

CAPSTONE PROJECT



The Battle of Neighborhoods for finding a better place in Scarborough, Toronto

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INTRODUCTION

 Our purpose to help people in exploring better facilities, making smart and efficient decision on selecting best neighborhood in Scarborough, Toronto

 Aim to create an analysis of features for a people migrating to Scarborough to search a best neighborhood as a comparative analysis between neighborhoods

Also 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.

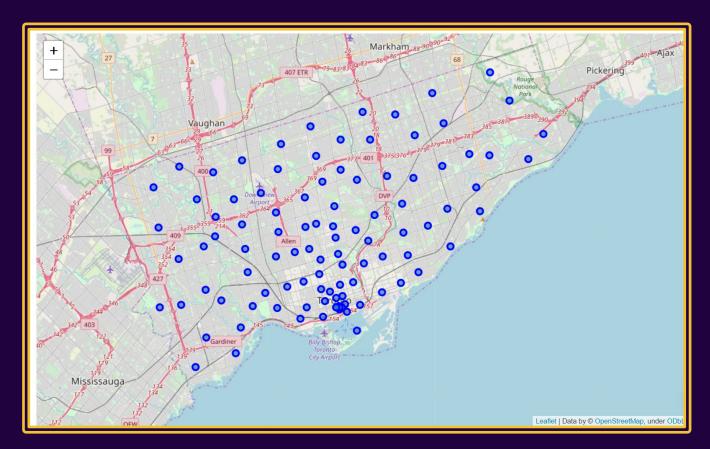
DATA

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

 Use Scarborough dataset which we scraped from wikipedia which consists of latitude, longitude and pincodes

- Use FourSquare API which gives information about the venue i.e.
 - a) Neighborhood
 - b) Neighborhood Latitude
 - c) Neighborhood Longitude
 - d) Venue
 - e) Name of the venue e.g. the name of a store or restaurant
 - f) Venue Latitude
 - g) Venue Longitude
 - h) Venue Category

Map of Scarborough



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 Venue using K-Means 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()# check the last columns!
[36]:
                                                             1st Most
                                                                       2nd Most
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                                                                                             Construction
                                                                                                              Fish &
                                                                 Zoo
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      orough
                             43.811525 -79.195517
                                                                         or Legal
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                   Highland
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                                                                          Falafel
                                                                                      Donut
                                                                                                Dumpling
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                                                                                                                                                            Event
                                                                                                                                                                        Yoga
               Creek, Rouge
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              Hill. Port Union
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                                                                                                   Fried
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                Morningside.
                             43.765815 -79.175193
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                                                                         Fitness
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      orough
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                                                                                                                                 Restaurant
                   West Hill
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                                                               Coffee
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      orough
                    Woburn 43.768369 -79.217590
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                                                                      Athletics &
                                                                                       Thai
                                                                                                                                                Indian
      orough
                  Cedarbrae 43.769688 -79.239440
                                                                                                   Bank
                                                                                                                                                         European
                                                                          Sports
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                                                                                                                                                                       Store
                                                                                                                                                        Restaurant
```

Most Common Venues near Neighborhood using Clustering

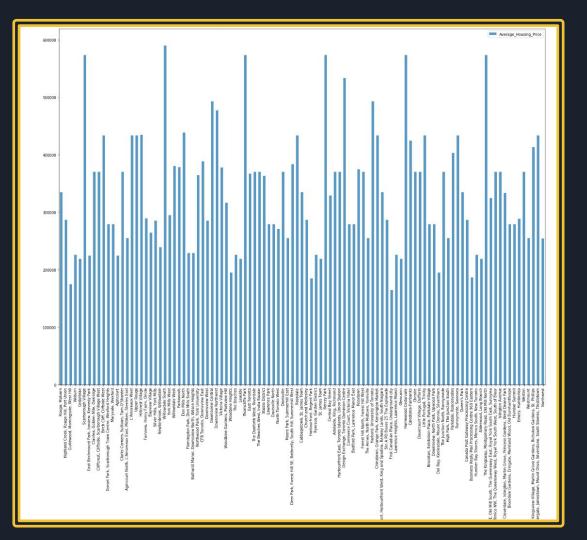
```
import numpy as np
      num top venues = 10
     indicators = ['st', 'nd', 'rd']
      columns = ['Neighborhood']
      for ind in np.arange(num top venues):
               columns.append('{}{} Most Common Venue'.format(ind+1, indicators[ind]))
          except:
               columns.append('{}th Most Common Venue'.format(ind+1))
      neighborhoods_venues_sorted = pd.DataFrame(columns=columns)
      neighborhoods venues sorted['Neighborhood'] = Scarborough grouped['Neighborhood']
      for ind in np.arange(Scarborough_grouped.shape[0]):
          neighborhoods venues sorted.iloc[ind, 1:] = return most common venues(Scarborough grouped.iloc[ind, :], num top venues)
      neighborhoods_venues_sorted.head()
ut[34]:
                                         1st Most
                                                      2nd Most
                                                                   3rd Most
                                                                                4th Most
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                                                                                                             Asian
                                                                                                                                                  American
               Adelaide, King, Richmond
                                       Coffee Shop
                                                          Café
                                                                               Gastropub
                                                                                           Burger Joint
                                                                                                                                    Restaurant
                                                                                                                                                             Steakhouse
                                                                                                         Restaurant
                                                                                                                                                 Restaurant
                                          Chinese
                                                      Shopping
                                                                                                Sushi
                                                                                                          Breakfast
                                                                 Pizza Place
                                                                             Supermarket
                                                                                                                       Print Shop
                                                                                                                                                Coffee Shop
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                             Agincourt
                                        Restaurant
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                       Agincourt North
                                                                                                                         Eastern
                                                      Sandwich
                                                                      Sushi
                                                                                                          Dumpling
                                                                                                                                    Electronics
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                                                                                                                                                               Ethiopian
              L'Amoreaux East, Milliken
                                         Pharmacv
                                                                                           Donut Shop
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                                                                                                                       Restaurant
                       Albion Gardens
                                          Grocery
                                                                   Sandwich
                                                                                Discount
                                                                                                              Fried
                                                                                                                                     Hardware
                                                                                                                                                               Fast Food
                                                                                             Japanese
                    Beaumond Heights.
                                                           Park
                                                                                                                       Beer Store
                                                                                                                                                Pizza Place
                                                                                                                                         Store
                                                                                                                                                              Restaurant
                                             Store
                                                                      Place
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                                                                                            Restaurant
                                                                                                      Chicken Joint
                       Humbergate, ...
                                      Convenience
                                                                   Sandwich
                                                                                                                                                                 Falafel
                                                                                                                                                Pizza Place
                Alderwood, Long Branch
                                                                              Coffee Shop
                                                                                           Gas Station Dance Studio
                                                                                                                           Gym
                                                                                                                                     Pharmacy
                                                                                                                                                              Restaurant
```

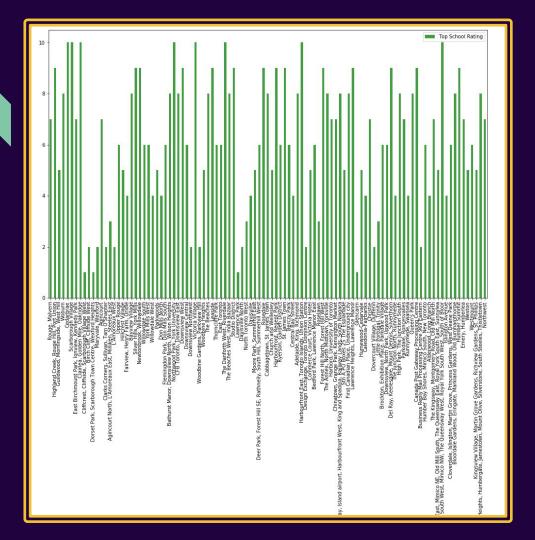
RESULTS

Map of Clusters in Scarborough, Toronto



Average Housing Price by Clusters in Scarborough





School Ratings by Clusters in Scarborough

DISCUSSION

Solved the below stated problem-

The major purpose 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.

CONCLUSION

 Using k-means cluster algorithm, separated the neighborhood into 10 different clusters and for 103 different latitude and longitude 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

Thank You

