

# Capstone Project: The Battle of Neighborhoods



Scarborough is an administrative district and former city in Toronto, Ontario, Canada. 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. It includes some of Toronto's popular natural landmarks, such as the Toronto Zoo and Rouge Park. The northeast corner of Scarborough is largely rural with some of Toronto's last remaining farms, leading to Scarborough's reputation of being greener than any other part of Toronto

## Business Problem:

The objective of the project is to guide or provide insights to anyone who wants to immigrate to Canada, but has chosen Scarborough to dwell and start its own business. Project will try to segment and cluster areas of Scarborough on the most common places captured from Foursquare. Knowing the neighborhoods/locality and type of business thriving in those venues can aid to narrow down/finalize the business plans.

## Data:

The Postal code data is acquired from below Wikipedia page  
[https://en.wikipedia.org/wiki/List\\_of\\_postal\\_codes\\_of\\_Canada:\\_M](https://en.wikipedia.org/wiki/List_of_postal_codes_of_Canada:_M)

Below is a sample of data after cleaning

	PostalCode	Borough	Neighborhood
0	M1B	Scarborough	Rouge,Malvern
1	M1C	Scarborough	Highland Creek,Rouge Hill,Port Union
2	M1E	Scarborough	Guildwood,Morningside,West Hill
3	M1G	Scarborough	Woburn
4	M1H	Scarborough	Cedarbrae

Latitude/Longitude coordinates are downloaded as csv from below link:  
[http://cocl.us/Geospatial\\_data](http://cocl.us/Geospatial_data)

Below is a sample of data after cleaning

	PostalCode	Borough	Neighborhood	Latitude	Longitude
0	M1B	Scarborough	Rouge,Malvern	43.806686	-79.194353
1	M1C	Scarborough	Highland Creek,Rouge Hill,Port Union	43.784535	-79.160497
2	M1E	Scarborough	Guildwood,Morningside,West Hill	43.763573	-79.188711
3	M1G	Scarborough	Woburn	43.770992	-79.216917
4	M1H	Scarborough	Cedarbrae	43.773136	-79.239476
5	M1J	Scarborough	Scarborough Village	43.744734	-79.239476
6	M1K	Scarborough	East Birchmount Park,Ionview,Kennedy Park	43.727929	-79.262029
7	M1L	Scarborough	Clairlea,Golden Mile,Oakridge	43.711112	-79.284577
8	M1M	Scarborough	Cliffcrest,Cliffside,Scarborough Village West	43.716316	-79.239476
9	M1N	Scarborough	Birch Cliff,Cliffside West	43.692657	-79.264848

Using Folium below map of Scarborough was created.



Foursquare API will be used to get the data to explore the neighborhood.

	Neighborhood	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
0	Rouge,Malvern	43.806686	-79.194353	Wendy's	43.807448	-79.199056	Fast Food Restaurant
1	Highland Creek,Rouge Hill,Port Union	43.784535	-79.160497	Royal Canadian Legion	43.782533	-79.163085	Bar
2	Highland Creek,Rouge Hill,Port Union	43.784535	-79.160497	Affordable Toronto Movers	43.787919	-79.162977	Moving Target
3	Guildwood,Morningside,West Hill	43.763573	-79.188711	Swiss Chalet Rotisserie & Grill	43.767697	-79.189914	Pizza Place
4	Guildwood,Morningside,West Hill	43.763573	-79.188711	G & G Electronics	43.765309	-79.191537	Electronics Store

Methodology:

In this project efforts are to detect areas of Scarborough Venues and their categories. Idea is NOT to target any specific category but to provide whole spectrum of current businesses in the region.

In first step we have collected the required data: location and type (category) of every venue

Second step in analysis was calculation and exploration of venues count across different neighborhood of Scarborough

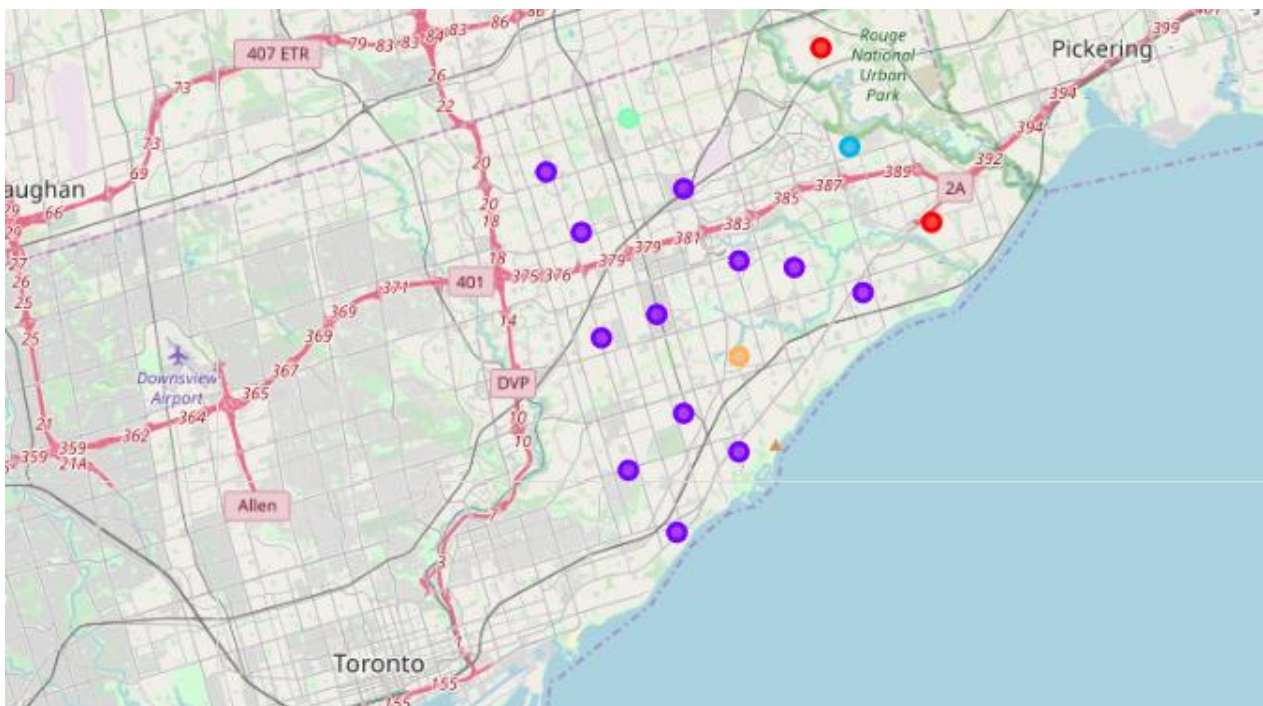
	Neighborhood	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue
0	Agincourt	Skating Rink	Breakfast Spot	Lounge	Clothing Store	Vietnamese Restaurant
1	Agincourt North,L'Amoreaux East,Milliken,Steel...	Park	Playground	Vietnamese Restaurant	Caribbean Restaurant	General Entertainment
2	Birch Cliff,Cliffside West	Café	General Entertainment	Skating Rink	College Stadium	Caribbean Restaurant
3	Cedarbrae	Thai Restaurant	Athletics & Sports	Bakery	Bank	Fried Chicken Joint
4	Clairlea,Golden Mile,Oakridge	Bus Line	Bakery	Metro Station	Soccer Field	Intersection

Third step will be to create clusters (using k-means clustering) of those locations to identify general zones / neighborhoods / addresses where businesses are currently dominating.

	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
0	M1B	Scarborough	Rouge,Malvern	43.806686	-79.194353	2.0	Fast Food Restaurant	Vietnamese Restaurant	Chinese Restaurant	Grocery Store	General Entertainment
1	M1C	Scarborough	Highland Creek,Rouge Hill,Port Union	43.784535	-79.160497	0.0	Bar	Moving Target	Vietnamese Restaurant	Chinese Restaurant	General Entertainment
2	M1E	Scarborough	Guildwood,Morningside,West Hill	43.763573	-79.188711	1.0	Electronics Store	Rental Car Location	Breakfast Spot	Pizza Place	Medical Center
3	M1G	Scarborough	Woburn	43.770992	-79.216917	1.0	Coffee Shop	Insurance Office	Korean Restaurant	Vietnamese Restaurant	Hakka Restaurant
4	M1H	Scarborough	Cedarbrae	43.773136	-79.239476	1.0	Thai Restaurant	Athletics & Sports	Bakery	Bank	Fried Chicken Joint
5	M1J	Scarborough	Scarborough Village	43.744734	-79.239476	4.0	Spa	Playground	Vietnamese Restaurant	Caribbean Restaurant	General Entertainment
6	M1K	Scarborough	East Birchmount Park,Ionview,Kennedy Park	43.727929	-79.262029	1.0	Discount Store	Department Store	Bus Station	Coffee Shop	Train Station

### Result & Discussion:

We have the details of most common venues of each neighborhood in Scarborough. Also results show that most business revolves around cluster1.



### Conclusion:

Purpose of this project was to identify the neighborhoods/locality and types of business thriving in those venues so that any new immigrant with business in mind can aid to narrow down/finalize the business plans.

We see that cluster1 is the epicenter of most business. The stakeholder can utilize this information to jump into the bandwagon of cluster1. Or can utilize the fact that because there are not enough restaurants in other clusters, can pick one of them and proceed further. As an example further classification can be done based on the ethnicity density & population density of the region and and any cluster where the particular ethnic present is larger but not enough restaurants to cater the taste buds, respective category of restaurant should be probably a righteous way to jump start. Final decision is left to the user of this information on how they want it to interpret.