Find My Neighborhood

Introduction

Since couple of decades Canada has been welcoming immigrants from across the world in great numbers. The increase in immigration has been motivated by the economic needs of the country which is blooming by leaps and bounds. According to U.N. basis immigration rate Canada with 7.6 mn immigrants (21% of overall population) features at fourth position, after UAE, Saudi Arabia and Australia. Motto of this Capstone Project is to enable persons to explore their respective neighborhood before moving to a place for the purpose of stay. The said project helps an user to scope neighborhoods in and around Scarborough, Toronto. The choice of neighborhoods primarily depends on availability of school, medical facilities, super market, transport facilities, recreation ground, movie theatre, mall etc. which ultimately justifies the housing price of the respective locality. The project will help with a comparative analysis of different neighborhoods w.r.t the above mentioned parameters.
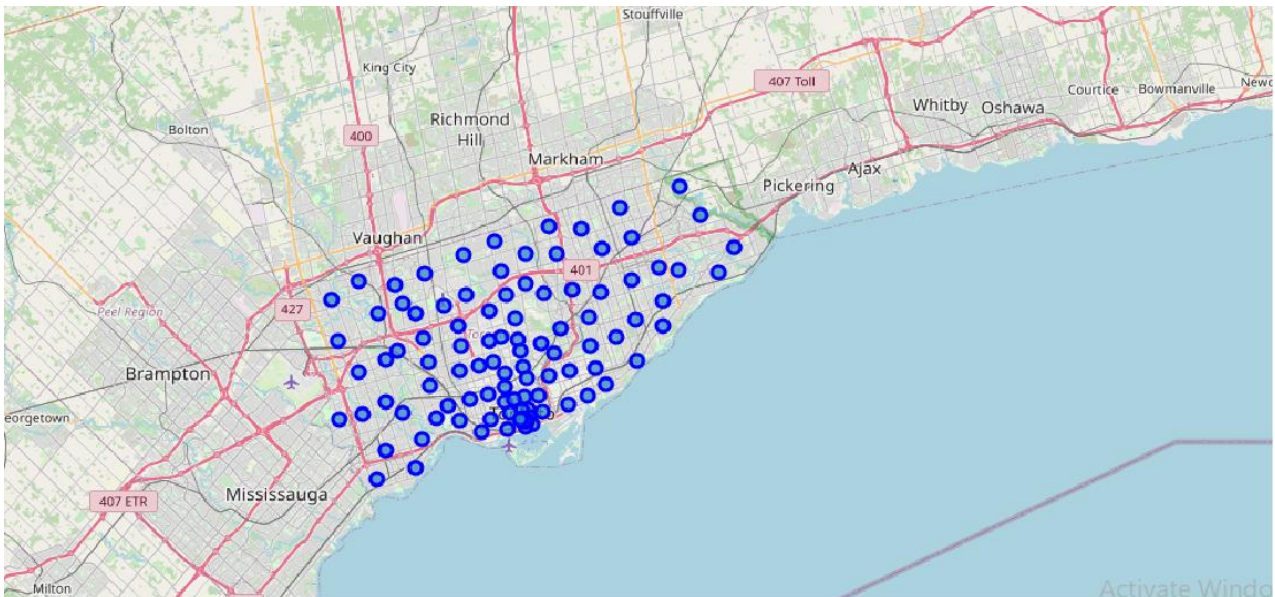
Project Proposal

Problem Statement:-

An immigrant who has been offered a job in Toronto, Ontario, Canada is looking for a suitable neighborhood for stay. The person would be staying with family, thus is looking for good schools in proximity, medical facilities and other essential conveniences for livelihood. Naturally price is also an important factor in deciding the most apt neighborhood. Thus a comparative analysis of different neighborhood w.r.t key features like school, hospitals, medical shops, super markets, recreation ground, theatre etc.

Problem Statement:-

To address the stated problem, one model needs to be prepared which will populate different types of venues in a particular neighborhood and thereafter would also help to project a comparative analysis amongst neighborhoods w.r.t availability of venues (or facilities) in certain predefined radius of the neighborhoods

Selection of Data source

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

From the above source Dataset of Scarborough consisting of latitude and longitude, zip codes have been extracted and used for analysis in this project.

Application Interface: Foursquare API Data: -

It helps to access firmographic and rich, user-generated content such as photos, ratings, and reviews of particular venue via API.

With the help of Foursquare API data of different venues have been extracted and put to use in analysis. After finding the list of neighborhoods, information about venues inside each and every neighborhood have been gathered using the Foursquare API, we have chosen the radius to be 100 meters.
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:

Venue
- Venue Name
- Venue Latitude & Longitude
- Venue Category
- Neighborhood
- Latitude & Longitude of Neighborhood
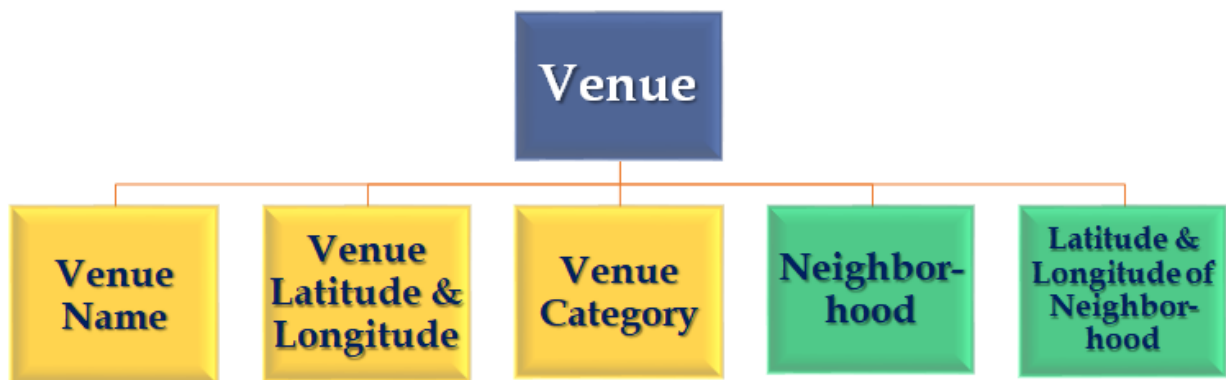
Application Methods

Clustering Approach

Objective is to explore and compare the neighborhoods and segment them accordingly into clusters. Clustering approach, which is a type of unsupervised machine learning algorithm, has been used for the same.

Application of K-means Clustering

	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	Supermarket	Bakery	Bank	Clothing Store	Skating Rink	Japanese Restaurant	Sushi Restaurant	Filipino Restaurant
1	Alderwood, Long Branch	Convenience Store	Pub	Gas Station	Athletics & Sports	Coffee Shop	Gym	Sandwich Place	Pool	Print Shop	Pizza Place
2	Bathurst Manor, Wilson Heights, Downsview North	Park	Convenience Store	Other Great Outdoors	Creperie	Falafel Restaurant	Dumpling Restaurant	Eastern European Restaurant	Electronics Store	Elementary School	Ethiopian Restaurant
3	Bayview Village	Dog Run	Flower Shop	Park	Asian Restaurant	Trail	Ethiopian Restaurant	Dumpling Restaurant	Eastern European Restaurant	Electronics Store	Elementary School
4	Bedford Park, Lawrence Manor East	Italian Restaurant	Pizza Place	Coffee Shop	Restaurant	Sandwich Place	Thai Restaurant	Comfort Food Restaurant	Intersection	Pet Store	Pub

	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
0	M1B	Scarborough	Malvern, Rouge	43.81153	-79.19552	1	Zoo Exhibit	Fast Food Restaurant	Electronics Store	Construction & Landscaping	History Museum	Event Space
1	M1C	Scarborough	Rouge Hill, Port Union, Highland Creek	43.78564	-79.15871	2	Bar	Fish & Chips Shop	Yoga Studio	Falafel Restaurant	Eastern European Restaurant	Electronics Store
2	M1E	Scarborough	Guildwood, Morningside, West Hill	43.76575	-79.17520	0	Park	Athletics & Sports	Gym / Fitness Center	Yoga Studio	Doner Restaurant	Dumpling Restaurant
3	M1G	Scarborough	Woburn	43.76820	-79.21761	1	Coffee Shop	Chinese Restaurant	Park	Fast Food Restaurant	Event Space	Dumpling Restaurant
4	M1H	Scarborough	Cedarbrae	43.76969	-79.23944	1	Thai Restaurant	Indian Restaurant	Bakery	Flower Shop	Caribbean Restaurant	Gas Station

# Outcome
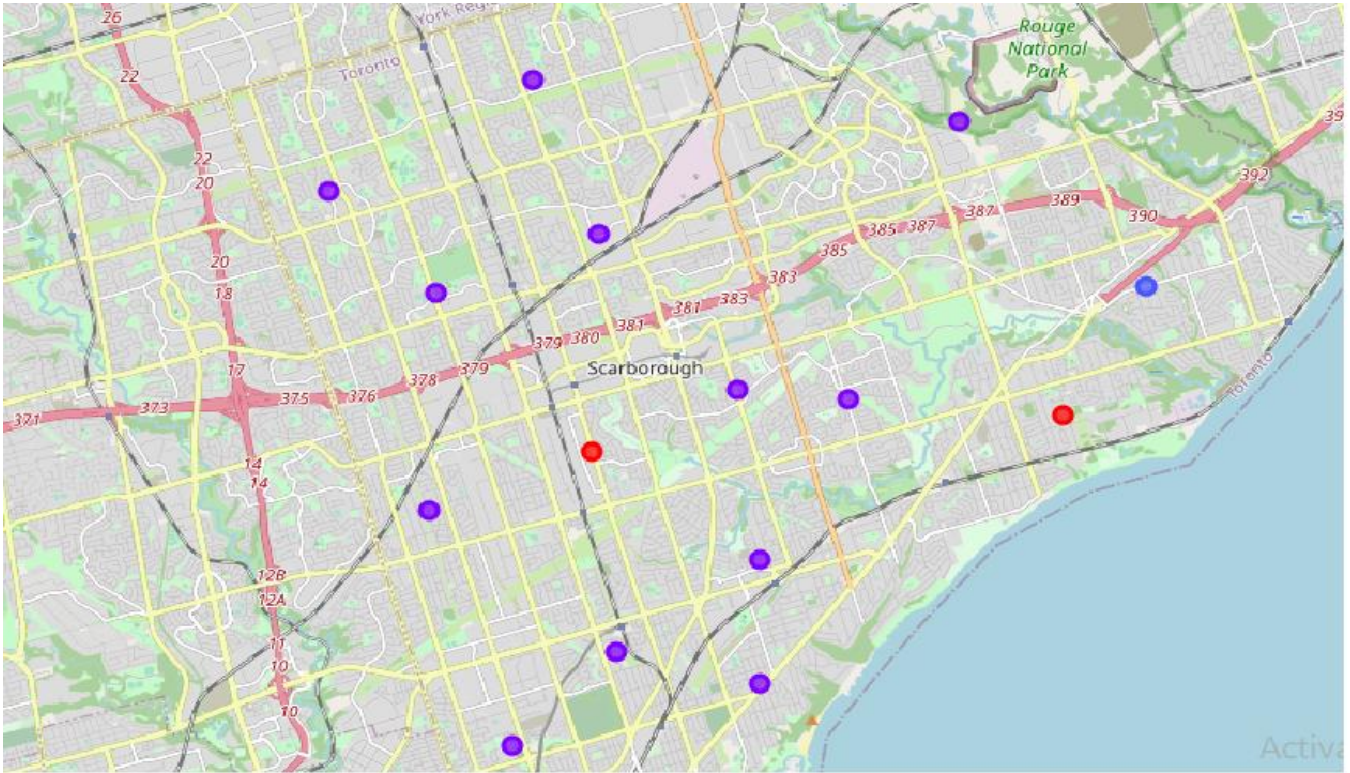
Scarborough is an administrative division of Toronto, Ontario, Canada. The vast majority of Scarborough's population is composed of immigrants who have arrived in the last four decades, and their descendants. In 2006, 57% of residents were foreign-born.

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.

Average housing price of Scarborough
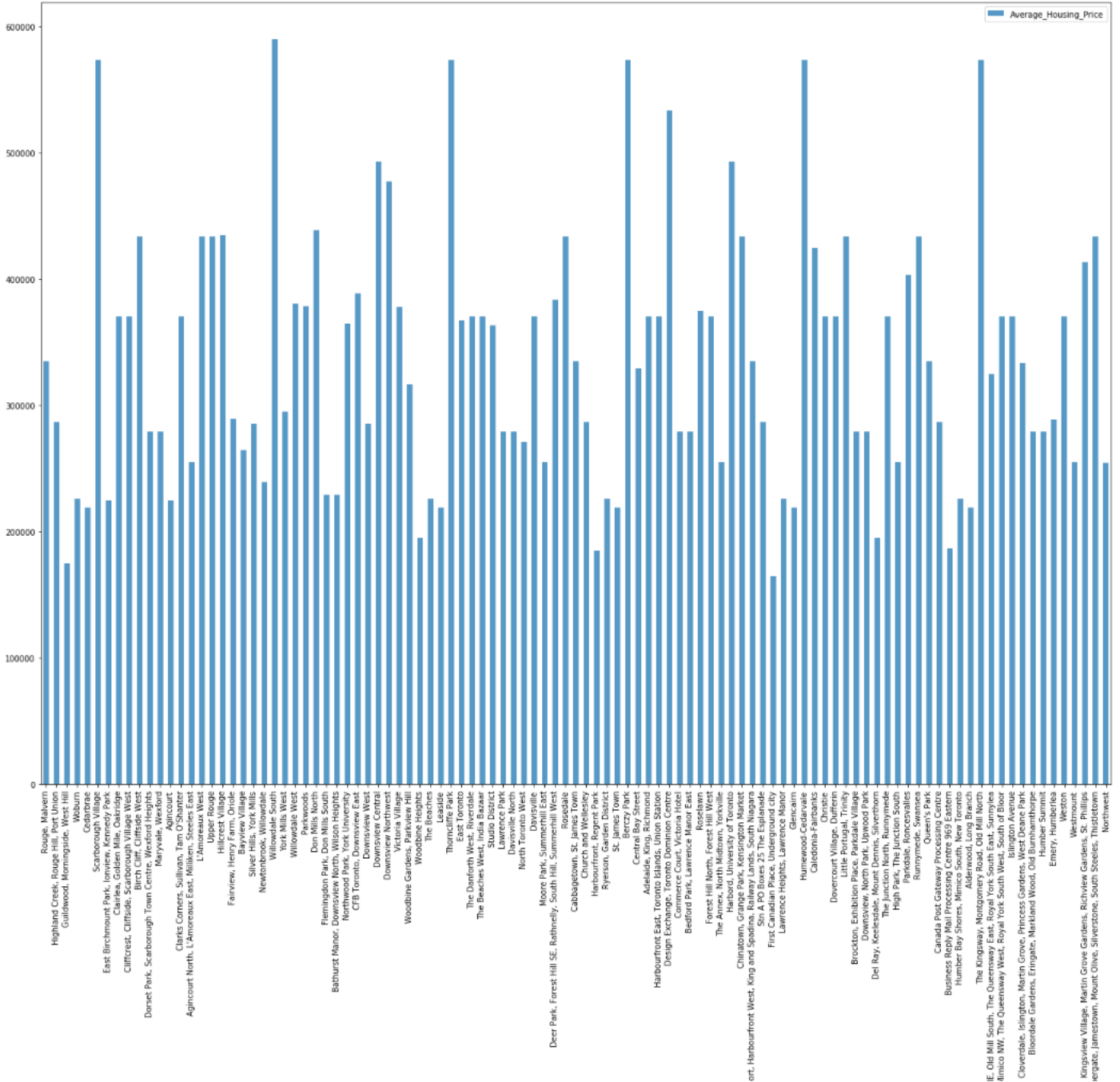
Average school rating of Scarborough
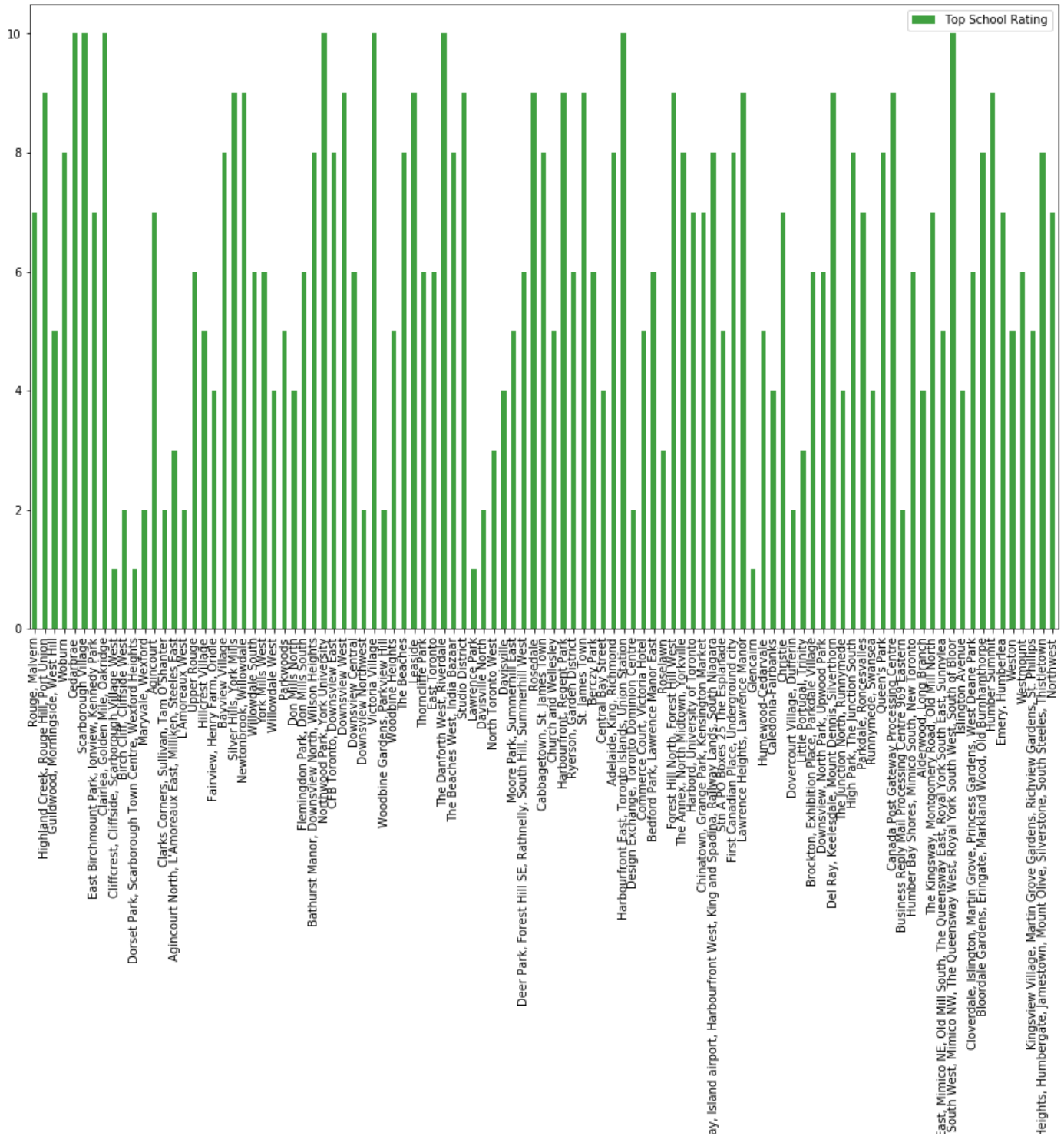
Discussion & Conclusion

In this project, k-means cluster algorithm has been used to segment the neighbourhoods into ten different clusters and for 103 different latitudes and longitudes from dataset, basis the similarity. The aforementioned charts denotes the average house prices and school rating of a particular neighbourhood. With the help of this project comparative analysis of neighbourhoods w.r.t essential facilities, logistics, ethnicity etc. can be done which is of great use while selecting place of stay.