Report

The Battle of Neighborhoods

Location: Scarborough, Toronto

1. Introduction:

This project is intended to help in exploring facilities around the neighborhood, to make efficient decision on selecting a particular region out from the neighborhood of Scarborough, Toronto.

This project is for people looking for better neighborhoods. For ease of access to amenities such as Cafe, School, Supermarket, medical shops, grocery shop, theatre, hospital, ethnics, etc.

This project aims to create an analysis of features for a people migrating to Scarborough to search a best neighborhood as a comparative analysis between neighborhoods. The feature includes better school according to ratings, road connectivity, weather conditions, good management for emergency, water resources, and sewage systems and hangout facilities. This will help to have awareness of the area and neighborhood before moving to the new city, state, country or place for their work or to start a new life.

2. Data Section

Scarborough is a region for new immigrants in Canada to live. Scarborough is one of the most diverse and multicultural areas in the Greater Toronto Area, being home to various religious groups and places of worship.

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

The data retrieved from Foursquare contained information of venues within a specified distance of the longitude and latitude of the postcodes. The information obtained per venue as follows:

1. Neighborhood

2. Neighborhood Latitude

3. Neighborhood Longitude

4. Venue

5. Name of the venue e.g. the name of a store or restaurant

6. Venue Latitude

7. Venue Longitude

8. Venue Category

3. Methodology

For this project we make use of the following:

a) Clustering Approach:

To compare the similarities of two cities, we decided to explore neighborhoods, segment them, and group them into clusters to find similar neighborhoods in a big city like New York and Toronto. To be able to do that, we need to cluster data which is a form of unsupervised machine learning: k-means clustering algorithm

b) Work Flow:

Using credentials of Foursquare API features of near-by places of the neighborhoods would be mined. Due to http request limitations the number of places per neighborhood parameter would reasonably be set to 100 and the radius parameter would be set to 700.

c) Foursquare API:

Four-square API would be used in this project as a gathering source as it has a database of millions of places, especially their places API which provides the ability to perform location search, location sharing and details about a business.

d) Libraries Which are Used to Developed the Project:

Pandas: For creating and manipulating data frames.

Folium: Python visualization library would be used to visualize the neighborhoods cluster distribution of using interactive leaflet map.

Scikit Learn: For importing k-means clustering.

JSON: Library to handle JSON files.

XML: To separate data from presentation and XML stores data in plain text format.

Geocoder: To retrieve Location Data. Beautiful Soup and Requests: To scrap and library to handle http requests.

Matplotlib: Python Plotting Module

4. Result

a) Map of Scarborough

Figure 1: Map of Scarborough

b) Cluster Approach

	Postalcode	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	M1B	Scarborough	Rouge, Malvern	43.811525	-79.195517	0	Zoo Exhibit	Financial or Legal Service	Fast Food Restaurant	Construction & Landscaping	Fish & Chips Shop	Filipino Restaurant	Field
1	M1C	Scarborough	Highland Creek, Rouge Hill, Port Union	43.785665	-79.158725	0	Bar	Falafel Restaurant	Donut Shop	Dumpling Restaurant	Eastern European Restaurant	Electronics Store	Elementary School
2	M1E	Scarborough	Guildwood, Morningside, West Hill	43.765815	-79.175193	2	Park	Gym / Fitness Center	Pool	Fried Chicken Joint	Indian Restaurant	Athletics & Sports	Ethiopian Restaurant
3	M1G	Scarborough	Woburn	43.768369	-79.217590	0	Coffee Shop	Fast Food Restaurant	Business Service	Park	Yoga Studio	Dumpling Restaurant	Eastern European Restaurant
4	M1H	Scarborough	Cedarbrae	43.769688	-79.239440	0	Flower Shop	Athletics & Sports	Thai Restaurant	Bank	Bakery	Caribbean Restaurant	Hakka Restaurant

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
Construction & Landscaping	Fish & Chips Shop	Filipino Restaurant	Field	Fish Market	Farmers Market	Doner Restaurant
Dumpling Restaurant	Eastern European Restaurant	Electronics Store	Elementary School	Ethiopian Restaurant	Event Space	Yoga Studio
Fried Chicken Joint	Indian Restaurant	Athletics & Sports	Ethiopian Restaurant	Donut Shop	Dumpling Restaurant	Eastern European Restaurant
Park	Yoga Studio	Dumpling Restaurant	Eastern European Restaurant	Electronics Store	Elementary School	Ethiopian Restaurant
Bank	Bakery	Caribbean Restaurant	Hakka Restaurant	Indian Restaurant	Eastern European Restaurant	Electronics Store

Figure 2: Cluster Approach result

c) Similar venues in neighborhoods

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
Adelaide, King, Richmond	Coffee Shop	Café	Hotel	Gastropub	Burger Joint	Asian Restaurant	Bar	Restaurant	American Restaurant
Agincourt	Chinese Restaurant	Shopping Mall	Pizza Place	Supermarket	Sushi Restaurant	Breakfast Spot	Print Shop	Mediterranean Restaurant	Coffee Shop
Agincourt North, L'Amoreaux East, Milliken, St...	Pharmacy	Sandwich Place	Sushi Restaurant	Doner Restaurant	Donut Shop	Dumpling Restaurant	Eastern European Restaurant	Electronics Store	Elementary School
Albion Gardens, Beaumond Heights, Humbergate, ...	Grocery Store	Park	Sandwich Place	Discount Store	Japanese Restaurant	Fried Chicken Joint	Beer Store	Hardware Store	Pizza Place

Figure 3: Similar venues in neighborhoods

d) Map of clusters in Scarborough

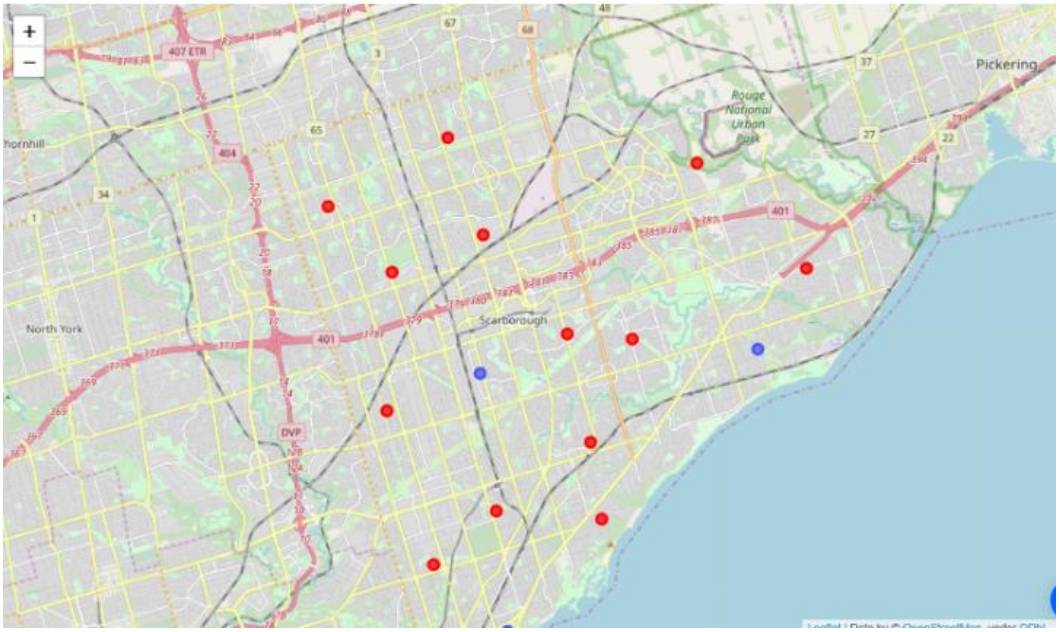

Figure 4: Map of clusters in Scarborough

e) Scarborough House price

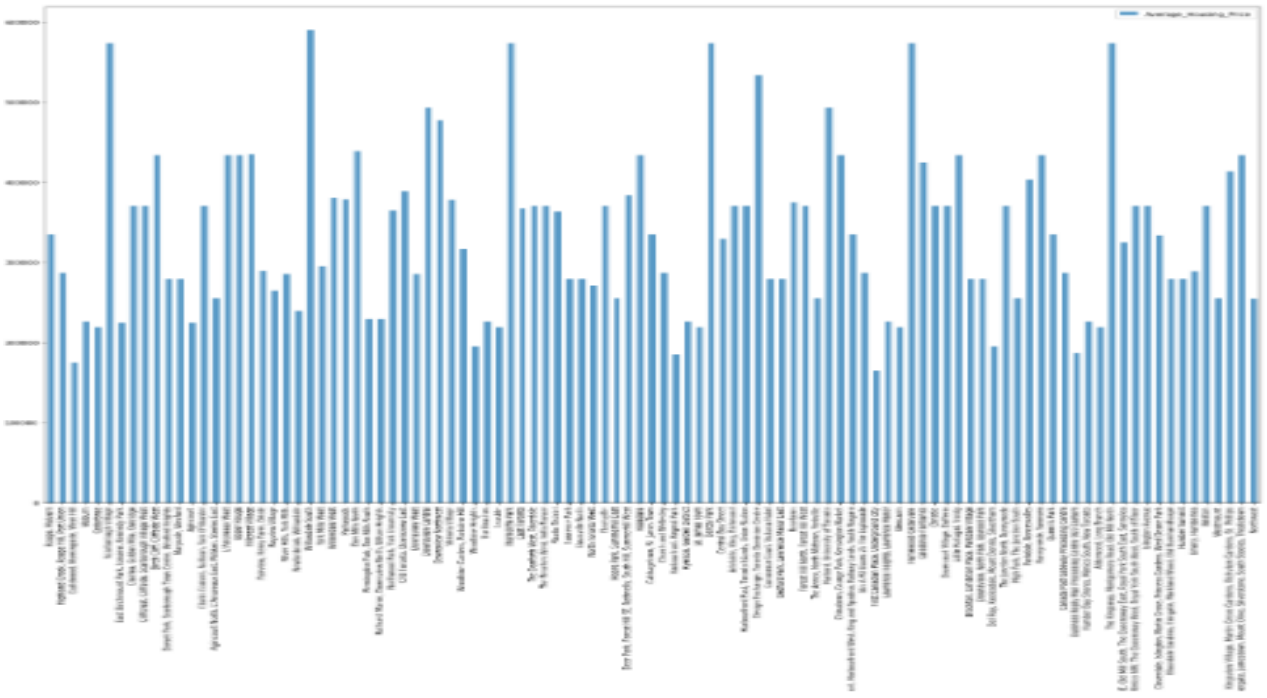

Figure 5: Chart data of Scarborough House prices

Scarborough School ratings and reviews

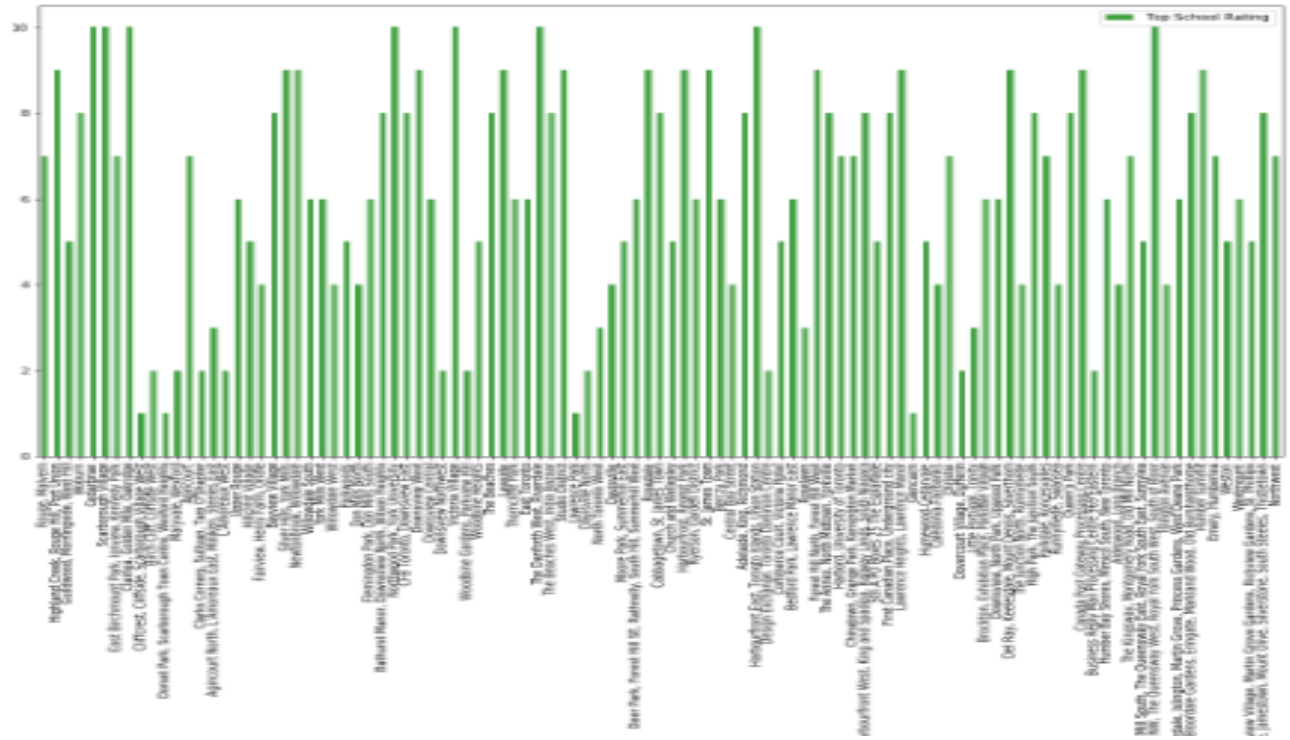

Figure 6: Chart of Scarborough schools

5. Discussion

Figure 1shows the map of Scarborough, Toronto and its neighborhood. Figure 2 shows the result obtained after using the cluster approach which listed the venues in Scarborough, Toronto. The venues listed include coffee shop, restaurant, electronic stores, yoga studio, bank, bakery etc. Figure 3 depicts the similar or common venues in the neighborhood in Scarborough, Toronto. Figure 4 depicts clusters of similar venues of facilities or amenities present in Scarborough, Toronto. Figure 5 shows the chart data of average house pricing of each neighborhood in Scarborough. Figure 6 shows the schools rating chart

6. Conclusion

In this Capstone project, using k-means cluster algorithm the neighborhood has been separated into 10(Ten) different clusters from dataset, which have very-similar neighborhoods around them. Charts presented in the result sections shows the average house prices and school rating based on each neighborhood.