Capstone Project

BATTLE OF NEIGHBORHOODS-TORONTO AND NEW YORK

Introduction and Business problem

- Company XYZ, headquartered in India is planning to set up a conference in North America. It has offices in both Toronto and New York.

- Janice, the senior manager wants to compare downtown Toronto and Manhattan as the two cities for the Conference.

- Explore neighborhoods in the two cities

- Explore the demographics of the two cities such as population, average income and density of each neighborhood.

Data -1

▶ Toronto data that contains different borough, neighborhoods and their postal codes

https://en.wikipedia.org/wiki/List_of_postal_codes_of_Canada:_M

▶ Coordinates of the Toronto neighborhoods

http://cocl.us/Geospatial_data/Geospatial_Coordinates.csv

▶ New York data containing different boroughs, neighborhoods and their coordinates

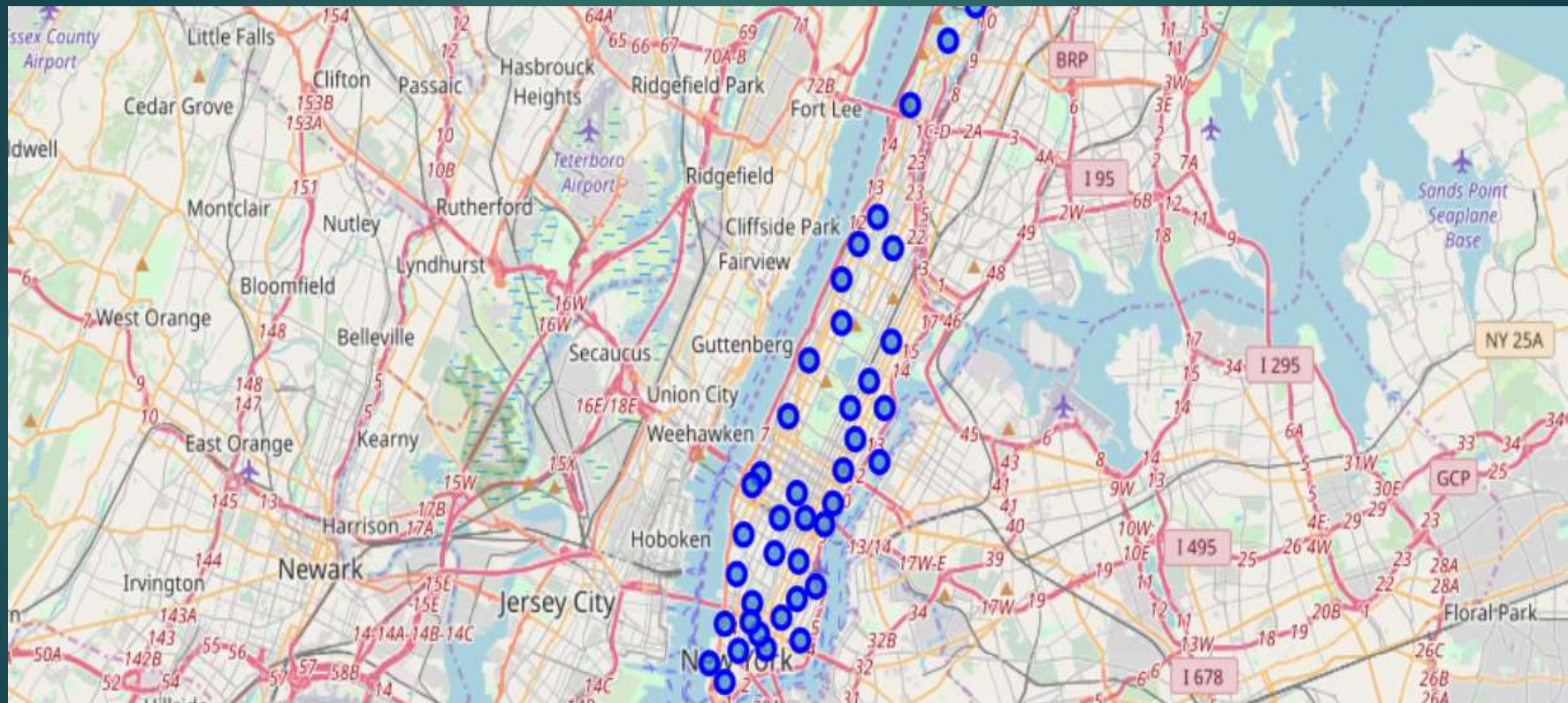▶ The coordinates (latitude, longitude) of the neighborhoods of Downtown Toronto and Manhattan using geolocator

Data-2

▶ From Foursquare API, we will need the following data:

-Nearby venue names with their latitudes and longitudes

-Top 5 most common venues for each neighborhood

-Top 10 most common venues for each neighborhood

▶ Average Income, Population and Density of New York

▶ Wikipedia (Demographics of New York City)

▶ Average Income, Population and Density of Toronto

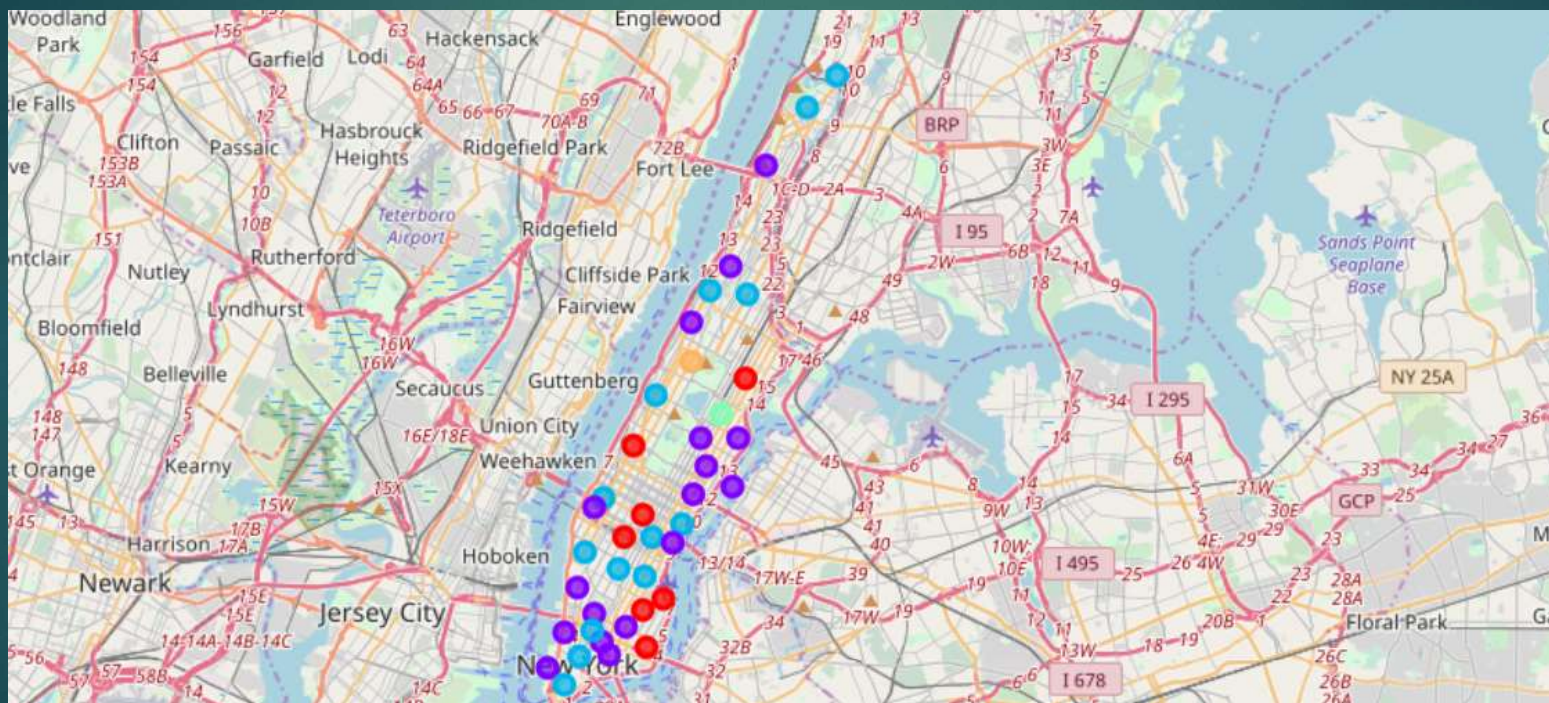▶ Wikipedia (Demographics of Toronto neighbourhoods)

Methodology

- ▶ Extract Toronto and New York borough and neighborhood data
- ▶ Get the latitudes and longitudes of the neighborhoods
- ▶ Compare Downtown Toronto and Manhattan
- ▶ -Coordinates
- ▶ -use Foursquare API, to get nearby venues for each city
- ▶ -Analyze each neighborhood to find the most common venues
- ▶ -For each neighborhood, find the 10 most common venues
- ▶ -Run k means clustering for each neighborhood by setting k=5 clusters
- ▶ -Map 10 most common venues of each neighborhood with their clusters

Downtown Toronto neighborhoods

Manhattan neighborhoods

Downtown Toronto neighborhood cluster

Manhattan neighborhood cluster

Methodology

▶ Extract Average Income, Population and Density data of the two cities from Wikipedia.

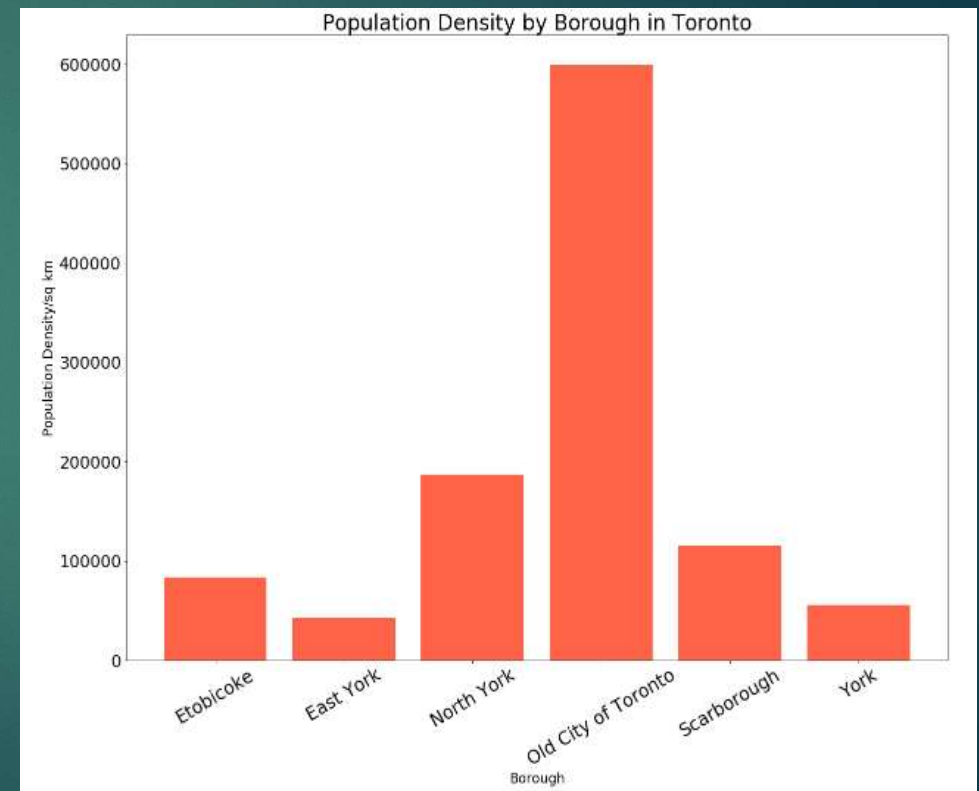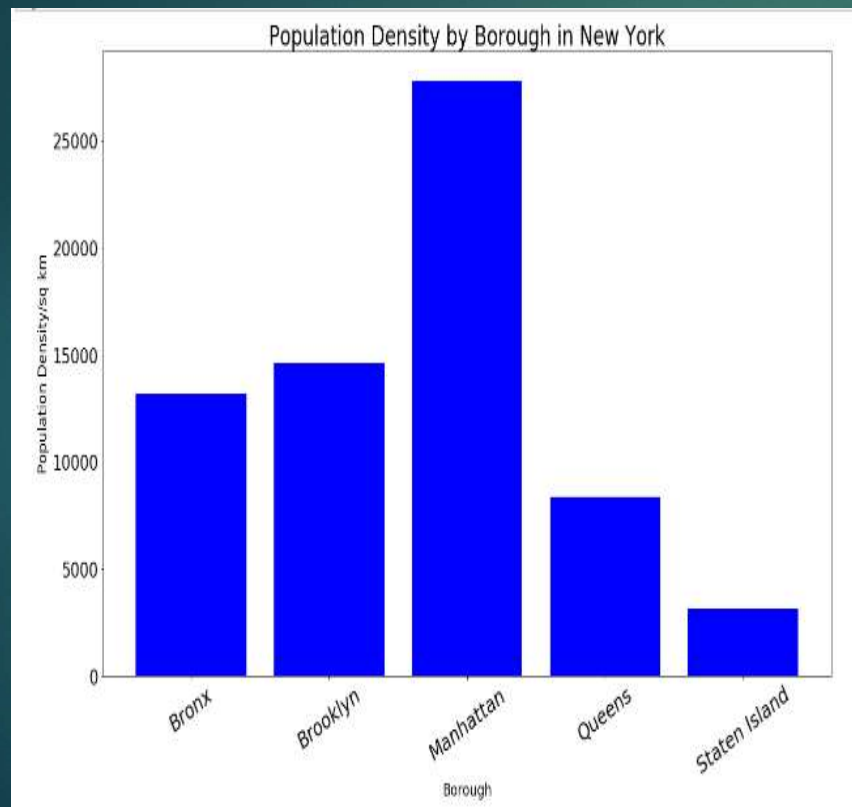▶ Compare the two cities for each of the categories using bar charts.

Results

- Downtown Toronto and Manhattan are similar in nearby venue categories, with few differences

Manhattan	Downtown Toronto
Bigger city, has more neighborhoods	Smaller city, has lesser neighborhoods
Restaurants are the most common venues	Coffee shops are the most common venues
Financial district	Financial district

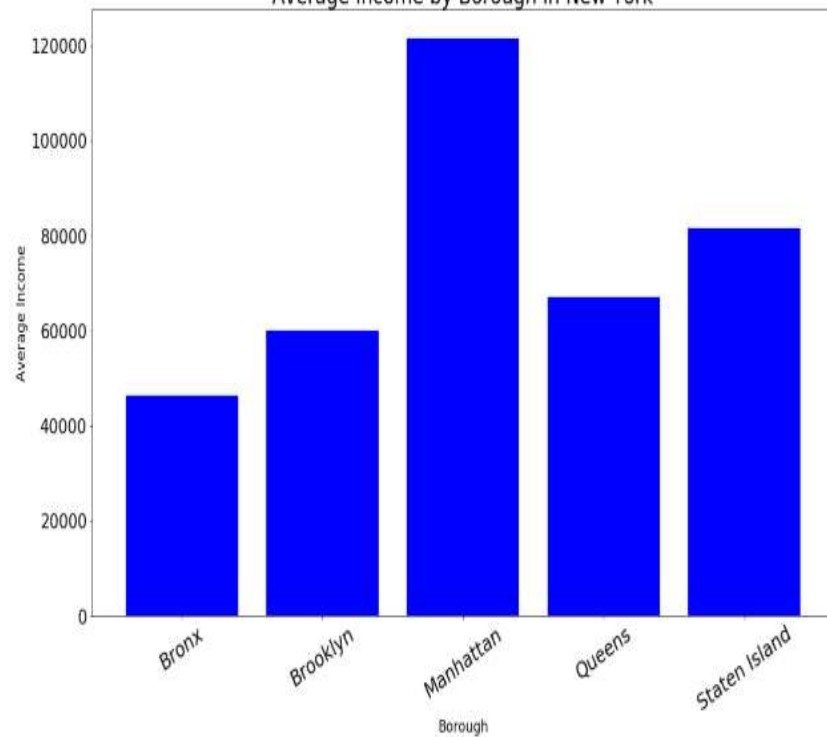|	Borough	Neighborhood	Latitude	Longitude	Cluster Labels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue
0	Manhattan	Marble Hill	40.876551	-73.910660	2	Sandwich Place	Discount Store	Coffee Shop	Yoga Studio	Clothing Store	Supplement Shop	Gym	Donut Shop
1	Manhattan	Chinatown	40.715618	-73.994279	1	Chinese Restaurant	Cocktail Bar	American Restaurant	Vietnamese Restaurant	Salon / Barbershop	Bakery	Bubble Tea Shop	Sp
2	Manhattan	Washington Heights	40.851903	-73.936900	1	Café	Mobile Phone Shop	Bakery	Grocery Store	Coffee Shop	Mexican Restaurant	Liquor Store	Latin American Restaura
3	Manhattan	Inwood	40.867684	-73.921210	2	Mexican Restaurant	Café	Lounge	Pizza Place	Park	Bakery	Caribbean Restaurant	Chines Restaura
4	Manhattan	Hamilton Heights	40.823604	-73.949688	1	Coffee Shop	Mexican Restaurant	Pizza Place	Café	Yoga Studio	Indian Restaurant	Sushi Restaurant	Sandwi P

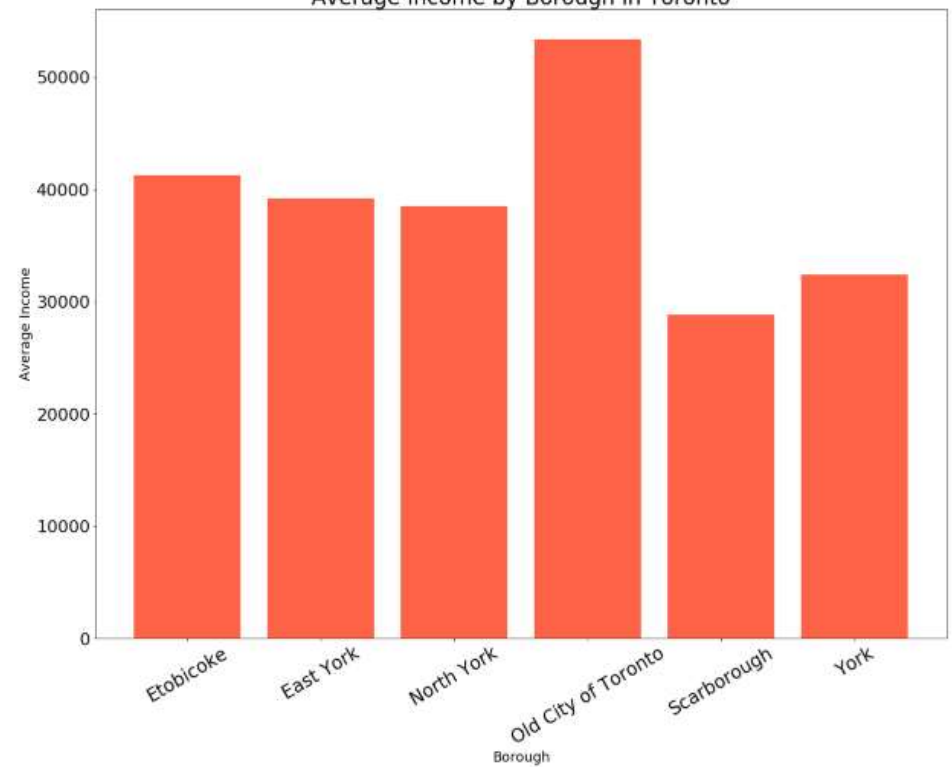|	Neighborhood	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue	9th Most Common Venue	10th Most Common Venue
0	Rosedale	Park	Playground	Trail	Building	Dim Sum Restaurant	Electronics Store	Eastern European Restaurant	Dumpling Restaurant	Donut Shop	Doner Restaurant
1	Cabbagetown, St. James Town	Coffee Shop	Café	Pub	Italian Restaurant	Park	Bakery	Pizza Place	Restaurant	Japanese Restaurant	Sandwich Place
3	Harbourfront, Regent Park	Coffee Shop	Bakery	Park	Mexican Restaurant	Gym / Fitness Center	Breakfast Spot	Restaurant	Pub	Café	Theater
4	Ryerson, Garden District	Coffee Shop	Clothing Store	Cosmetics Shop	Fast Food Restaurant	Café	Bubble Tea Shop	Restaurant	Italian Restaurant	Lingerie Store	Ice Cream Shop
7	Central Bay Street	Coffee Shop	Café	Italian Restaurant	Ice Cream Shop	Sandwich Place	Burger Joint	Chinese Restaurant	Sushi Restaurant	Bar	Japanese Restaurant
8	Adelaide, King, Richmond	Coffee Shop	Café	Thai Restaurant	Bar	American Restaurant	Steakhouse	Gym	Burger Joint	Sushi Restaurant	Hotel

Population Density

Average Income

Discussion/Recommendation

Analysis can be improved by considering the following:

► Hotel prices for the conference in both Manhattan and Downtown Toronto.

► Taking into account the number of conference attendees in both cities to reduce travel time for the employees.

► The distance between the chosen city office and the hotel for the conference.

► The data accuracy of venues depends on Four square API.