

# **Final Report : Capstone Project The Battle of Neighborhoods & Finding a better place to live and better school to attend**

## **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, Toronto.

Lots of people are migrating to various states of Canada and needed lots of research for good housing prices and reputed 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 fresh 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.

## **2. Data Section**

Data Link: [https://en.wikipedia.org/wiki/List\\_of\\_postal\\_codes\\_of\\_Canada](https://en.wikipedia.org/wiki/List_of_postal_codes_of_Canada): M

Will use Scarborough dataset which we scrapped from wikipedia on Week 3. Dataset consisting of latitude and longitude, zip codes.

### **Foursquare API Data:**

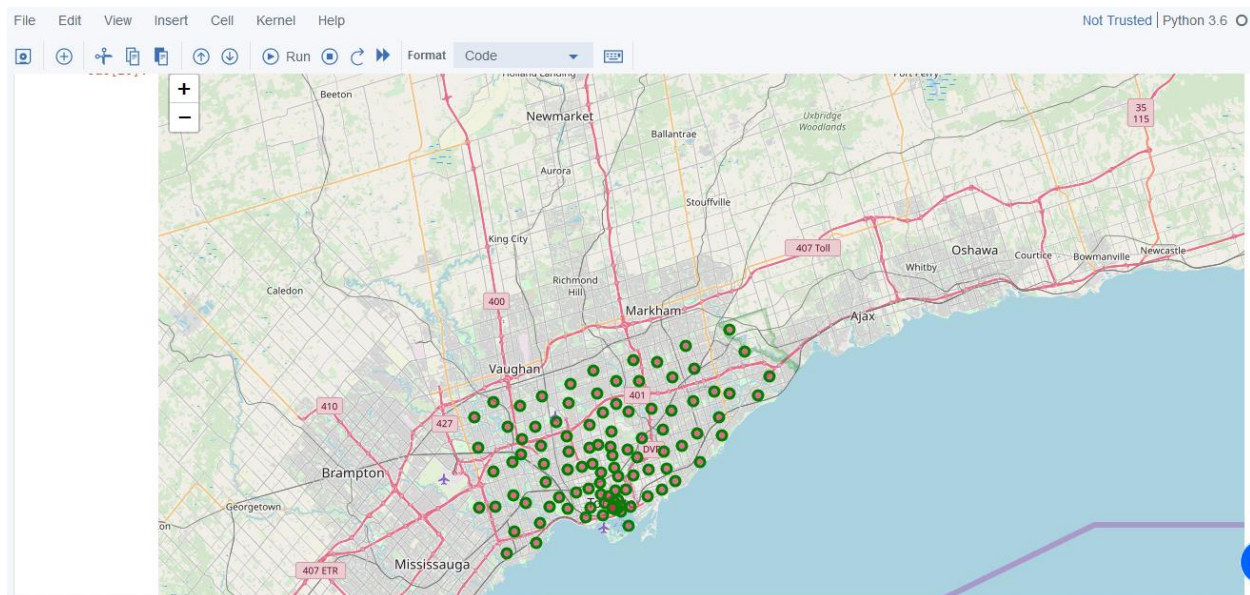
We will need data about different venues in different neighborhoods of that specific borough. In order to gain that information we will use "Foursquare" locational information. Foursquare is a location data provider with information about all manner of venues and events within an area of interest. Such information includes venue names, locations, menus and even photos. As such, the foursquare location platform will be used as the sole data source since all the stated required information can be obtained through the API.

After finding the list of neighborhoods, we then connect to the Foursquare API to gather information about venues inside each and every neighborhood. For each neighborhood, we have chosen the radius to be 100 meter.

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

## Map of Scarborough



## 3. Methodology Section

### 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.

### Using K-Means Clustering Approach

```
neighborhoods_venues_sorted.insert(0, 'Cluster Labels', kmeans.labels_)

Scarborough_merged = df_2.iloc[:16,:]

Scarborough_merged = Scarborough_merged.join(neighborhoods_venues_sorted.set_index('Neighborhood'), on='Neighborhood')

Scarborough_merged.head()
```

ut[37]:

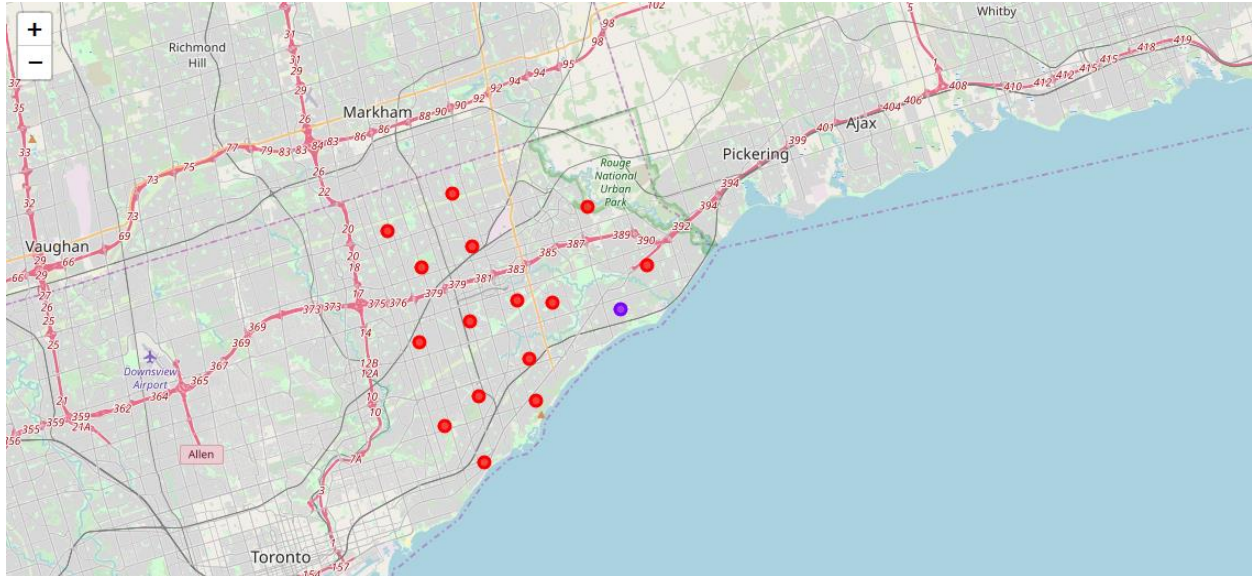
	Postalcode	Borough	Neighborhood	Latitude	Longitude	Cluster Labels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue	9th Most Common Venue	10th Most Common Venue
0	M1B	Scarborough	Rouge, Malvern	43.811525	-79.195517	0	Zoo Exhibit	Fast Food Restaurant	Farmers Market	Construction & Landscaping	Historic Site	Event Space	Doner Restaurant	Donut Shop	Dumpling Restaurant	Eastern European Restaurant
1	M1C	Scarborough	Highland Creek, Rouge Hill, Port Union	43.785665	-79.158725	0	Bar	Fish & Chips Shop	Yoga Studio	Falafel Restaurant	Donut Shop	Dumpling Restaurant	Eastern European Restaurant	Electronics Store	Ethiopian Restaurant	Electronics Store
2	M1E	Scarborough	Guildwood, Morningside, West Hill	43.765815	-79.175193	1	Park	Gym / Fitness Center	Athletics & Sports	Yoga Studio	Ethiopian Restaurant	Doner Restaurant	Donut Shop	Dumpling Restaurant	Eastern European Restaurant	Electronics Store
3	M1G	Scarborough	Woburn	43.768369	-79.217590	0	Coffee Shop	Fast Food Restaurant	Business Service	Park	Yoga Studio	Donut Shop	Dumpling Restaurant	Eastern European Restaurant	Electronics Store	Ethiopian Restaurant
4	M1H	Scarborough	Cedarbrae	43.769688	-79.239440	0	Thai Restaurant	Indian Restaurant	Flower Shop	Bank	Bakery	Gas Station	Caribbean Restaurant	Hakka Restaurant	Athletics & Sports	Local Business

### Most Common venues near Neighborhood

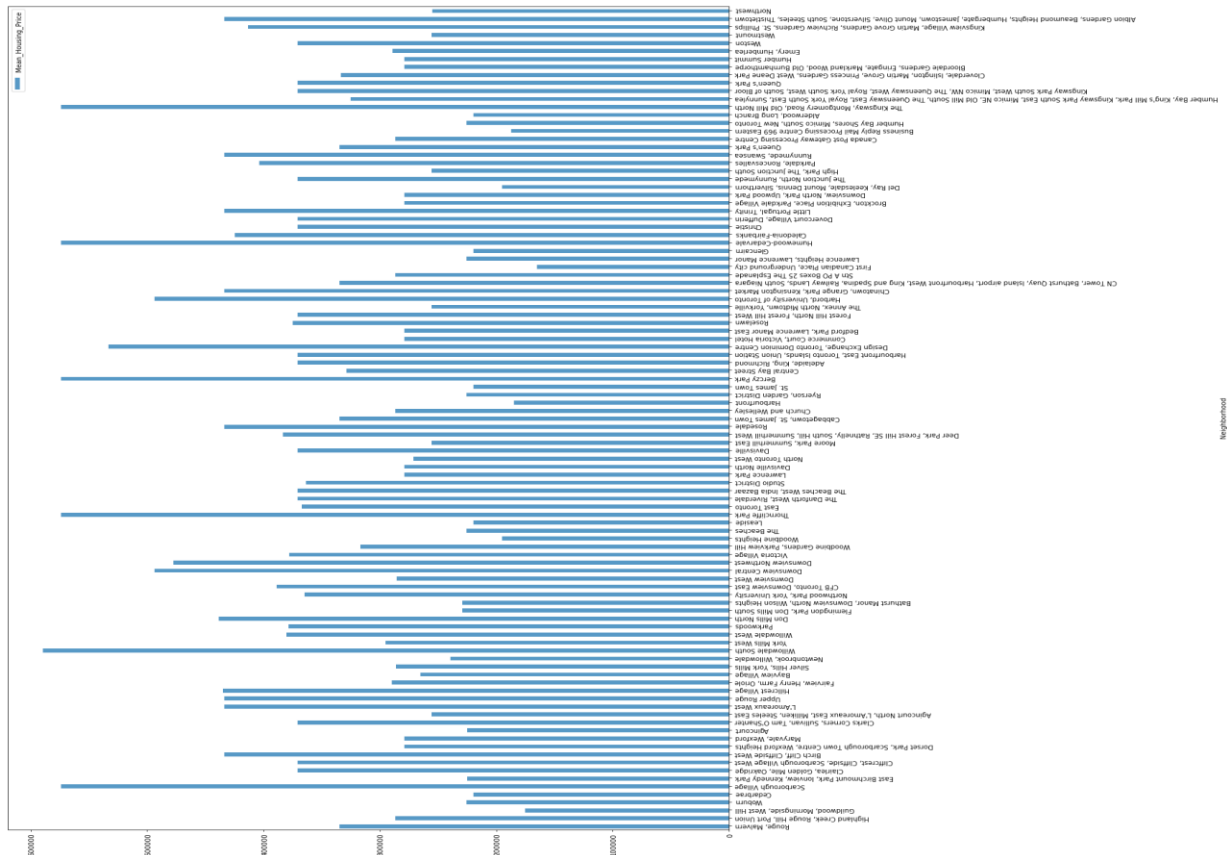
	Neighborhood	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue	9th Most Common Venue	10th Most Common Venue
0	Adelaide, King, Richmond	Coffee Shop	Café	Hotel	Steakhouse	Breakfast Spot	Bar	Restaurant	Gastropub	Asian Restaurant	Italian Restaurant
1	Agincourt	Shopping Mall	Chinese Restaurant	Pizza Place	Seafood Restaurant	Supermarket	Breakfast Spot	Bubble Tea Shop	Malay Restaurant	Skating Rink	Shanghai Restaurant
2	Agincourt North, L'Amoreaux East, Milliken, St...	Sandwich Place	Pharmacy	Sushi Restaurant	Filipino Restaurant	Ethiopian Restaurant	Dog Run	Doner Restaurant	Donut Shop	Dumpling Restaurant	Eastern European Restaurant
3	Albion Gardens, Beaumont Heights, Humbergate, ...	Grocery Store	Pizza Place	Gym Pool	Liquor Store	Caribbean Restaurant	Fried Chicken Joint	Beer Store	Sandwich Place	Coffee Shop	Park
4	Alderwood, Long Branch	Pizza Place	Pool	Gas Station	Coffee Shop	Gym	Print Shop	Pub	Sandwich Place	Pharmacy	Convenience Store

## 4. Results Section

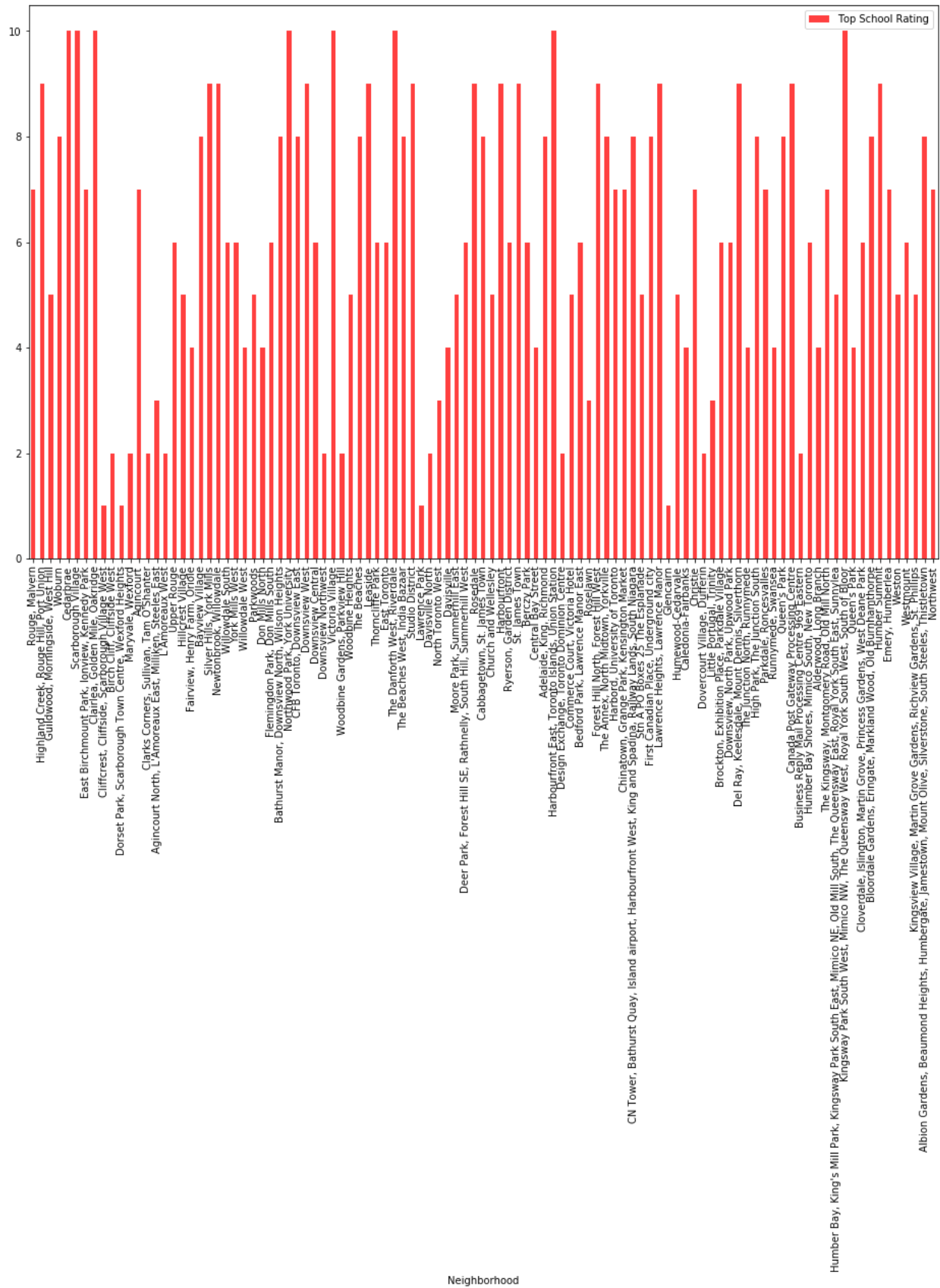
### Map of Clusters in Scarborough



### Average Housing Price by Clusters in Scarborough



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.

## **5. Discussion Section**

### **Problem Which Tried to Solve:**

The major purpose of this project, is to suggest a better neighborhood in a new city for the person who are shifting 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 Section**

In this project, using k-means cluster algorithm I separated the neighborhood into 15 different clusters and for 103 different latitude 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. According to school rating and house pricing Cabbage Town , East Toronto and West Riverdale would be great choice for families to buy house and find a high rating school for the kids