Capstone Project Report

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1. Introduction – Idea

Compare the two financial cities New York and Toronto for their Neighbourhoods and find a similarity between the 2 financial capital cities. The data can be leveraged by other countries government or other cities of USA and Canada so that they can also try to become a financial hub.

As per the definition from Investopedia, A financial hub is a city or region where a large number and variety of financial services institutions are headquartered.

Economists have attempted to explain the phenomenon of financial hubs, whereby financial services firms cluster together in certain cities, through what they call cluster theory. According to cluster theory, it benefits firms within an industry to co-locate in a certain city because it is easier to hire capable workers when industries are concentrated.

2. Data

The following datasets will be used to meet the idea in section 1.

- Neighbourhood data for New York and Toronto.

  The New york city neighbours data is readily available and can be downloaded from a link whereas Toronto neighbours data has to be derived from Wiki for Toronto.

- FourSquare location data to explore the venues around the cities and segment them.

- Latitude and Longitude details for Toronto postcodes.

From the above datasets, for both the cities, explore the financial institutions within a specified limit. Also, explore other common venues and cluster them using kmeans algorithm.

3. Methodology

The data sets as explained in section 2 were used as the source for data exploration. FourSquare data was used to identify and explore the 100 venues within 1000 metres range of New York. Similarly, for Toronto, 100 neighbours within 1000 metres range were identified.

The categories of the neighbours were also requested using FourSquare.

The goal was to identify and cluster the categories within the venues.

4. Results

The New York city dataset contains around 360 Neighbours. The following map shows the depiction of these neighbours.
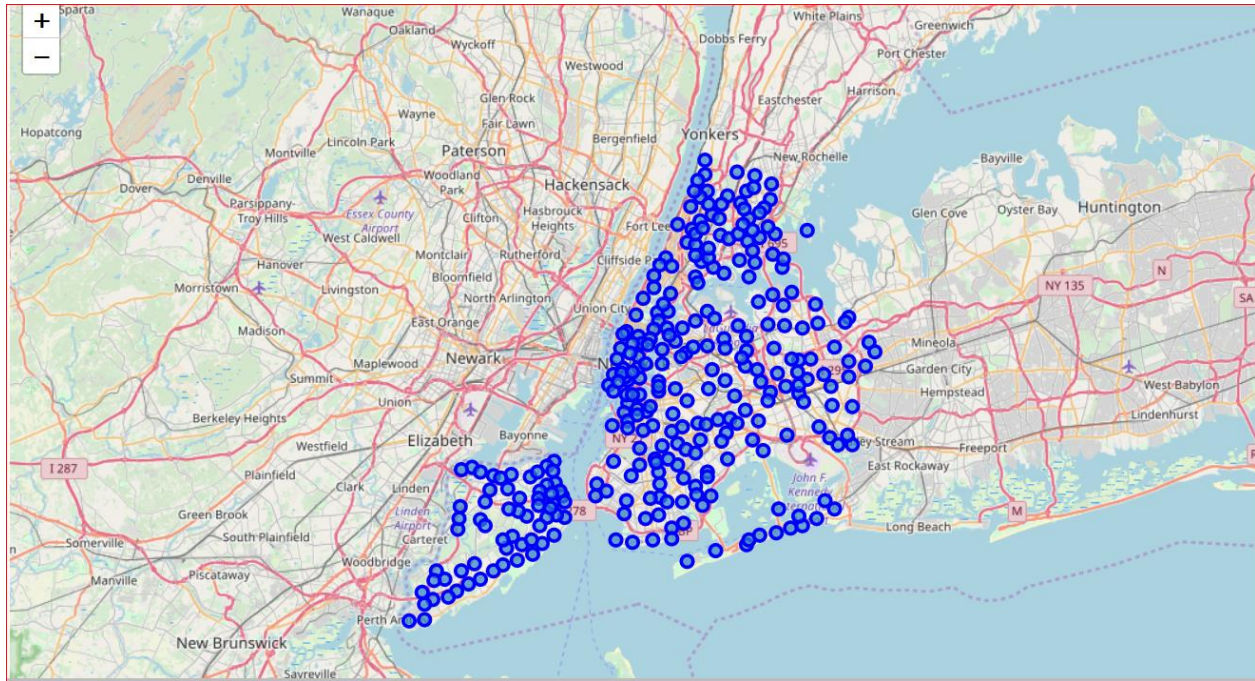

Figure 1 New York City Neighbourhoods

Manhattan is the financial hub of New York. The below map shows the map of Manhattan. From the map, it is seen that the financial institutes are located in a cluster in Manhattan.
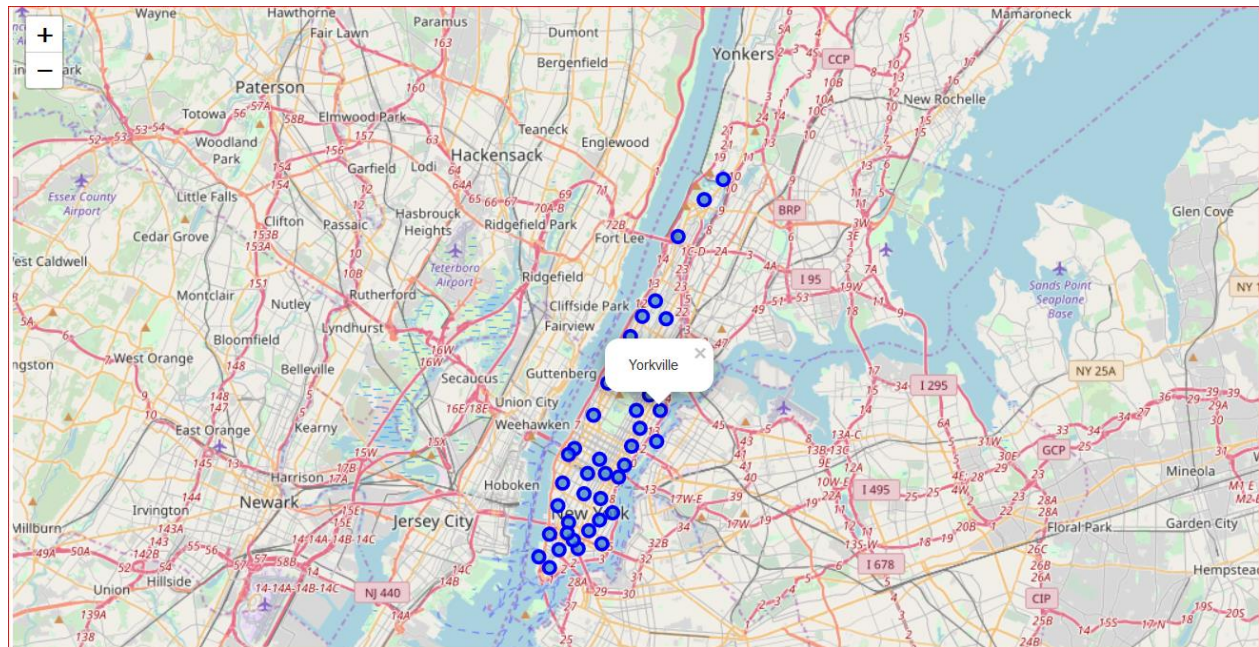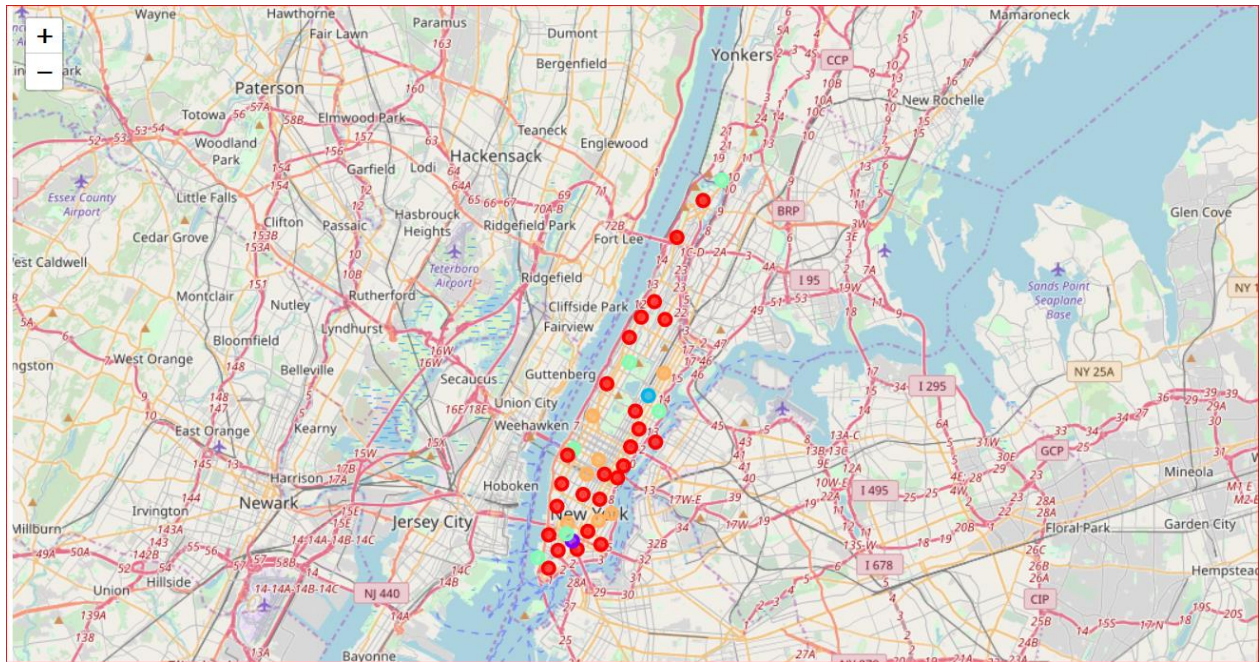
Figure 2 Manhattan Neighbours

Manhattan Neighbors in a tabular format.

[37]:	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
Neighborhood						
Battery Park City	94	94	94	94	94	94
Carnegie Hill	100	100	100	100	100	100
Central Harlem	43	43	43	43	43	43
Chelsea	100	100	100	100	100	100
Chinatown	100	100	100	100	100	100
Civic Center	100	100	100	100	100	100
Clinton	100	100	100	100	100	100
East Harlem	43	43	43	43	43	43
East Village	100	100	100	100	100	100
Financial District	100	100	100	100	100	100
Flatiron	100	100	100	100	100	100
Gramercy	100	100	100	100	100	100
Greenwich Village	100	100	100	100	100	100
Hamilton Heights	62	62	62	62	62	62
Hudson Yards	58	58	58	58	58	58
Inwood	54	54	54	54	54	54

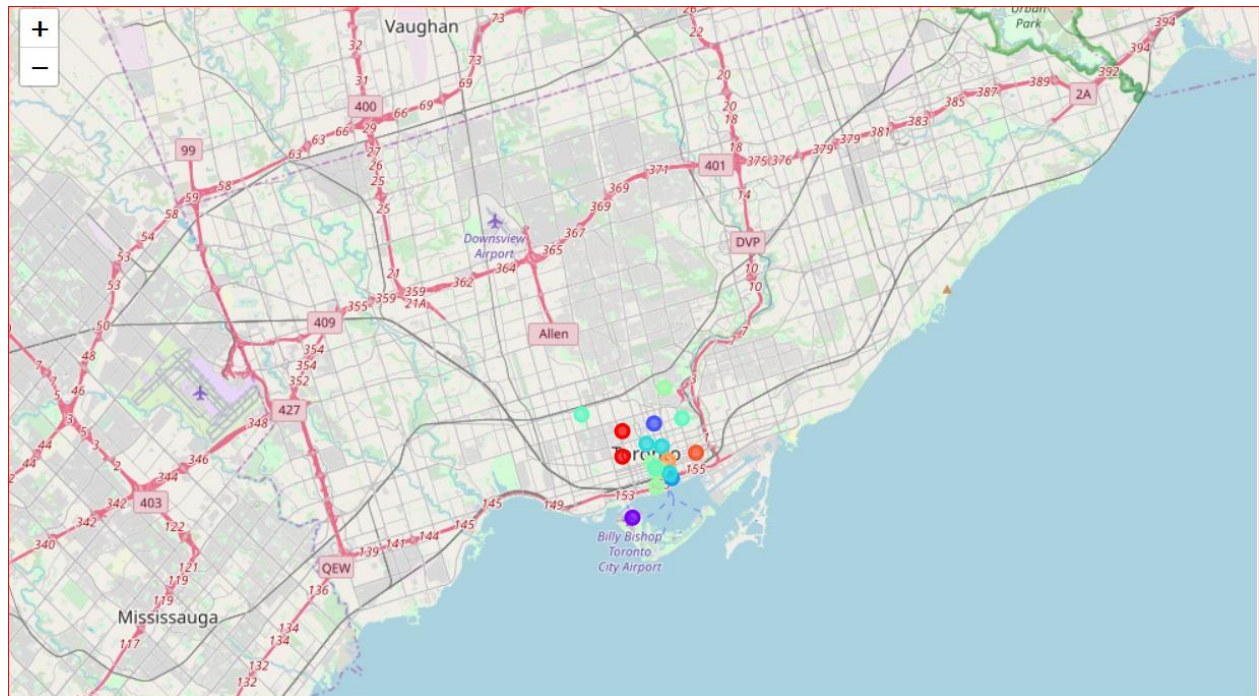The Neighbours were clustered using kmeans ckustering. The following map shows the clustered data for New York city.

Some sample of the clustered data for Manhattan is as below

	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	3	Discount Store	Yoga Studio	Comfort Food Restaurant	Supplement Shop	Steakhouse	Shoe Store	Seafood Restaurant	Sandwich Place	Coffee Shop	Pizza Place
1	Manhattan	Chinatown	40.715618	-73.994279	0	Chinese Restaurant	Bubble Tea Shop	American Restaurant	Dim Sum Restaurant	Vietnamese Restaurant	Ice Cream Shop	Noodle House	Bakery	Dumpling Restaurant	Salon / Barbershop
2	Manhattan	Washington Heights	40.851903	-73.936900	0	Café	Mobile Phone Shop	Bakery	Sandwich Place	Grocery Store	Deli / Bodega	Tapas Restaurant	Lounge	Liquor Store	Latin American Restaurant
3	Manhattan	Inwood	40.867684	-73.921210	0	Mexican Restaurant	Café	Lounge	Pizza Place	Wine Bar	Bakery	American Restaurant	Spanish Restaurant	Deli / Bodega	Frozen Yogurt Shop
4	Manhattan	Hamilton Heights	40.823604	-73.949688	0	Mexican Restaurant	Coffee Shop	Café	Deli / Bodega	Pizza Place	Yoga Studio	Chinese Restaurant	Liquor Store	Sushi Restaurant	Cocktail Bar

For Toronto,

The following is the clustered map.

Sample clustered data is as below

	Postcode	Borough	Neighbourhood	Postal Code	Latitude	Longitude	Cluster Labels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	...	41th Most Common Venue	42th Most Common Venue	43th Most Common Venue	44 Mc Commi Ven
0	M4W	Downtown Toronto	Rosedale	M4W	43.679563	-79.377529	6	Park	Playground	Trail	...	Fast Food Restaurant	Fried Chicken Joint	French Restaurant	Fount
1	M4X	Downtown Toronto	Cabbagetown,St. James Town	M4X	43.667967	-79.367675	5	Coffee Shop	Restaurant	Café	...	French Restaurant	Department Store	General Travel	Dar Stu
2	M4Y	Downtown Toronto	Church and Wellesley	M4Y	43.665860	-79.383160	2	Japanese Restaurant	Coffee Shop	Sushi Restaurant	...	Yoga Studio	Nightclub	Food & Drink Shop	Sculptu Garc
3	M5A	Downtown Toronto	Harbourfront,Regent Park	M5A	43.654260	-79.360636	9	Coffee Shop	Park	Bakery	...	Donut Shop	Doner Restaurant	Dog Run	Disco St
4	M5B	Downtown Toronto	Ryerson,Garden District	M5B	43.657162	-79.378937	4	Coffee Shop	Clothing Store	Café	...	Burger Joint	Gym	Spa	Wine E

5. Discussion

From the above maps in section 4, it seems that although Toronto is small in size in compared to New York, the infrastructure or the facilities are in line with those of New York.

It has been observed that, both the cities have high number of restaurants, shopping complexes, and financial institutes and more importantly the stock exchanges are in the cities.

6. Conclusion

Thus it can be inferred that to become a financial hub, it starts with operating a stock market from the city, building financial office spaces and having lots of restaurants and shopping complexes around the neighbourhoods of the city.