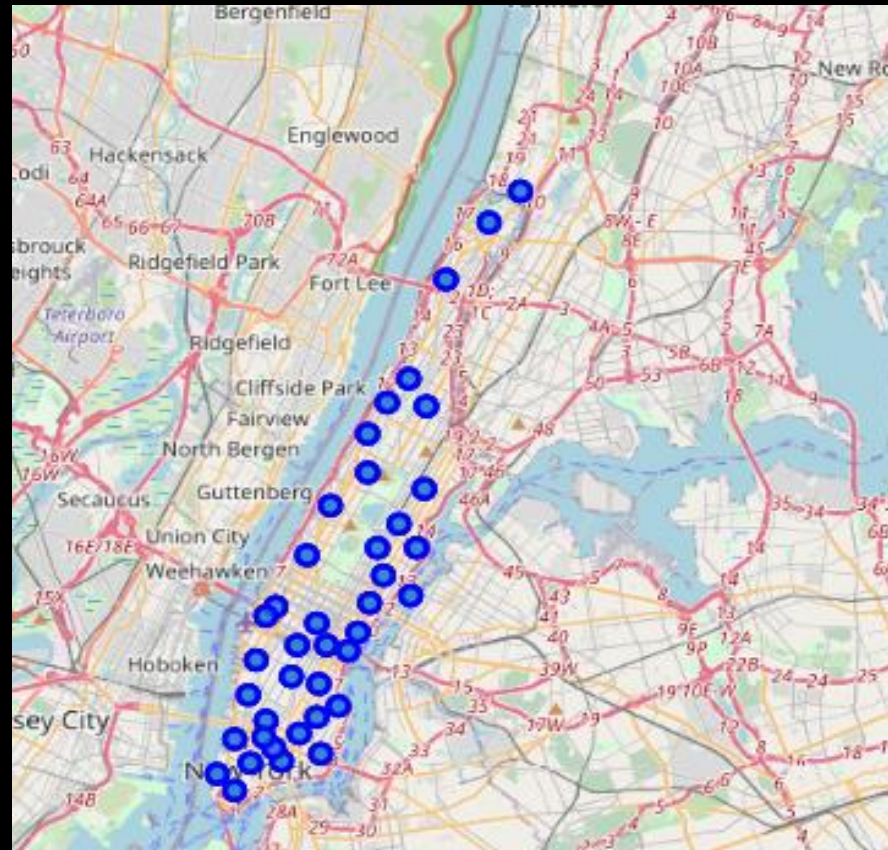
The geograpical coordinate of Toronto City are 43.6563221, -79.3809161.

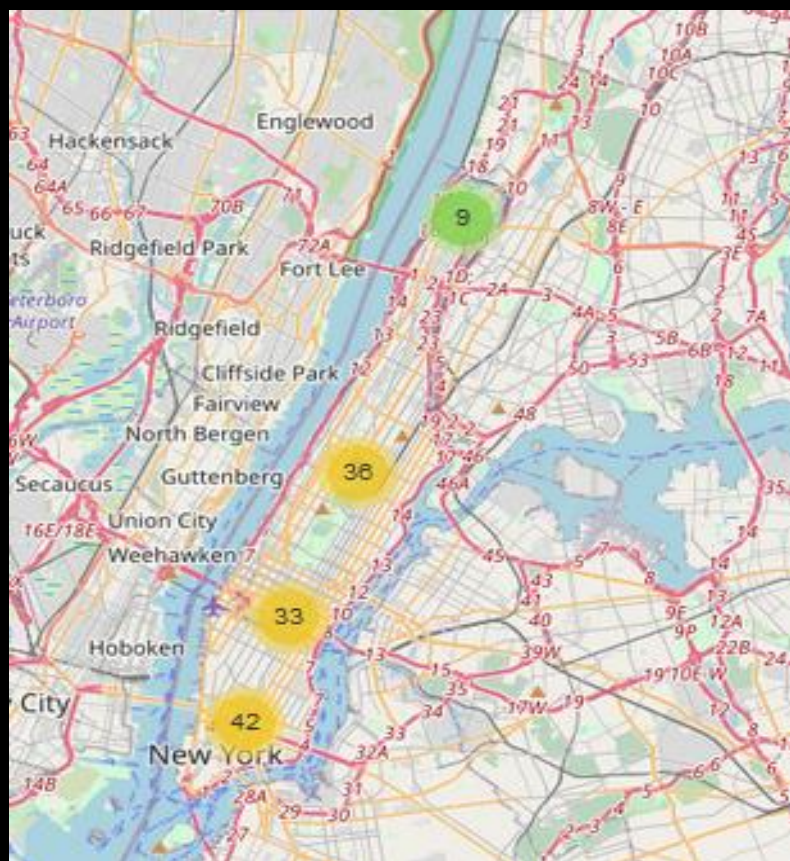
TORONTO MAPS





MANHATTAN MAPS





ANALYSIS OF DATA

WE ARE GOING TO EXPLORE NEIGHBORHOODS IN DOWNTOWN TORONTO

Regent Park, Harbourfront
Central's Ave
Garden District, Ryerson
St. James Town
Berczy Park
Central Bay Street
Christie
Richmond, Adelaide, King
Harbourfront East, Union Station, Toronto Islands
Toronto Dominion Centre, Design Exchange
Commerce Court, Victoria Hotel
University of Toronto, Harbord
Kensington Market, Chinatown, Grange Park
CN Tower, King and Spadina, Railway Lands, Harbourfront West, Bathurst Quay, South Niagara, Island airport
Rosedale
Stn A PO Boxes
St. James Town, Cabbagetown
First Canadian Place, Underground city
Church and Wellesley

(356, 7)

	Neighborhood	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
0	Regent Park, Harbourfront	43.65426	-79.380636	Roselle Desserts	43.653447	-79.382017	Bakery
1	Regent Park, Harbourfront	43.65426	-79.380636	Tandem Coffee	43.653559	-79.381809	Coffee Shop
2	Regent Park, Harbourfront	43.65426	-79.380636	Cooper Koo Family YMCA	43.653249	-79.358008	Distribution Center
3	Regent Park, Harbourfront	43.65426	-79.380636	Body Blitz Spa East	43.654735	-79.359874	Spa
4	Regent Park, Harbourfront	43.65426	-79.380636	Impact Kitchen	43.656369	-79.356980	Restaurant

	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
Neighborhood						
Berczy Park	20	20	20	20	20	20
CN Tower, King and Spadina, Railway Lands, Harbourfront West, Bathurst Quay, South Niagara, Island airport	16	16	16	16	16	16
Central Bay Street	20	20	20	20	20	20
Central's Ave	20	20	20	20	20	20
Christie	16	16	16	16	16	16
Church and Wellesley	20	20	20	20	20	20
Commerce Court, Victoria Hotel	20	20	20	20	20	20
First Canadian Place, Underground city	20	20	20	20	20	20
Garden District, Ryerson	20	20	20	20	20	20
Harbourfront East, Union Station, Toronto Islands	20	20	20	20	20	20
Kensington Market, Chinatown, Grange Park	20	20	20	20	20	20
Regent Park, Harbourfront	20	20	20	20	20	20
Richmond, Adelaide, King	20	20	20	20	20	20
Rosedale	4	4	4	4	4	4
St. James Town	20	20	20	20	20	20
St. James Town, Cabbagetown	20	20	20	20	20	20
Stn A PO Boxes	20	20	20	20	20	20
Toronto Dominion Centre, Design Exchange	20	20	20	20	20	20
University of Toronto, Harbord	20	20	20	20	20	20

Some examples of places

----Central Bay Street----

	venue	freq
0	Coffee Shop	0.20
1	Italian Restaurant	0.10
2	Spa	0.05
3	Tea Room	0.05
4	Miscellaneous Shop	0.05

----Christie----

	venue	freq
0	Grocery Store	0.25
1	Café	0.19
2	Park	0.12
3	Candy Store	0.06
4	Nightclub	0.06

----Central's Ave----

	venue	freq
0	Coffee Shop	0.20
1	Yoga Studio	0.05
2	Bank	0.05
3	Italian Restaurant	0.05
4	Fried Chicken Joint	0.05

----Church and Wellesley---

	venue	freq
0	Beer Bar	0.05
1	Bookstore	0.05
2	Coffee Shop	0.05
3	Creperie	0.05
4	Ramen Restaurant	0.05

----Commerce Court, Victoria Hotel----

	venue	freq
0	Café	0.2
1	Restaurant	0.1
2	Gastropub	0.1
3	Coffee Shop	0.1
4	Japanese Restaurant	0.1

----First Canadian Place, Underground city----

	venue	freq
0	Café	0.20
1	Coffee Shop	0.15
2	Restaurant	0.15
3	Gym / Fitness Center	0.05
4	Bakery	0.05

Some examples of places

----Kensington Market, Chinatown, Grange Park----

	venue	freq
0	Café	0.15
1	Vietnamese Restaurant	0.10
2	Wine Bar	0.05
3	Bakery	0.05
4	Coffee Shop	0.05

----Regent Park, Harbourfront----

	venue	freq
0	Coffee Shop	0.25
1	Park	0.10
2	Breakfast Spot	0.10
3	Gym / Fitness Center	0.05
4	Bakery	0.05

----Richmond, Adelaide, King----

	venue	freq
0	Gym / Fitness Center	0.05
1	Steakhouse	0.05
2	Lounge	0.05
3	Food Court	0.05
4	Monument / Landmark	0.05

----St. James Town----

	venue	freq
0	Gastropub	0.15
1	Coffee Shop	0.10
2	Japanese Restaurant	0.10
3	Restaurant	0.10
4	Hotel	0.05

----Rosedale----

	venue	freq
0	Park	0.50
1	Trail	0.25
2	Playground	0.25
3	Yoga Studio	0.00
4	Mexican Restaurant	0.00

----St. James Town, Cabbagetown----

	venue	freq
0	Restaurant	0.10
1	Café	0.10
2	Pub	0.05
3	Butcher	0.05
4	Italian Restaurant	0.05

	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	Berczy Park	Farmers Market	Seafood Restaurant	Coffee Shop	Beer Bar	Bakery	Liquor Store	Concert Hall	Park	Restaurant	Cocktail Bar
1	CN Tower, King and Spadina, Railway Lands, Har...	Airport Lounge	Airport Service	Plane	Harbor / Marina	Coffee Shop	Rental Car Location	Boutique	Boat or Ferry	Sculpture Garden	Bar
2	Central Bay Street	Coffee Shop	Italian Restaurant	Japanese Restaurant	Bubble Tea Shop	Seafood Restaurant	Spa	Ramen Restaurant	Art Museum	Sushi Restaurant	Tea Room
3	Central's Ave	Coffee Shop	Yoga Studio	Smoothie Shop	Hobby Shop	Distribution Center	Diner	Italian Restaurant	Creperie	Mexican Restaurant	Chinese Restaurant
4	Christie	Grocery Store	Café	Park	Coffee Shop	Athletics & Sports	Candy Store	Nightclub	Italian Restaurant	Baby Store	Restaurant
5	Church and Wellesley	Pizza Place	Creperie	Park	Café	Coffee Shop	Mexican Restaurant	Burger Joint	Bubble Tea Shop	Breakfast Spot	Martial Arts School
6	Commerce Court, Victoria Hotel	Café	Gastropub	Japanese Restaurant	Coffee Shop	Restaurant	Bakery	Gym / Fitness Center	Hotel	Museum	Pub
7	First Canadian Place, Underground city	Café	Coffee Shop	Restaurant	Gym	Steakhouse	Pizza Place	Gastropub	Pub	Seafood Restaurant	Bakery
8	Garden District, Ryerson	Café	Clothing Store	Pizza Place	Diner	Burrito Place	Burger Joint	Plaza	Ramen Restaurant	Coffee Shop	College Rec Center
9	Harbourfront East, Union Station, Toronto Islands	Park	Café	Plaza	Skating Rink	Salad Place	Japanese Restaurant	Bubble Tea Shop	Deli / Bodega	Sporting Goods Shop	Ice Cream Shop

10	Kensington Market, Chinatown, Grange Park	Café	Vietnamese Restaurant	Wine Bar	Bakery	Fish Market	Farmers Market	Dessert Shop	Mexican Restaurant	Coffee Shop	Organic Grocery
11	Regent Park, Harbourfront	Coffee Shop	Park	Breakfast Spot	Distribution Center	Chocolate Shop	Pub	Restaurant	Performing Arts Venue	Spa	Dessert Shop
12	Richmond, Adelaide, King	Seafood Restaurant	Steakhouse	Café	Pizza Place	Lounge	Plaza	Coffee Shop	Restaurant	Concert Hall	Smoke Shop
13	Rosedale	Park	Playground	Trail	Creperie	Cheese Shop	Chinese Restaurant	Chocolate Shop	Clothing Store	Cocktail Bar	Coffee Shop
14	St. James Town	Gastropub	Japanese Restaurant	Coffee Shop	Restaurant	BBQ Joint	Food Truck	Hotel	Italian Restaurant	Creperie	Cosmetics Shop
15	St. James Town, Cabbagetown	Café	Restaurant	Pet Store	Indian Restaurant	Park	Caribbean Restaurant	Butcher	Pub	Deli / Bodega	Bakery
16	Stn A PO Boxes	Cocktail Bar	Beer Bar	Farmers Market	French Restaurant	Japanese Restaurant	Café	Museum	Restaurant	Concert Hall	Seafood Restaurant
17	Toronto Dominion Centre, Design Exchange	Coffee Shop	Café	Restaurant	Japanese Restaurant	Gym	Hotel	Gastropub	Pub	Beer Bar	Steakhouse
18	University of Toronto, Harbord	Bakery	Café	Bookstore	Japanese Restaurant	Italian Restaurant	College Gym	Comfort Food Restaurant	Restaurant	Beer Bar	Sandwich Place

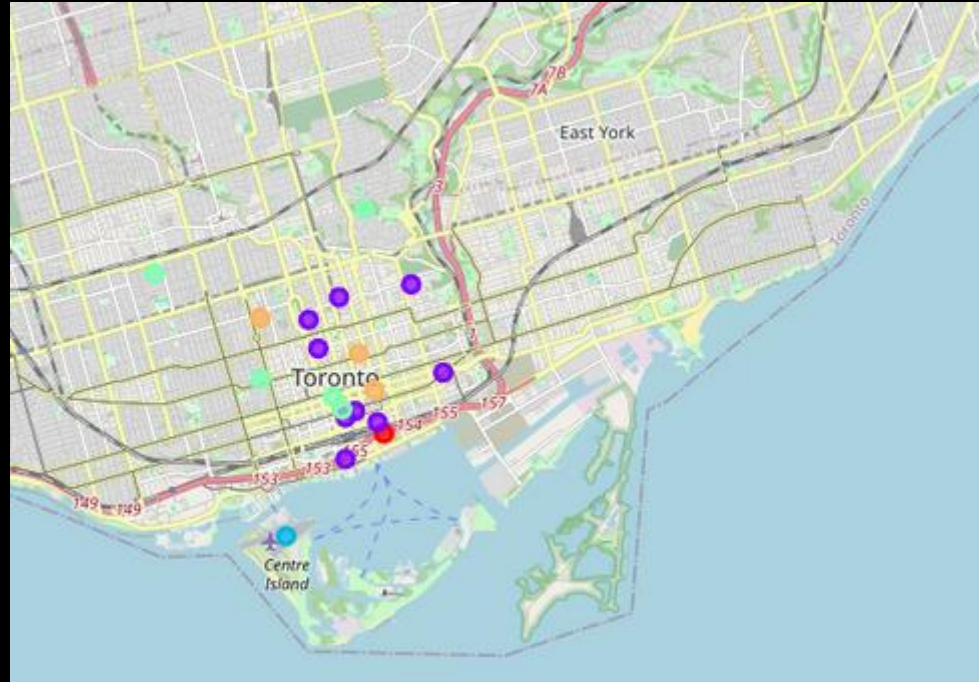


K-Mean labels

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	Borough	Neighbourhood	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	Downtown Toronto	Regent Park, Harbourfront	43.654260	-79.380636	1	Coffee Shop	Park	Breakfast Spot	Distribution Center	Chocolate Shop	Pub	Restaurant	Performing Arts Venue	Spa	
1	Downtown Toronto	Central's Ave	43.662301	-79.389494	1	Coffee Shop	Yoga Studio	Smoothie Shop	Hobby Shop	Distribution Center	Diner	Italian Restaurant	Creperie	Mexican Restaurant	
2	Downtown Toronto	Garden District, Ryerson	43.657162	-79.378937	4	Café	Clothing Store	Pizza Place	Diner	Burrito Place	Burger Joint	Plaza	Ramen Restaurant	Coffee Shop	
3	Downtown Toronto	St. James Town	43.651494	-79.375418	4	Gastropub	Japanese Restaurant	Coffee Shop	Restaurant	BBQ Joint	Food Truck	Hotel	Italian Restaurant	Creperie	
4	Downtown Toronto	Berczy Park	43.644771	-79.373306	0	Farmers Market	Seafood Restaurant	Coffee Shop	Beer Bar	Bakery	Liquor Store	Concert Hall	Park	Restaurant	
<div> <div><</div> <div></div> <div>></div> </div>															

10th Most Common Venue
Dessert Shop
Chinese Restaurant
College Rec Center
Cosmetics Shop
Cocktail Bar



Cluster 1 (Supermarket, farmer market)

	Neighbourhood	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	Bercozy Park	Farmers Market	Seafood Restaurant	Coffee Shop	Beer Bar	Bakery	Liquor Store	Concert Hall	Park	Restaurant	Cocktail Bar

Cluster 2 (Coffee shop, park, restaurant)

	Neighbourhood	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	Regent Park, Harbourfront	Coffee Shop	Park	Breakfast Spot	Distribution Center	Chocolate Shop	Pub	Restaurant	Performing Arts Venue	Spa	Dessert Shop
1	Central's Ave	Coffee Shop	Yoga Studio	Smoothie Shop	Hobby Shop	Distribution Center	Diner	Italian Restaurant	Creperie	Mexican Restaurant	Chinese Restaurant
5	Central Bay Street	Coffee Shop	Italian Restaurant	Japanese Restaurant	Bubble Tea Shop	Seafood Restaurant	Spa	Ramen Restaurant	Art Museum	Sushi Restaurant	Tea Room
8	Harbourfront East, Union Station, Toronto Islands	Park	Café	Plaza	Skating Rink	Salad Place	Japanese Restaurant	Bubble Tea Shop	Deli / Bodega	Sporting Goods Shop	Ice Cream Shop
9	Toronto Dominion Centre, Design Exchange	Coffee Shop	Café	Restaurant	Japanese Restaurant	Gym	Hotel	Gastropub	Pub	Beer Bar	Steakhouse
10	Commerce Court, Victoria Hotel	Café	Gastropub	Japanese Restaurant	Coffee Shop	Restaurant	Bakery	Gym / Fitness Center	Hotel	Museum	Pub
15	Stn A PO Boxes	Cocktail Bar	Beer Bar	Farmers Market	French Restaurant	Japanese Restaurant	Café	Museum	Restaurant	Concert Hall	Seafood Restaurant
16	St. James Town, Cabbagetown	Café	Restaurant	Pet Store	Indian Restaurant	Park	Caribbean Restaurant	Butcher	Pub	Deli / Bodega	Bakery
18	Church and Wellesley	Pizza Place	Creperie	Park	Café	Coffee Shop	Mexican Restaurant	Burger Joint	Bubble Tea Shop	Breakfast Spot	Martial Arts School

Cluster 3 (Cafeterias and related places)

	Neighbourhood	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
13	CN Tower, King and Spadina, Railway Lands, Har...	Airport Lounge	Airport Service	Plane	Harbor / Marina	Coffee Shop	Rental Car Location	Boutique	Boat or Ferry	Sculpture Garden	Bar

Cluster 4 (Other places)

	Neighbourhood	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	Christie	Grocery Store	Café	Park	Coffee Shop	Athletics & Sports	Candy Store	Nightclub	Italian Restaurant	Baby Store	Restaurant
7	Richmond, Adelaide, King	Seafood Restaurant	Steakhouse	Café	Pizza Place	Lounge	Plaza	Coffee Shop	Restaurant	Concert Hall	Smoke Shop
12	Kensington Market, Chinatown, Grange Park	Café	Vietnamese Restaurant	Wine Bar	Bakery	Fish Market	Farmers Market	Dessert Shop	Mexican Restaurant	Coffee Shop	Organic Grocery
14	Rosedale	Park	Playground	Trail	Creperie	Cheese Shop	Chinese Restaurant	Chocolate Shop	Clothing Store	Cocktail Bar	Coffee Shop
17	First Canadian Place, Underground city	Café	Coffee Shop	Restaurant	Gym	Steakhouse	Pizza Place	Gastropub	Pub	Seafood Restaurant	Bakery

	Neighbourhood	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	Christie	Grocery Store	Café	Park	Coffee Shop	Athletics & Sports	Candy Store	Nightclub	Italian Restaurant	Baby Store	Restaurant
7	Richmond, Adelaide, King	Seafood Restaurant	Steakhouse	Café	Pizza Place	Lounge	Plaza	Coffee Shop	Restaurant	Concert Hall	Smoke Shop
12	Kensington Market, Chinatown, Grange Park	Café	Vietnamese Restaurant	Wine Bar	Bakery	Fish Market	Farmers Market	Dessert Shop	Mexican Restaurant	Coffee Shop	Organic Grocery
14	Rosedale	Park	Playground	Trail	Creperie	Cheese Shop	Chinese Restaurant	Chocolate Shop	Clothing Store	Cocktail Bar	Coffee Shop
17	First Canadian Place, Underground city	Café	Coffee Shop	Restaurant	Gym	Steakhouse	Pizza Place	Gastropub	Pub	Seafood Restaurant	Bakery

We are going to explore neighborhoods in Manhattan

Marble Hill
Chinatown
Washington Heights
Inwood
Hamilton Heights
Manhattanville
Central Harlem
East Harlem
Upper East Side
Yorkville
Lenox Hill
Roosevelt Island
Upper West Side
Lincoln Square
Clinton
Midtown
Murray Hill
Chelsea
Greenwich Village
East Village
Lower East Side
Tribeca
Little Italy
Soho
West Village
Manhattan Valley
Morningside Heights
Gramercy
Battery Park City

Financial District
Carnegie Hill
Noho

Civic Center
Midtown South
Sutton Place
Turtle Bay
Tudor City
Stuyvesant Town
Flatiron
Hudson Yards
Marble Hill
Chinatown
Washington Heights
Inwood
Hamilton Heights
Manhattanville
Central Harlem
East Harlem
Upper East Side
Yorkville
Lenox Hill
Roosevelt Island
Upper West Side
Lincoln Square
Clinton
Midtown
Murray Hill
Chelsea
Greenwich Village

East Village
Lower East Side
Tribeca
Little Italy
Soho
West Village
Manhattan Valley
Morningside Heights
Gramercy
Battery Park City
Financial District
Carnegie Hill
Noho
Civic Center
Midtown South
Sutton Place
Turtle Bay
Tudor City
Stuyvesant Town
Flatiron

Hudson Yards
Marble Hill
Chinatown
Washington Heights
Inwood
Hamilton Heights
Manhattanville
Central Harlem
East Harlem
Upper East Side
Yorkville
Lenox Hill
Roosevelt Island
Upper West Side
Lincoln Square
Clinton
Midtown
Murray Hill
Chelsea
Greenwich Village
East Village
Lower East Side
Tribeca
Little Italy
Soho
West Village
Manhattan Valley
Morningside Heights
Gramercy

Battery Park City
Financial District
Carnegie Hill
Noho
Civic Center
Midtown South
Sutton Place
Turtle Bay
Tudor City
Stuyvesant Town
Flatiron
Hudson Yards

Neighborhood	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
Battery Park City	60	60	60	60	60	60
Carnegie Hill	60	60	60	60	60	60
Central Harlem	60	60	60	60	60	60
Chelsea	60	60	60	60	60	60
Chinatown	60	60	60	60	60	60
Civic Center	60	60	60	60	60	60
Clinton	60	60	60	60	60	60
East Harlem	60	60	60	60	60	60
East Village	60	60	60	60	60	60
Financial District	60	60	60	60	60	60
Flatiron	60	60	60	60	60	60
Gramercy	60	60	60	60	60	60
Greenwich Village	60	60	60	60	60	60
Hamilton Heights	60	60	60	60	60	60
Hudson Yards	60	60	60	60	60	60
Inwood	60	60	60	60	60	60
Lenox Hill	60	60	60	60	60	60
Lincoln Square	60	60	60	60	60	60

Little Italy	60	60	60	60	60	60
Lower East Side	60	60	60	60	60	60
Manhattan Valley	60	60	60	60	60	60
Manhattanville	60	60	60	60	60	60
Marble Hill	60	60	60	60	60	60
Midtown	60	60	60	60	60	60
Midtown South	60	60	60	60	60	60
Morningside Heights	60	60	60	60	60	60
Murray Hill	60	60	60	60	60	60
Noho	60	60	60	60	60	60
Roosevelt Island	60	60	60	60	60	60
Soho	60	60	60	60	60	60
Stuyvesant Town	51	51	51	51	51	51
Sutton Place	60	60	60	60	60	60
Tribeca	60	60	60	60	60	60
Tudor City	60	60	60	60	60	60
Turtle Bay	60	60	60	60	60	60
Upper East Side	60	60	60	60	60	60
Upper West Side	60	60	60	60	60	60
Washington Heights	60	60	60	60	60	60
West Village	60	60	60	60	60	60
Yorkville	60	60	60	60	60	60

There are 211 uniques categories.

[illegible]

Some examples of places

----Battery Park City----

	venue	freq
0	Memorial Site	0.15
1	Park	0.15
2	Food Court	0.10
3	Auditorium	0.05
4	Shopping Mall	0.05

----Carnegie Hill----

	venue	freq
0	Coffee Shop	0.10
1	Gym / Fitness Center	0.10
2	Italian Restaurant	0.10
3	Gym	0.10
4	Shoe Store	0.05

----Civic Center----

	venue	freq
0	Spa	0.10
1	Yoga Studio	0.05
2	Martial Arts School	0.05
3	Dance Studio	0.05
4	Cuban Restaurant	0.05

----Clinton----

	venue	freq
0	Gym / Fitness Center	0.15
1	Theater	0.10
2	Comedy Club	0.05
3	Building	0.05
4	Sporting Goods Shop	0.05

----Central Harlem----

	venue	freq
0	French Restaurant	0.10
1	African Restaurant	0.10
2	Jazz Club	0.05
3	Cocktail Bar	0.05
4	Boutique	0.05

----Chelsea----

	venue	freq
0	Theater	0.10
1	French Restaurant	0.05
2	Tapas Restaurant	0.05
3	Fish Market	0.05
4	Chinese Restaurant	0.05

----East Harlem----

	venue	freq
0	Mexican Restaurant	0.20
1	Thai Restaurant	0.10
2	Dance Studio	0.05
3	Sandwich Place	0.05
4	Steakhouse	0.05

----East Village----

	venue	freq
0	Vietnamese Restaurant	0.10
1	Korean Restaurant	0.10
2	Swiss Restaurant	0.05
3	Bar	0.05
4	Pizza Place	0.05

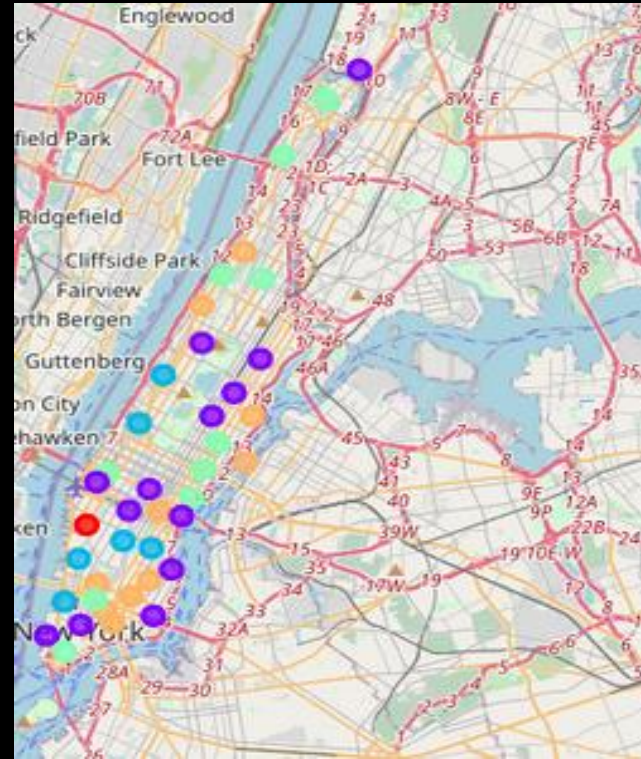
	Neighborhood	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue	9th Most Common Venue	10th Most Common Venue
0	Battery Park City	Park	Memorial Site	Food Court	Auditorium	Sandwich Place	Building	Shopping Mall	Coffee Shop	Gym	Scenic Lookout
1	Carnegie Hill	Coffee Shop	Gym / Fitness Center	Gym	Italian Restaurant	Pizza Place	Café	Dance Studio	French Restaurant	Community Center	Shoe Store
2	Central Harlem	African Restaurant	French Restaurant	Music Venue	Ethiopian Restaurant	Café	Bar	Juice Bar	Bagel Shop	Boutique	Jazz Club
3	Chelsea	Theater	Speakeasy	Hotel	Coffee Shop	New American Restaurant	Chinese Restaurant	Café	Fish Market	French Restaurant	Sushi Restaurant
4	Chinatown	Chinese Restaurant	Sandwich Place	Greek Restaurant	Noodle House	Bubble Tea Shop	Museum	Bike Shop	Salon / Barbershop	New American Restaurant	Cocktail Bar

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array([1, 4, 3, 3, 4, 3, 3, 1, 1, 4], dtype=int32)
```

	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
0	Manhattan	Marble Hill	40.876551	-73.910660	1	Coffee Shop	Gym	Sandwich Place	Discount Store	Supplement Shop
1	Manhattan	Chinatown	40.715618	-73.994279	4	Chinese Restaurant	Sandwich Place	Greek Restaurant	Noodle House	Bubble Tea Shop
2	Manhattan	Washington Heights	40.851903	-73.936900	3	Café	Wine Shop	Park	Breakfast Spot	Italian Restaurant
3	Manhattan	Inwood	40.867684	-73.921210	3	Bakery	Deli / Bodega	Park	Yoga Studio	Pet Store
4	Manhattan	Hamilton Heights	40.823604	-73.949688	4	Yoga Studio	Mexican Restaurant	Cocktail Bar	Bakery	Smoke Shop

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6th Most Common Venue	7th Most Common Venue	8th Most Common Venue	9th Most Common Venue	10th Most Common Venue
Ice Cream Shop	Pizza Place	Diner	Tennis Stadium	Seafood Restaurant
Museum	Bike Shop	Salon / Barbershop	New American Restaurant	Cocktail Bar
Market	New American Restaurant	Coffee Shop	Restaurant	Ramen Restaurant
Diner	Café	Farmers Market	Mexican Restaurant	Bistro
Café	Mediterranean Restaurant	Caribbean Restaurant	Coffee Shop	Burger Joint
				>



Cluster 1 (Commercial)

	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
17	Chelsea	Theater	Speakeasy	Hotel	Coffee Shop	New American Restaurant	Chinese Restaurant	Café	Fish Market	French Restaurant	Sushi Restaurant

Cluster 2 (Residential)

	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	Marble Hill	Coffee Shop	Gym	Sandwich Place	Discount Store	Supplement Shop	Ice Cream Shop	Pizza Place	Diner	Tennis Stadium	Seafood Restaurant
7	East Harlem	Mexican Restaurant	Thai Restaurant	Bakery	Cuban Restaurant	Steakhouse	French Restaurant	Donut Shop	Taco Place	New American Restaurant	Beer Bar
8	Upper East Side	Hotel	Bakery	Pizza Place	Cosmetics Shop	Hotel Bar	Park	Coffee Shop	Sandwich Place	Chocolate Shop	Burrito Place
13	Midtown	Hotel	Cuban Restaurant	Bookstore	Sporting Goods Shop	Spa	Shoe Shop	Salad Place	Clothing Store	Cycle Studio	Szechuan Restaurant
26	Lower East Side	Coffee Shop	Chinese Restaurant	Art Gallery	Japanese Restaurant	Yoga Studio	Juice Bar	Performing Arts Venue	Cocktail Bar	Filipino Restaurant	Cafe
28	Manhattan Valley	Bar	Yoga Studio	Thai Restaurant	Italian Restaurant	Mexican Restaurant	Grocery Store	Korean Restaurant	Fried Chicken Joint	Mexican Restaurant	Park
29	Battery Park City	Park	Memorial Site	Food Court	Auditorium	Sandwich Place	Building	Shopping Mall	Coffee Shop	Gym	Scenic Lookout
36	Carnegie Hill	Coffee Shop	Gym / Fitness Center	Gym	Italian Restaurant	Pizza Place	Cafe	Dance Studio	French Restaurant	Community Center	Shoe Store
37	Civic Center	Spa	Yoga Studio	Gym	Cuban Restaurant	Dance Studio	Panini Restaurant	Monument / Landmark	Molecular Gastronomy Restaurant	Burrito Place	Bubble Tea Shop
38	Midtown South	Korean Restaurant	Coffee Shop	Dessert Shop	Snack Place	Shoe Store	Boutique	Lingerie Store	Leather Goods Store	Clothing Store	Grocery Store
39	Tudor City	Park	Yoga Studio	Deli / Bodega	Boxing Gym	Spanish Restaurant	Seafood Restaurant	Cafe	Sushi Restaurant	Salad Place	Taco Place
47	Stuyvesant Town	Park	Playground	Harbor / Marina	Farmers Market	Fountain	Boat or Ferry	Bistro	Gas Station	Cocktail Bar	Baseball Field
55	Hudson Yards	American Restaurant	Hotel	Gym / Fitness Center	Theater	Public Art	Pedestrian Plaza	Residential Building (Apartment / Condo)	Park	Cocktail Bar	Music School

Cluster 3 (Center)

	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	Cafe	Wine Shop	Park	Breakfast Spot	Italian Restaurant	Market	New American Restaurant	Coffee Shop	Restaurant	Korean Restaurant
3	Inwood	Bakery	Deli / Bodega	Park	Yoga Studio	Pet Store	Diner	Cafe	Farmers Market	Mexican Restaurant	Bistro
5	Morningside	Coffee Shop	Italian Restaurant	Cafe	BBQ Joint	Bike Trail	Gastropub	Dumpling Restaurant	Lounge	Supermarket	Bar
6	Central Harlem	African Restaurant	French Restaurant	Music Venue	Ethiopian Restaurant	Cafe	Bar	Juice Bar	Bagel Shop	Boutique	Jazz Club
10	Lenox Hill	Gym	Thai Restaurant	Gift Shop	Middle Eastern Restaurant	Smoke Shop	Liquor Store	Tea Place	Salad Place	Dessert Shop	Gourmet Shop
14	Canton	Gym / Fitness Center	Theater	Hotel	Pizza Place	Peruvian Restaurant	Park	Comedy Club	Coffee Shop	Movie Theater	Cafe
25	Soho	Clothing Store	Sporting Goods Shop	Shoe Store	Men's Store	Dance Studio	Salon / Barbershop	Boutique	Miscellaneous Shop	Cycle Studio	Supermarket
29	Financial District	Coffee Shop	Gym / Fitness Center	Salad Place	Event Space	Pizza Place	Steakhouse	Cafe	New American Restaurant	Doctor's Office	Paleo Restaurant
34	Subway	Grocery Store	Gym	Beer Garden	Greek Restaurant	Beer Store	Gym / Fitness Center	Food Court	Bakery	Bagel Shop	Indian Restaurant
35	Turtle Bay	Karaoke Bar	Coffee Shop	Tourist Information Center	Sushi Restaurant	Cheese Shop	Tennis Court	Farmers Market	Greek Restaurant	Grocery Store	Duty-free Shop

Cluster 4 (Tourist)

	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	American Restaurant	Italian Restaurant	Bakery	Tiki Bar	Southern / Soul Food Restaurant	Chinese Restaurant	Bookstore	Movie Theater	Juice Bar	Greek Restaurant
13	Lincoln Square	Theater	Indie Movie Theater	Concert Hall	Performing Arts Venue	Gym / Fitness Center	College Arts Building	Circus	Opera House	Fountain	Library
21	Tribeca	American Restaurant	Park	Yoga Studio	Sushi Restaurant	Indie Theater	Italian Restaurant	Greek Restaurant	Dog Run	Cycle Studio	Poke Place
24	West Village	Italian Restaurant	Cocktail Bar	Coffee Shop	Gourmet Shop	Austrian Restaurant	Speakeasy	Candy Store	Mediterranean Restaurant	Boutique	Board Shop
27	Gramercy	Pizza Place	Coffee Shop	Comedy Club	Spa	Liquor Store	Sushi Restaurant	Gourmet Shop	Beer Bar	Cocktail Bar	Mexican Restaurant
38	Flatiron	Japanese Restaurant	Furniture / Home Store	Cycle Studio	Salon / Barbershop	Salad Place	Russian Restaurant	Miscellaneous Shop	Donut Shop	Gym	Gym / Fitness Center

Cluster 5 (Artistic)

	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	Chinese Restaurant	Sandwich Place	Greek Restaurant	Noodle House	Bubble Tea Shop	Museum	Bike Shop	Salon / Barbershop	New American Restaurant	Cocktail Bar
4	Hamilton Heights	Yoga Studio	Mexican Restaurant	Cocktail Bar	Bakery	Smoke Shop	Cafe	Mediterranean Restaurant	Caribbean Restaurant	Coffee Shop	Burger Joint
9	Yonkers	Wine Shop	Deli / Bodega	Italian Restaurant	Gym	Park	Sushi Restaurant	Dog Run	Liquor Store	Bagel Shop	Coffee Shop
11	Roosevelt Island	Deli / Bodega	Gym	Sandwich Place	Food & Drink Shop	Soccer Field	Outdoors & Recreation	Restaurant	Greek Restaurant	Residential Building (Apartment / Condo)	School
16	Murray Hill	Japanese Restaurant	Burger Joint	Coffee Shop	Hotel	Shanghai Restaurant	Museum	Sushi Restaurant	Sandwich Place	Tea Room	Grocery Store
18	Greenwich Village	Italian Restaurant	French Restaurant	Cafe	Sushi Restaurant	Yoga Studio	Coffee Shop	Snack Place	Caribbean Restaurant	Gourmet Shop	Beer Bar
19	East Village	Korean Restaurant	Vietnamese Restaurant	Pet Cafe	Beer Store	Dog Run	Beer Bar	Bar	Moroccan Restaurant	Bagel Shop	Scandinavian Restaurant
22	Little Italy	Coffee Shop	Wine Bar	Ice Cream Shop	Cafe	Sandwich Place	Thai Restaurant	Spanish Restaurant	Chinese Restaurant	Salon / Barbershop	Salad Place
26	Morningside Heights	Bookstore	Park	American Restaurant	Greek Restaurant	Outdoor Sculpture	Mexican Restaurant	Farmers Market	Cafe	Food Truck	Sandwich Place
31	NoHo	Wine Shop	Rock Club	French Restaurant	Hotel	Gym	Deli / Bodega	Coffee Shop	Cocktail Bar	Sandwich Place	Southern / Soul Food Restaurant

CONCLUSIONS AND FINAL RESULTS

For Toronto , at the end of the clustering, it is concluded that cluster number two is the one that shows the largest amounts of records and that means that people have greater interest in this area group respectively compared to the other areas.

For Manhattan , at the end of clustering, it can be stated that clusters 2 to 5 have similar amounts and that means that people residing in that area or tourists show a greater attraction to this type of area compared to the commercial area that only returned a result or record.

Carrying out this analysis is very important because more people are coming to these types of cities to find better job opportunities or just for tourism and pleasure and it is very important that there is a statistical record of the places that are most frequented or with the best rating to give better advertising.