The Battle of Neighborhoods | Business Problem | Introduction

1. Introduction:

- The purpose of this Project is to help people in exploring better facilities around their neighborhood. It will help people making smart and efficient decision on selecting great neighborhood out of numbers of other neighborhoods in Scarborough, Toranto.

- Lots of people are migrating to various states of Canada and needed lots of research for good housing prices and reputated schools for their children. This project is for those people who are looking for better neighborhoods. For ease of accessing to Cafe, School, Super market, medical shops, grocery shops, mall, theatre, hospital, like minded people, etc.

- This Project aim to create an analysis of features for a people migrating to Scarborough to search a best neighborhood as a comparative analysis between neighborhoods. The features include median housing price and better school according to ratings, crime rates of that particular area, road connectivity, weather conditions, good management for emergency, water resources both freash and waste water and excrement conveyed in sewers and recreational facilities. It will help people to get awareness of the area and neighborhood before moving to a new city, state, country or place for their work or to start a new fresh life.
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1.1 Problem:

- The major purpose of this project, is to suggest a better neighborhood in a new city for the person who are shiffting there.
    1. Sorted list of house in terms of housing prices in a ascending or descending order.
    2. Sorted list of schools in terms of location, fees, rating and reviews

2. Data:

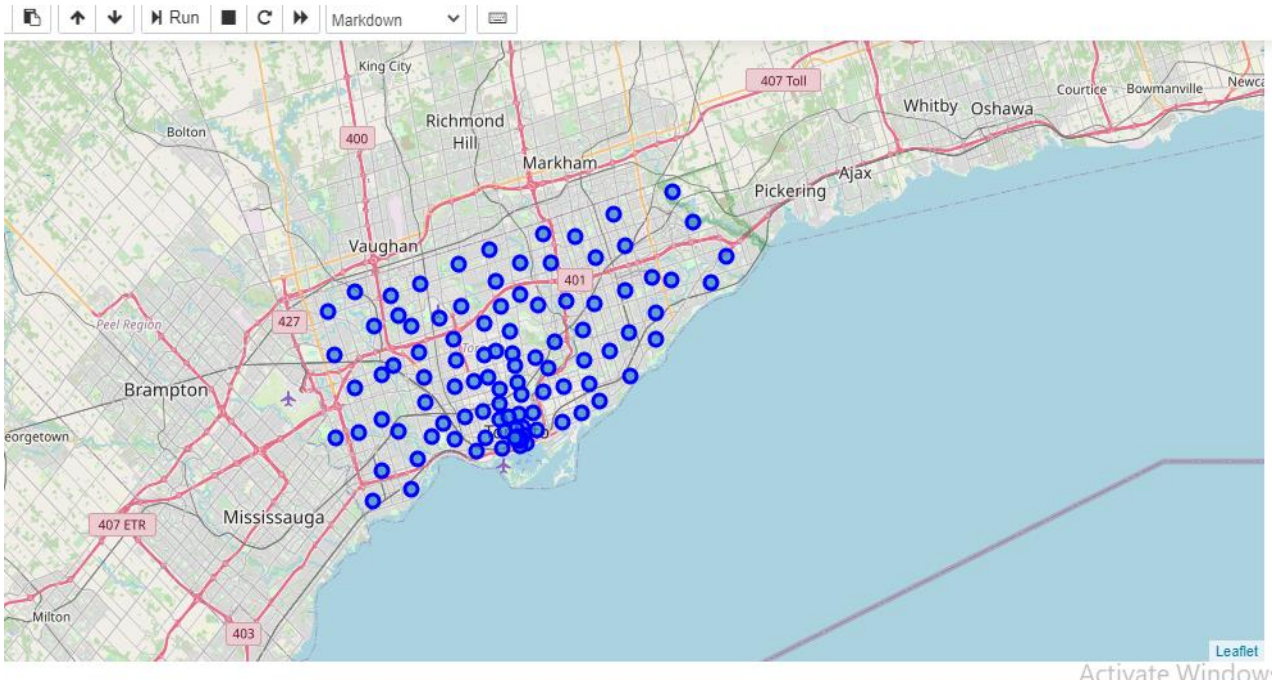
Data Link: https://en.wikipedia.org/wiki/List_of_postal_codes_of_Canada:_M

After scrapping from wikipedia we will get:

1. Postal Code
2. Borough
3. Neighbourhood

Foursquare API Data:

- We will need data about different venues in different neighborhoods of that specific borough. In order to gain that information we will use "Foursquare" locational information.
- The Foursquare Places API provides location based experiences with diverse information about venues, users, photos, and check-ins. The API supports real time access to places, Snap-to-Place that assigns users to specific locations, and Geo-tag.
- After finding the list of neighborhoods, we then connect to the Foursquare API to gather information about venues inside each and every neighborhood.
- We will obtain following information as per venue:
    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

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.

Most Common venues near Neighborhood4

Out[47]:

	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	Agincourt	Chinese Restaurant	Shopping Mall	Pizza Place	Skating Rink	Pool Hall	Supermarket	Sushi Restaurant	Sandwich Place	Discount Store	Bank
1	Alderwood, Long Branch	Pizza Place	Print Shop	Gas Station	Coffee Shop	Gym	Pub	Sandwich Place	Pool	Cosmetics Shop	Elementary School
2	Bathurst Manor, Wilson Heights, Downsview North	Park	Convenience Store	Other Great Outdoors	Doner Restaurant	Dumpling Restaurant	Eastern European Restaurant	Electronics Store	Elementary School	Escape Room	Ethiopian Restaurant
3	Bayview Village	Dog Run	Asian Restaurant	Trail	Park	Ethiopian Restaurant	Dumpling Restaurant	Eastern European Restaurant	Electronics Store	Elementary School	Escape Room
4	Bedford Park, Lawrence Manor East	Coffee Shop	Pizza Place	Italian Restaurant	Sandwich Place	Intersection	Butcher	Sports Club	Thai Restaurant	Pub	Café

Using K-Means Clustering Approach

t[49]:

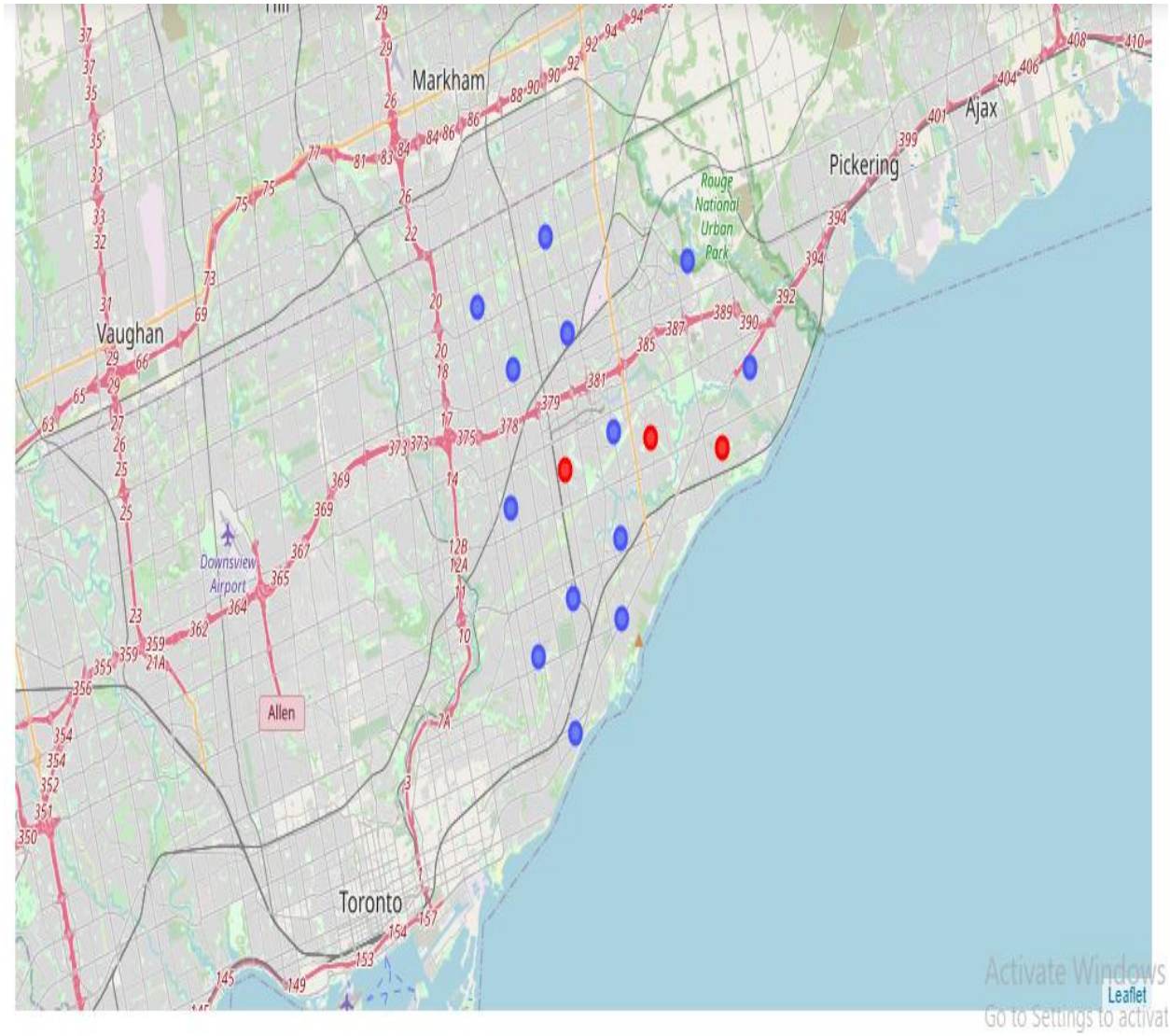
	Postalcode	Borough	Neighborhood	Latitude	Longitude	Cluster Labels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8 C
0	M1B	Scarborough	Malvern, Rouge	43.81153	-79.19552	2	Zoo Exhibit	Financial or Legal Service	Paintball Field	Fast Food Restaurant	Ethiopian Restaurant	Dumpling Restaurant	Eastern European Restaurant	Ele
1	M1C	Scarborough	Rouge Hill, Port Union, Highland Creek	43.78564	-79.15871	2	Construction & Landscaping	Home Service	Fish & Chips Shop	Bar	Falafel Restaurant	Eastern European Restaurant	Electronics Store	Ele
2	M1E	Scarborough	Guildwood, Morningside, West Hill	43.76575	-79.17520	0	Park	Athletics & Sports	Gym / Fitness Center	Yoga Studio	Ethiopian Restaurant	Dumpling Restaurant	Eastern European Restaurant	Ele
3	M1G	Scarborough	Woburn	43.76820	-79.21761	0	Coffee Shop	Chinese Restaurant	Fast Food Restaurant	Park	Ethiopian Restaurant	Dumpling Restaurant	Eastern European Restaurant	Ele
4	M1H	Scarborough	Cedarbrae	43.76969	-79.23944	2	Thai Restaurant	Indian Restaurant	Gas Station	Caribbean Restaurant	Bank	Bakery	Athletics & Sports	Re

Work Flow:

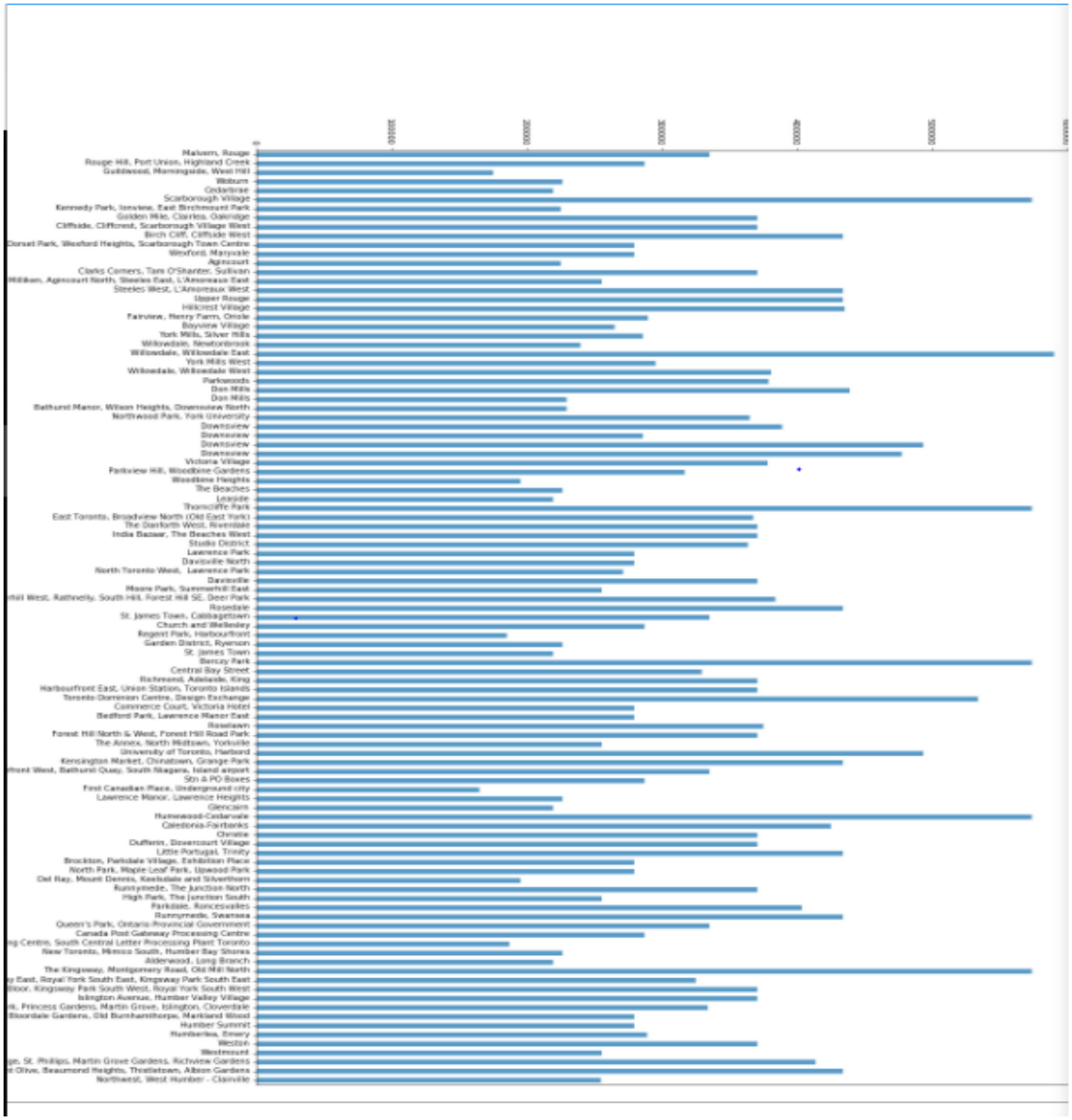
Using credentials of Foursquare API features of near-by places of the neighborhoods would be mined. Due to http request limitations the number of places per neighborhood parameter would reasonably be set to 100 and the radius parameter would be set to 500.

4. Results

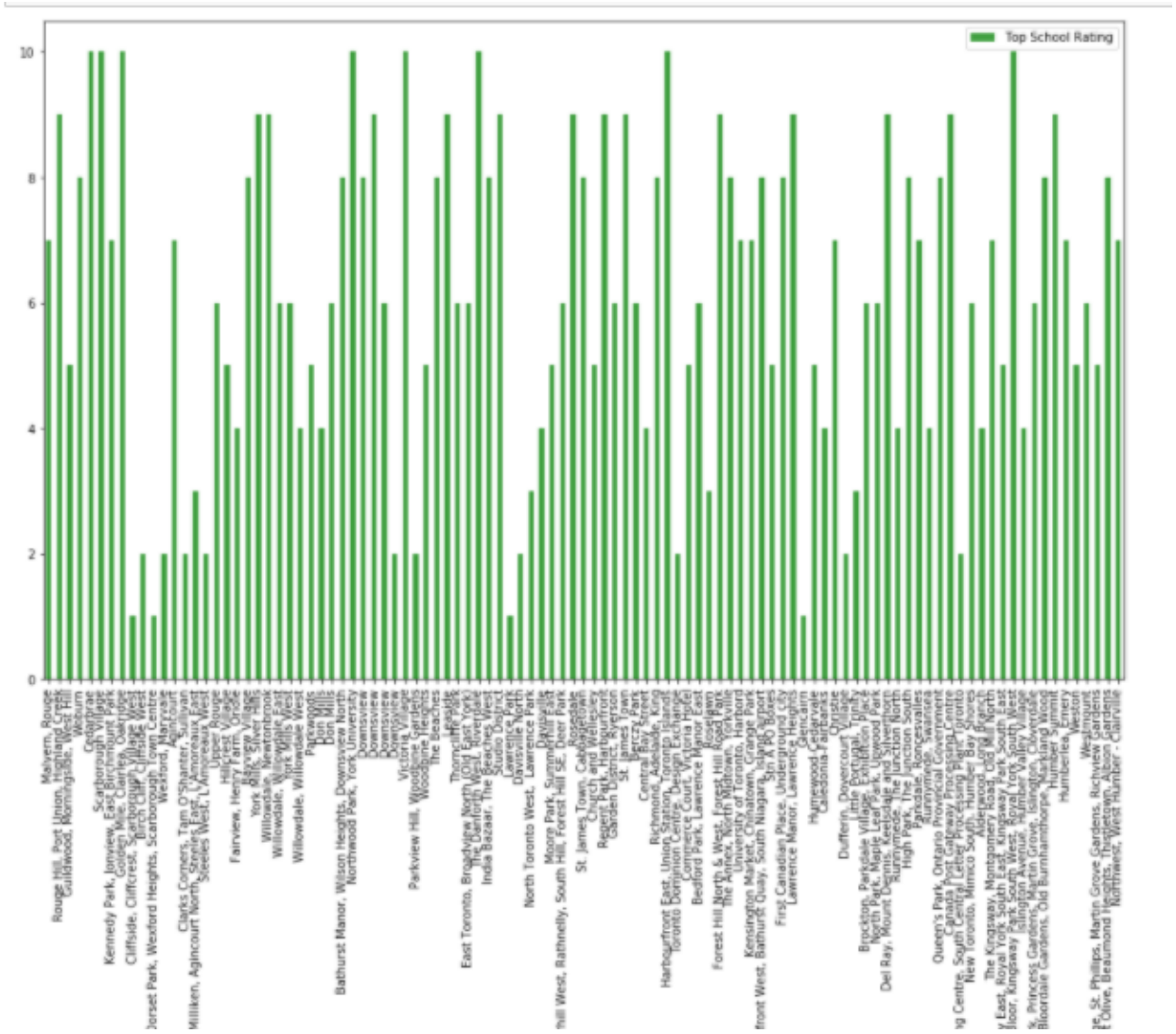
Map of Clusters in Scarborough



Average Housing Price by Clusters in Scarborough


Malvern, Rouge
Rouge Hill, Port Union, Highland Creek
Guildwood, Morningside, West Hill
Woburn
Cedarbrae
Scarborough Village
Kennedy Park, Ionview, East Birchmount Park
Golden Mile, Clairlea, Oakridge
Cliffside, Cliffcrest, Scarborough Village West
Birch Cliff, Cliffside West
Dorset Park, Wexford Heights, Scarborough Town Centre
Wexford, Maryvale
Agincourt
Clarks Corners, Tam O'Shanter, Sullivan
Milliken, Agincourt North, Steeles East, L'Amoreaux East
Steeles West, L'Amoreaux West
Upper Rouge
Hillcrest Village
Fairview, Henry Farm, Oriole
Bayview Village
York Mills, Silver Hills
Willowdale, Newtonbrook
Willowdale, Willowdale East
York Mills West
Willowdale, Willowdale West
Parkwoods
Don Mills
Don Mills
Bathurst Manor, Wilson Heights, Downsview North
Northwood Park, York University
Downsview
Downsview
Downsview
Downsview
Victoria Village
Parkview Hill, Woodbine Gardens
Woodbine Heights
The Beaches
Leaside
Thorncliffe Park
East Toronto, Broadview North (Old East York)
The Danforth West, Riverdale
India Bazaar, The Beaches West
Studio District
Lawrence Park
Dawsville North
North Toronto West, Lawrence Park
Dawsville
Moore Park, Summerhill East
mill West, Rathnelly, South Hill, Forest Hill SE, Deer Park
Rosedale
St. James Town, Cabbagetown
Church and Wellesley
Regent Park, Harbourfront
Garden District, Ryerson
St. James Town
Bercuy Park
Central Bay Street
Richmond, Adelaide, King
Harbourfront East, Union Station, Toronto Islands
Toronto Dominion Centre, Design Exchange
Commerce Court, Victoria Hotel
Bedford Park, Lawrence Manor East
Roselawn
Forest Hill North & West, Forest Hill Road Park
The Annex, North Midtown, Yorkville
University of Toronto, Harbord
Kensington Market, Chinatown, Grange Park
rfront West, Bathurst Quay, South Niagara, Island airport
Stn A PO Boxes
First Canadian Place, Underground city
Lawrence Manor, Lawrence Heights
Glencairn
Runnymead-Cedarvale
Caledonia-Fairbanks
Christie
Dufferin, Dovercourt Village
Little Portugal, Trinity
Brockton, Parkdale Village, Exhibition Place
North Park, Maple Leaf Park, Upwood Park
Old Rep, Mount Dennis, Keelsdale and Silverthorn
Runnymede, The Junction North
High Park, The Junction South
Parkdale, Roncesvalles
Runnymede, Swansea
Queen's Park, Ontario Provincial Government
Canada Post Gateway Processing Centre
g Centre, South Central Letter Processing Plant Toronto
New Toronto, Mimico South, Humber Bay Shores
Alderwood, Long Branch
The Kingsway, Montgomery Road, Old Mill North
y East, Royal York South East, Kingsway Park South East
Mor, Kingsway Park South West, Royal York South West
Islington Avenue, Humber Valley Village
k, Princess Gardens, Martin Grove, Islington, Cloverdale
Eloordale Gardens, Old Burnhamthorpe, Markland Wood
Humber Summit
Humberlea, Emery
Weston
Westmount
ge, St. Phillips, Martin Grove Gardens, Richview Gardens
t Olive, Beaumond Heights, Thistletown, Albion Gardens
Northwest, West Humber - Clairville

School Ratings by Clusters in Scarborough



The Location:

Scarborough is a popular destination for new immigrants in Canada to reside. As a result, it is one of the most diverse and multicultural areas in the Greater Toronto Area, being home to various religious groups and places of worship. Although immigration has become a hot topic over the past few years with more governments seeking more restrictions on immigrants and refugees, the general trend of immigration into Canada has been one of on the rise.

Foursquare API:

This project have used Four-square API as its prime data 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.

5. Discussion

The major purpose of this project, is to suggest a better neighborhood in a new city for the person who are shiffting there. Social presence in society in terms of like minded people. Connectivity to the airport, bus stand, city center, markets and other daily needs things nearby.

1. Sorted list of house in terms of housing prices in a ascending or descending order
2. Sorted list of schools in terms of location, fees, rating and reviews

6. Conclusion

In this project, using k-means cluster algorithm I separated the neighborhood into 10(Ten) different clusters and for 103 different lattitude and logitude from dataset, which have very-similar neighborhoods around them. Using the charts above results presented to a particular neighborhood based on average house prices and school rating have been made.

Future Works:

This project can be continued for making it more precise in terms to find best house in Scarborough. Best means on the basis of all required things(daily needs or things we need to live a better life) around and also in terms of cost effective.