# Finding Neighborhood

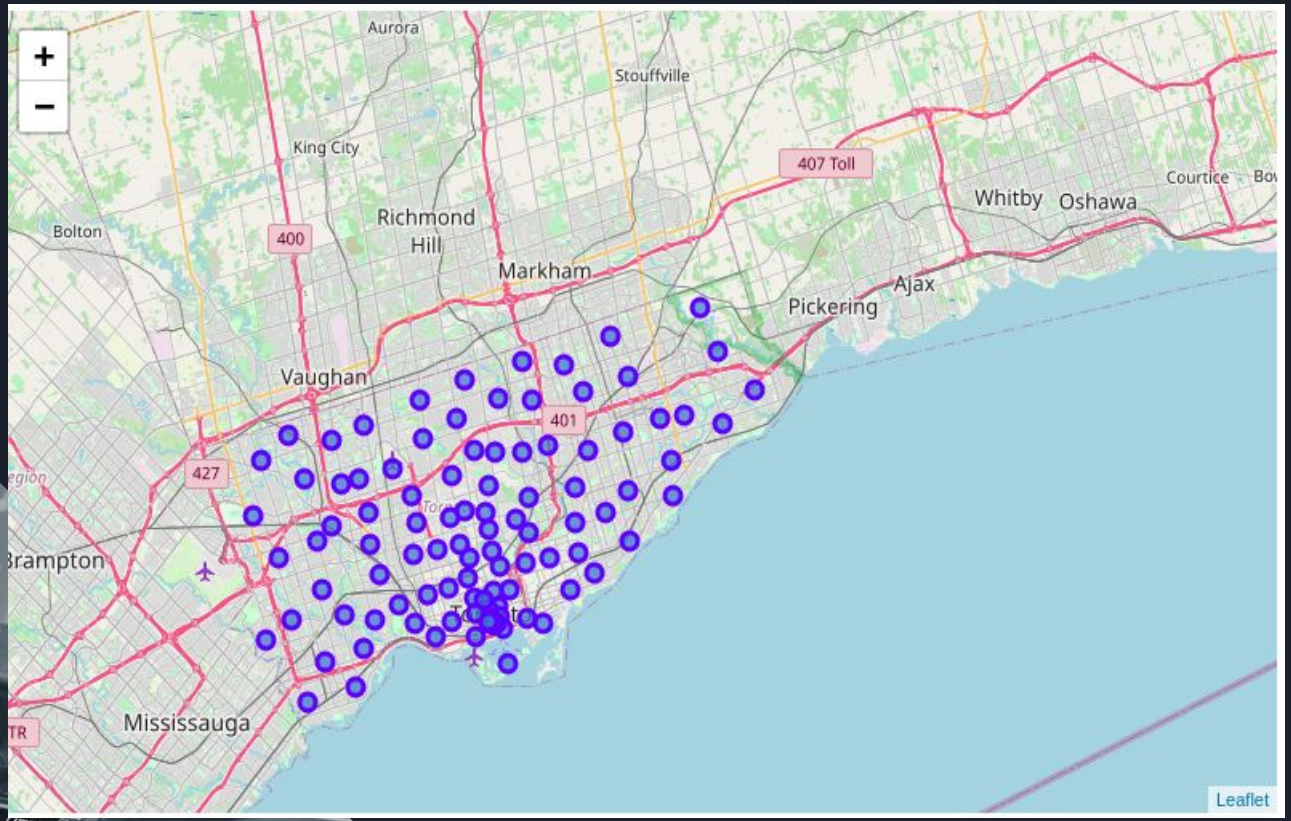
Capstone Project

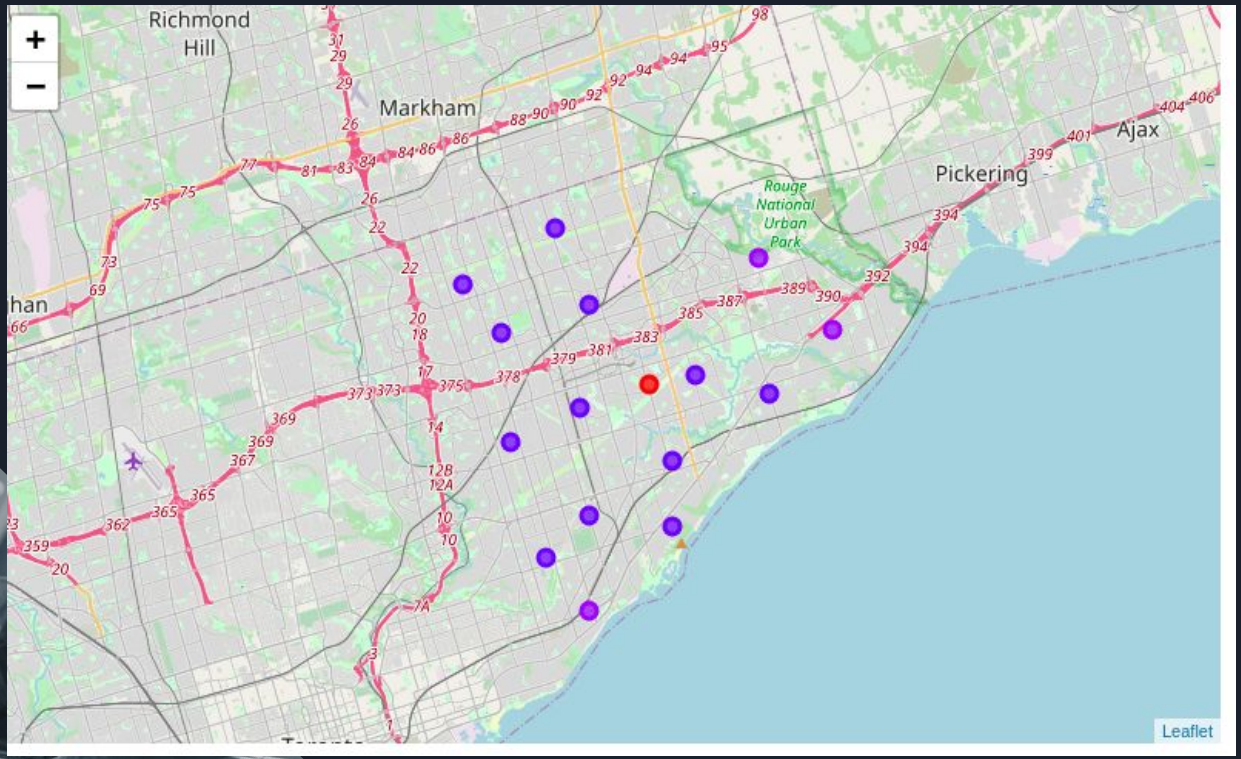
# Methodology

1. Machine Learning(k-means clustering)

2. Exploratory Data Analysis

3. Inferential Analysis


Aurora
Stouffville
King City
407 Toll
Courtice
Whitby
Oshawa
Bolton
400
Richmond Hill
Markham
Ajax
Pickering
Vaughan
401
427
Brampton
Mississauga
Leaflet


Richmond Hill
Markham
Pickering
Ajax
Rouge National Urban Park
Leaflet

# Datasets

| | name | categories | lat | lng |
|---|---|---|---|---|
| 0 | Disney Store | Toy / Game Store | 43.775537 | -79.256833 |
| 1 | SEPHORA | Cosmetics Shop | 43.775017 | -79.258109 |
| 2 | American Eagle Outfitters | Clothing Store | 43.776012 | -79.258334 |
| 3 | St. Andrews Fish & Chips | Fish & Chips Shop | 43.771865 | -79.252645 |
| 4 | Tommy Hilfiger | Clothing Store | 43.776015 | -79.257369 |

| Neighborhood | Neighborhood Latitude | Neighborhood Longitude | Venue | Venue Latitude | Venue Longitude | Venue Category |
|---|---|---|---|---|---|---|
| **Agincourt** | 31 | 31 | 31 | 31 | 31 | 31 |
| **Alderwood / Long Branch** | 10 | 10 | 10 | 10 | 10 | 10 |
| **Bathurst Manor / Wilson Heights / Downsview North** | 24 | 24 | 24 | 24 | 24 | 24 |
| **Bayview Village** | 5 | 5 | 5 | 5 | 5 | 5 |
| **Bedford Park / Lawrence Manor East** | 25 | 25 | 25 | 25 | 25 | 25 |

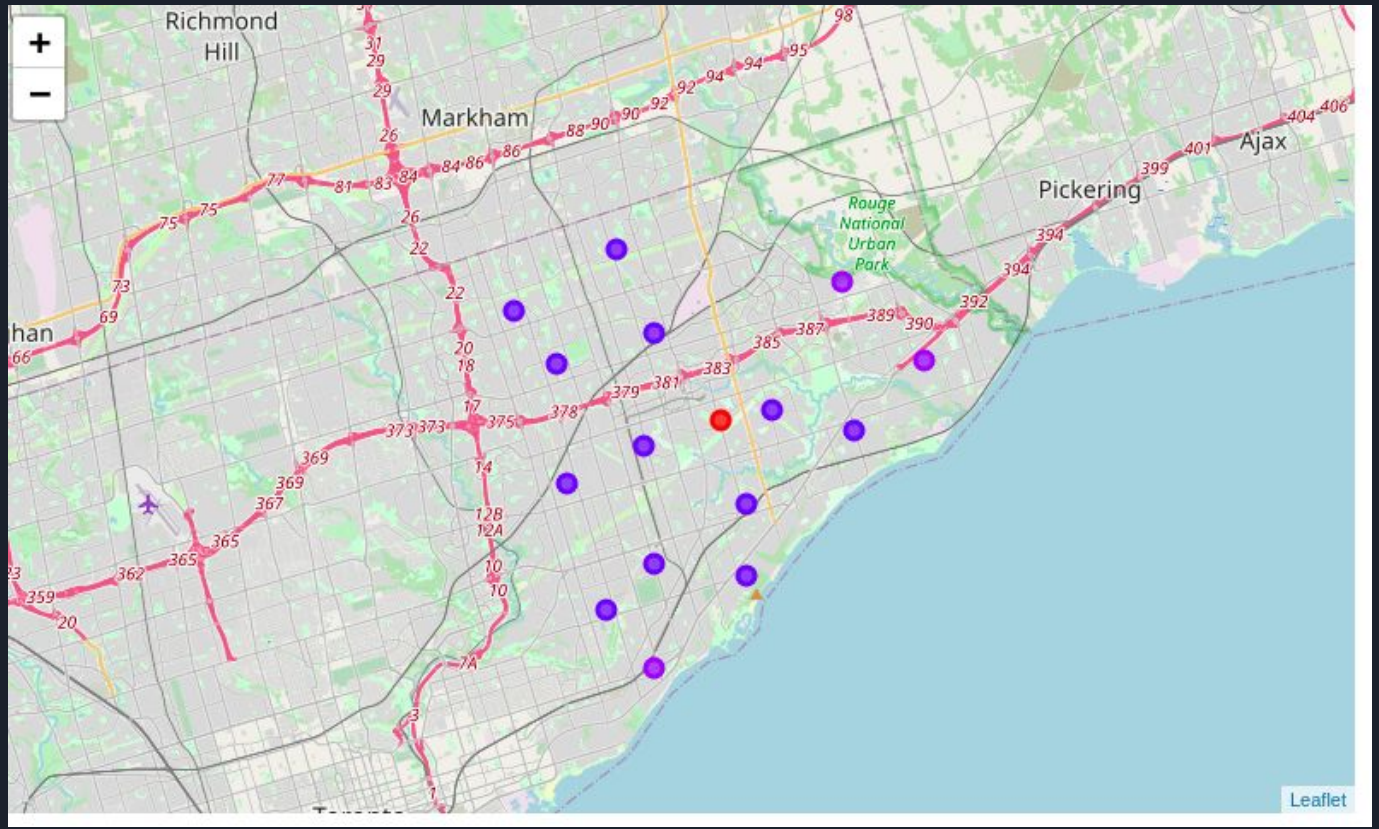
| | Neighborhood | 1st Most Common Venue | 2nd Most Common Venue | 3rd Most Common Venue | 4th Most Common Venue | 5th Most Common Venue | 6th Most Common Venue | 7th Most Common Venue | 8th Most Common Venue | 9th Most Common Venue | 10th Most Common Venue |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | Agincourt | Chinese Restaurant | Shopping Mall | Pool | Latin American Restaurant | Supermarket | Sushi Restaurant | Motorcycle Shop | Breakfast Spot | Sandwich Place | Print Shop |
| 1 | Alderwood / Long Branch | Convenience Store | Pizza Place | Gas Station | Pub | Pharmacy | Skating Rink | Coffee Shop | Sandwich Place | Athletics & Sports | Gym |
| 2 | Bathurst Manor / Wilson Heights / Downsview North | Bank | Coffee Shop | Bridal Shop | Trail | Shopping Mall | Middle Eastern Restaurant | Sandwich Place | Fried Chicken Joint | Supermarket | Sushi Restaurant |
| 3 | Bayview Village | Park | Construction & Landscaping | Trail | Farm | Dumpling Restaurant | Eastern European Restaurant | Electronics Store | Elementary School | Ethiopian Restaurant | Falafel Restaurant |
| 4 | Bedford Park / Lawrence Manor East | Restaurant | Coffee Shop | Sandwich Place | Italian Restaurant | Intersection | Greek Restaurant | Liquor Store | Sports Club | Juice Bar | Boutique |

# Clustering

```
[ ] # Using K-Means to cluster neighborhood into 3 clusters
    Scarborough_grouped_clustering = Scarborough_grouped.drop('Neighborhood', 1)
    kmeans = KMeans(n_clusters=3, random_state=0).fit(Scarborough_grouped_clustering)
    neighborhoods_venues_sorted.insert(0, 'Cluster Labels', kmeans.labels_)

    Scarborough_merged =df_2.iloc[:16,:]

    # merge toronto_grouped with toronto_data to add latitude/longitude for each neighborhood
    Scarborough_merged = Scarborough_merged.join(neighborhoods_venues_sorted.set_index('Neighborhood'), on='Neighborhood')

    Scarborough_merged.head()
```

| | 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 | Malvern / Rouge | 43.808626 | -79.189913 | 1 | Park | Trail | Women's Store | Farm | Dumpling Restaurant | Eastern European Restaurant | Electronics Store | Elementary School | Ethiopian Restaurant | Falafel Restaurant |
| 1 | M1C | Scarborough | Rouge Hill / Port Union / Highland Creek | 43.785779 | -79.157368 | 1 | Bar | Park | Women's Store | Dumpling Restaurant | Eastern European Restaurant | Electronics Store | Elementary School | Ethiopian Restaurant | Falafel Restaurant | Farm |
| 2 | M1E | Scarborough | Guildwood / Morningside / West Hill | 43.765806 | -79.185284 | 2 | Pizza Place | Fast Food Restaurant | Bank | Park | Coffee Shop | Medical Center | Supermarket | Laundromat | Fried Chicken Joint | Sports Bar |
| 3 | M1G | Scarborough | Woburn | 43.771545 | -79.218135 | 2 | Coffee Shop | Park | Business Service | Women's Store | Farmers Market | Eastern European Restaurant | Electronics Store | Elementary School | Ethiopian Restaurant | Falafel Restaurant |
| 4 | M1H | Scarborough | Cedarbrae | 43.768791 | -79.238813 | 0 | Thai Restaurant | Athletics & Sports | Bank | Hakka Restaurant | Gas Station | Fish Market | Fish & Chips Shop | Dumpling Restaurant | Food | Eastern European Restaurant |

# Result (selected neighbourhoods)



# THANK YOU