

# Week 3 - Evaluating Toronto Neighborhoods

Gary Netherton - July 4, 2020

Initial download of Toronto data from Wikipedia

Use Pandas to scrape the web page and create a panda dataframe

```
In [2]: # import required libraries
import pandas as pd
pd.set_option('display.max_columns', None)
pd.set_option('display.max_rows', None)

import numpy as np
```

```
In [3]: # Use Pandas to scrape HTML table from Wikipedia; create a dataframe from results
data = pd.read_html('http://en.wikipedia.org/wiki/List_of_postal_codes_of_Canada:')
df = data[0]
print(df.shape)
df.head()
```

(180, 3)

Out[3]:

	Postal Code	Borough	Neighborhood
0	M1A	Not assigned	Not assigned
1	M2A	Not assigned	Not assigned
2	M3A	North York	Parkwoods
3	M4A	North York	Victoria Village
4	M5A	Downtown Toronto	Regent Park, Harbourfront

```
In [4]: # Remove rows where the Borough has not been assigned
df=df[df['Borough']!='Not assigned']
df.shape
```

Out[4]: (103, 3)

For next portion, collect the latitude and longitude of each Postal Code

Combine this data with the data from the initial data frame to form one dataframe with all information

```
In [5]: # Need to find Latitude and Longitude of each neighborhood
# Per the instructions, the geocoder package is unreliable. I was unable to make
# Using the provided CSV file to create a dataframe of postal codes with latitude
geodata = pd.read_csv(r'C:\Users\garyn\OneDrive\Documents\Coursera_Labs\Week_3_1a
geodata.head()
```

Out[5]:

	Postal Code	Latitude	Longitude
0	M1B	43.806686	-79.194353
1	M1C	43.784535	-79.160497
2	M1E	43.763573	-79.188711
3	M1G	43.770992	-79.216917
4	M1H	43.773136	-79.239476

```
In [6]: # Using merge to combine original dataframe with Latitude and Longitude dataframe
df = pd.merge(df, geodata, on='Postal Code', how='outer')
df.head()
```

Out[6]:

	Postal Code	Borough	Neighborhood	Latitude	Longitude
0	M3A	North York	Parkwoods	43.753259	-79.329656
1	M4A	North York	Victoria Village	43.725882	-79.315572
2	M5A	Downtown Toronto	Regent Park, Harbourfront	43.654260	-79.360636
3	M6A	North York	Lawrence Manor, Lawrence Heights	43.718518	-79.464763
4	M7A	Downtown Toronto	Queen's Park, Ontario Provincial Government	43.662301	-79.389494

**Download the appropriate libraries to use the Foursquare API to explore**

**Use Venues similar to the New York lab earlier in the course**

```
In [26]: import json # library to handle JSON files

        #!conda install -c conda-forge geopy --yes
        from geopy.geocoders import Nominatim # convert an address into Latitude and Longitude

        import requests # library to handle requests
        from pandas.io.json import json_normalize # tranform JSON file into a pandas dataframe

        # Matplotlib and associated plotting modules
        import matplotlib.cm as cm
        import matplotlib.colors as colors

        # import k-means from clustering stage
        from sklearn.cluster import KMeans

        #!conda install -c conda-forge folium=0.5.0 --yes
        import folium # map rendering library

        print('Libraries imported.')
```

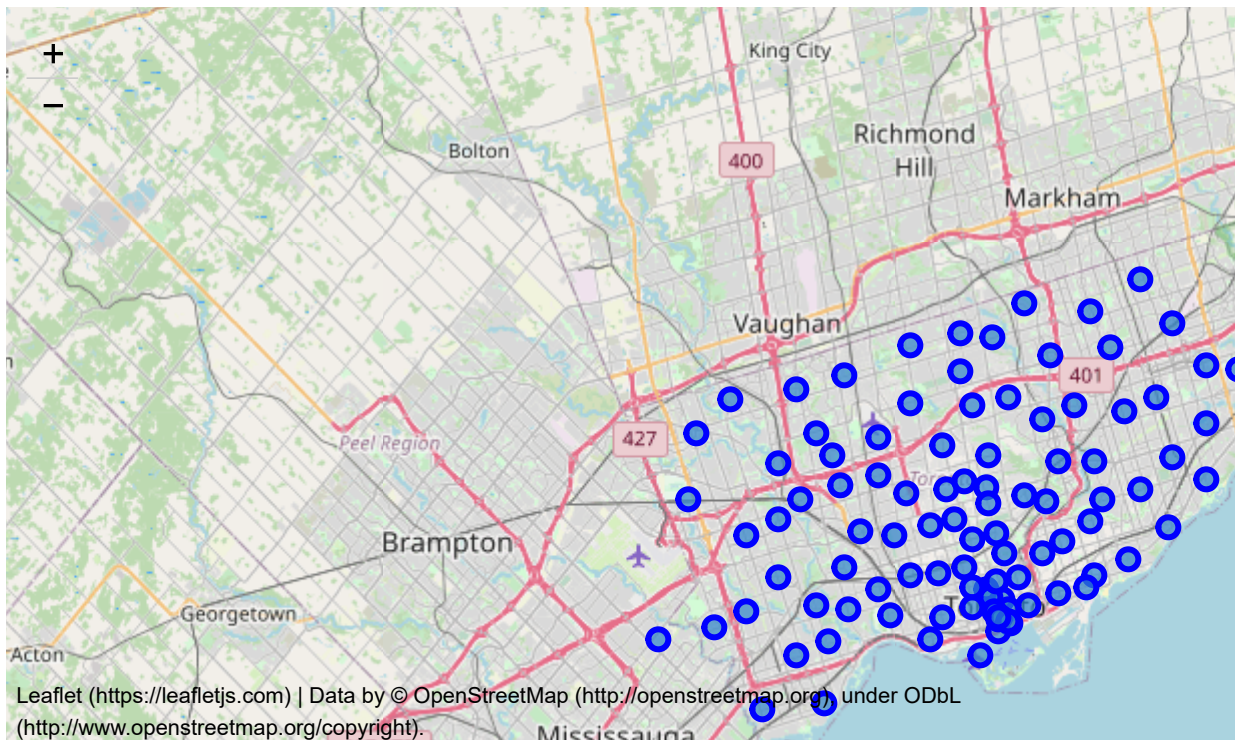
Libraries imported.

```
In [8]: # create map of Toronto using latitude and longitude values
map_toronto = folium.Map(location=[43.657952, -79.387383], zoom_start=10)

# add markers to map
for lat, lng, borough, neighborhood in zip(df['Latitude'], df['Longitude'], df['Borough'], df['Neighborhood']):
    label = '{} , {}'.format(neighborhood, borough)
    popup = folium.Popup(label, parse_html=True)
    folium.CircleMarker(
        [lat, lng],
        radius=5,
        popup=popup,
        color='blue',
        fill=True,
        fill_color='#3186cc',
        fill_opacity=0.7,
        parse_html=False).add_to(map_toronto)

map_toronto
```

Out[8]:



```
In [9]: # Setup the Foursquare API information

CLIENT_ID = 'BRBDGCKR00L1JCYN5RD3ZDJ2BNOJ5YOVAN3F2KZNVVUVB3VW' # your Foursquare
CLIENT_SECRET = '5N1FQNDDEEVF0LSK4A1SFM41P4KFSGECE1T23QNK20K1SD4PR' # your Foursquare
VERSION = '20180605' # Foursquare API version

print('Your credentials:')
print('CLIENT_ID: ' + CLIENT_ID)
print('CLIENT_SECRET: ' + CLIENT_SECRET)
```

Your credentials:

CLIENT\_ID: BRBDGCKR00L1JCYN5RD3ZDJ2BNOJ5YOVAN3F2KZNVVUVB3VW

CLIENT\_SECRET: 5N1FQNDDEEVF0LSK4A1SFM41P4KFSGECE1T23QNK20K1SD4PR

```
In [10]: LIMIT = 100 # Limit of number of venues returned by Foursquare API
radius = 500 # define radius
```

```
In [11]: # Create function to collect venue information from all neighborhoods in Toronto
def getNearbyVenues(names, latitudes, longitudes, radius=500):

    venues_list=[]
    for name, lat, lng in zip(names, latitudes, longitudes):
        print(name)

        # create the API request URL
        url = 'https://api.foursquare.com/v2/venues/explore?&client_id={}&client_
            CLIENT_ID,
            CLIENT_SECRET,
            VERSION,
            lat,
            lng,
            radius,
            LIMIT)

        # make the GET request
        results = requests.get(url).json()["response"]["groups"][0]["items"]

        # return only relevant information for each nearby venue
        venues_list.append([(
            name,
            lat,
            lng,
            v['venue']['name'],
            v['venue']['location']['lat'],
            v['venue']['location']['lng'],
            v['venue']['categories'][0]['name']) for v in results])

    nearby_venues = pd.DataFrame([item for venue_list in venues_list for item in
    nearby_venues.columns = ['Neighborhood',
        'Neighborhood Latitude',
        'Neighborhood Longitude',
        'Venue',
        'Venue Latitude',
        'Venue Longitude',
        'Venue Category']

    return(nearby_venues)
```

```
In [12]: # Collect the information from Foursquare for Toronto neighborhoods
toronto_venues = getNearbyVenues(df['Neighborhood'],
                                   df['Latitude'],
                                   df['Longitude']
                                   )
```

Parkwoods  
 Victoria Village  
 Regent Park, Harbourfront  
 Lawrence Manor, Lawrence Heights  
 Queen's Park, Ontario Provincial Government  
 Islington Avenue, Humber Valley Village  
 Malvern, Rouge  
 Don Mills  
 Parkview Hill, Woodbine Gardens  
 Garden District, Ryerson  
 Glencairn  
 West Deane Park, Princess Gardens, Martin Grove, Islington, Cloverdale  
 Rouge Hill, Port Union, Highland Creek  
 Don Mills  
 Woodbine Heights  
 St. James Town  
 Humewood-Cedarvale  
 Eringate, Bloordale Gardens, Old Burnhamthorpe, Markland Wood  
 Guildwood, Morningside, West Hill  
 The Beaches  
 Berczy Park  
 Caledonia-Fairbanks  
 Woburn  
 Leaside  
 Central Bay Street  
 Christie  
 Cedarbrae  
 Hillcrest Village  
 Bathurst Manor, Wilson Heights, Downsview North  
 Thorncliffe Park  
 Richmond, Adelaide, King  
 Dufferin, Dovercourt Village  
 Scarborough Village  
 Fairview, Henry Farm, Oriole  
 Northwood Park, York University  
 East Toronto, Broadview North (Old East York)  
 Harbourfront East, Union Station, Toronto Islands  
 Little Portugal, Trinity  
 Kennedy Park, Ionview, East Birchmount Park  
 Bayview Village  
 Downsview  
 The Danforth West, Riverdale  
 Toronto Dominion Centre, Design Exchange  
 Brockton, Parkdale Village, Exhibition Place  
 Golden Mile, Clairlea, Oakridge  
 York Mills, Silver Hills  
 Downsview  
 India Bazaar, The Beaches West  
 Commerce Court, Victoria Hotel  
 North Park, Maple Leaf Park, Upwood Park  
 Humber Summit

Cliffside, Cliffcrest, Scarborough Village West  
Willowdale, Newtonbrook  
Downsview  
Studio District  
Bedford Park, Lawrence Manor East  
Del Ray, Mount Dennis, Keelsdale and Silverthorn  
Humberlea, Emery  
Birch Cliff, Cliffside West  
Willowdale, Willowdale East  
Downsview  
Lawrence Park  
Roselawn  
Runnymede, The Junction North  
Weston  
Dorset Park, Wexford Heights, Scarborough Town Centre  
York Mills West  
Davisville North  
Forest Hill North & West, Forest Hill Road Park  
High Park, The Junction South  
Westmount  
Wexford, Maryvale  
Willowdale, Willowdale West  
North Toronto West, Lawrence Park  
The Annex, North Midtown, Yorkville  
Parkdale, Roncesvalles  
Canada Post Gateway Processing Centre  
Kingsview Village, St. Phillips, Martin Grove Gardens, Richview Gardens  
Agincourt  
Davisville  
University of Toronto, Harbord  
Runnymede, Swansea  
Clarks Corners, Tam O'Shanter, Sullivan  
Moore Park, Summerhill East  
Kensington Market, Chinatown, Grange Park  
Milliken, Agincourt North, Steeles East, L'Amoreaux East  
Summerhill West, Rathnelly, South Hill, Forest Hill SE, Deer Park  
CN Tower, King and Spadina, Railway Lands, Harbourfront West, Bathurst Quay, South Niagara, Island airport  
New Toronto, Mimico South, Humber Bay Shores  
South Steeles, Silverstone, Humbergate, Jamestown, Mount Olive, Beaumont Heights, Thistletown, Albion Gardens  
Steeles West, L'Amoreaux West  
Rosedale  
Stn A PO Boxes  
Alderwood, Long Branch  
Northwest, West Humber - Clairville  
Upper Rouge  
St. James Town, Cabbagetown  
First Canadian Place, Underground city  
The Kingsway, Montgomery Road, Old Mill North  
Church and Wellesley  
Business reply mail Processing Centre, South Central Letter Processing Plant Toronto  
Old Mill South, King's Mill Park, Sunnylea, Humber Bay, Mimico NE, The Queensway East, Royal York South East, Kingsway Park South East  
Mimico NW, The Queensway West, South of Bloor, Kingsway Park South West, Royal York South West

## Explore the venue information that downloaded from Foursquare

```
In [13]: # Get shape and head() of dataframe
print(toronto_venues.shape)
toronto_venues.head()
```

(2129, 7)

Out[13]:

	Neighborhood	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
0	Parkwoods	43.753259	-79.329656	Brookbanks Park	43.751976	-79.332140	Park
1	Parkwoods	43.753259	-79.329656	Variety Store	43.751974	-79.333114	Food & Drink Shop
2	Victoria Village	43.725882	-79.315572	Victoria Village Arena	43.723481	-79.315635	Hockey Arena
3	Victoria Village	43.725882	-79.315572	Portugril	43.725819	-79.312785	Portuguese Restaurant
4	Victoria Village	43.725882	-79.315572	Tim Hortons	43.725517	-79.313103	Coffee Shop

```
In [14]: # Number of venues returned for each neighborhood
toronto_venues.groupby('Neighborhood').count()
```

Out[14]:

	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
Neighborhood						
Agincourt	5	5	5	5	5	5
Alderwood, Long Branch	8	8	8	8	8	8
Bathurst Manor, Wilson Heights, Downsview North	20	20	20	20	20	20
Bayview Village	4	4	4	4	4	4
Bedford Park, Lawrence Manor East	24	24	24	24	24	24
Berczy Park	58	58	58	58	58	58
Birch Cliff, Cliffside West	4	4	4	4	4	4
Brockton, Parkdale Village, Exhibition Place	22	22	22	22	22	22

## Summarize unique categories from returned venues

```
In [15]: print('There are {} uniques categories.'.format(len(toronto_venues['Venue Category'])))
There are 268 uniques categories.
```



## Analyze Each Neighborhood in Toronto

```
In [16]: # one hot encoding
toronto_onehot = pd.get_dummies(toronto_venues[['Venue Category']], prefix="", pr

# add neighborhood column back to dataframe
toronto_onehot['Neighborhood'] = toronto_venues['Neighborhood']

# move neighborhood column to the first column
fixed_columns = [toronto_onehot.columns[-1]] + list(toronto_onehot.columns[:-1])
toronto_onehot = toronto_onehot[fixed_columns]
print(toronto_onehot.shape)
toronto_onehot.head()
```

(2129, 268)

Out[16]:

	Yoga Studio	Accessories Store	Afghan Restaurant	Airport	Airport Food Court	Airport Lounge	Airport Service	Airport Terminal	American Restaurant	Antiqu Shc
0	0	0	0	0	0	0	0	0	0	
1	0	0	0	0	0	0	0	0	0	
2	0	0	0	0	0	0	0	0	0	
3	0	0	0	0	0	0	0	0	0	
4	0	0	0	0	0	0	0	0	0	

**Similar to the New Yort lab, group rows by neighborhood by taking the mean**

**of the frequency of occurrence of each category**

```
In [17]: toronto_grouped = toronto_onehot.groupby('Neighborhood').mean().reset_index()
print(toronto_grouped.shape)
toronto_grouped.head()
```

(93, 268)

Out[17]:

	Neighborhood	Yoga Studio	Accessories Store	Afghan Restaurant	Airport	Airport Food Court	Airport Lounge	Airport Service	Airport Terminal	A
0	Agincourt	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	(
1	Alderwood, Long Branch	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	(
2	Bathurst Manor, Wilson Heights, Downsview North	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	(
3	Bayview Village	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	(
4	Bedford Park, Lawrence Manor East	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	(

**Print each neighborhood with top 5 most common venues**

**Then, add that to a pandas dataframe**

```
In [18]: num_top_venues = 5

for hood in toronto_grouped['Neighborhood']:
    print("-----"+hood+"-----")
    temp = toronto_grouped[toronto_grouped['Neighborhood'] == hood].T.reset_index()
    temp.columns = ['venue', 'freq']
    temp = temp.iloc[1:]
    temp['freq'] = temp['freq'].astype(float)
    temp = temp.round({'freq': 2})
    print(temp.sort_values('freq', ascending=False).reset_index(drop=True).head(r
    print('\n')
```

----Agincourt----

	venue	freq
0	Clothing Store	0.2
1	Breakfast Spot	0.2
2	Lounge	0.2
3	Latin American Restaurant	0.2
4	Skating Rink	0.2

----Alderwood, Long Branch----

	venue	freq
0	Pizza Place	0.25
1	Sandwich Place	0.12
2	Gym	0.12
3	Pool	0.12
4	Dance Studio	0.12

----Bathurst Manor, Wilson Heights, Downsview North----

```
In [19]: # Insert the most common venues data into a pandas dataframe
def return_most_common_venues(row, num_top_venues):
    row_categories = row.iloc[1:]
    row_categories_sorted = row_categories.sort_values(ascending=False)

    return row_categories_sorted.index.values[0:num_top_venues]
```

```

In [20]: # The following code creates a new dataframe that will display the top 10 venues
num_top_venues = 10

indicators = ['st', 'nd', 'rd']

# create columns according to number of top venues
columns = ['Neighborhood']
for ind in np.arange(num_top_venues):
    try:
        columns.append('{}{} Most Common Venue'.format(ind+1, indicators[ind]))
    except:
        columns.append('{}th Most Common Venue'.format(ind+1))

# create a new dataframe
neighborhoods_venues_sorted = pd.DataFrame(columns=columns)
neighborhoods_venues_sorted['Neighborhood'] = toronto_grouped['Neighborhood']

for ind in np.arange(toronto_grouped.shape[0]):
    neighborhoods_venues_sorted.iloc[ind, 1:] = return_most_common_venues(toronto_grouped, ind+1, num_top_venues)

neighborhoods_venues_sorted.head()

```

Out[20]:

	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
0	Agincourt	Lounge	Latin American Restaurant	Breakfast Spot	Skating Rink	Clothing Store	Drugstore	Discount Store	Di
1	Alderwood, Long Branch	Pizza Place	Dance Studio	Pub	Gym	Coffee Shop	Sandwich Place	Pool	
2	Bathurst Manor, Wilson Heights, Downsview North	Coffee Shop	Bank	Frozen Yogurt Shop	Shopping Mall	Bridal Shop	Sandwich Place	Diner	Re
3	Bayview Village	Café	Bank	Chinese Restaurant	Japanese Restaurant	Women's Store	Discount Store	Distribution Center	
4	Bedford Park, Lawrence Manor East	Coffee Shop	Restaurant	Sandwich Place	Italian Restaurant	Thai Restaurant	Pharmacy	Pizza Place	

**Now to cluster the neighborhoods into 5 clusters**

**Picking the number 5 semi-randomly ("semi-randomly" as it was used in the New York lab)**

```
In [21]: # set number of clusters
kclusters = 5

toronto_grouped_clustering = toronto_grouped.drop('Neighborhood', 1)

# run k-means clustering
kmeans = KMeans(n_clusters=kclusters, random_state=0).fit(toronto_grouped_clustering)

# check cluster labels generated for each row in the dataframe
kmeans.labels_[0:10]
```

Out[21]: array([2, 2, 2, 2, 2, 2, 2, 2, 2, 2])

```
In [28]: # add clustering labels for new dataframe to include the cluster and its top 10 venues
neighborhoods_venues_sorted.insert(0, df[list("ABCD")] = df[list("ABCD")].fillna(0))

toronto_merged = df

# merge toronto_grouped with toronto_data to add Latitude/Longitude for each neighborhood
toronto_merged = toronto_merged.join(neighborhoods_venues_sorted.set_index('Neighborhood'))

toronto_merged.head()
```

Out[28]:

	Postal Code	Borough	Neighborhood	Latitude	Longitude	Cluster Labels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue
0	M3A	North York	Parkwoods	43.753259	-79.329656	1.0	Food & Drink Shop	Park	Womans Store
1	M4A	North York	Victoria Village	43.725882	-79.315572	2.0	Portuguese Restaurant	Coffee Shop	French Restaurant
2	M5A	Downtown Toronto	Regent Park, Harbourfront	43.654260	-79.360636	2.0	Coffee Shop	Park	
3	M6A	North York	Lawrence Manor, Lawrence Heights	43.718518	-79.464763	2.0	Clothing Store	Accessories Store	Furniture Home Store
4	M7A	Downtown Toronto	Queen's Park, Ontario Provincial Government	43.662301	-79.389494	2.0	Coffee Shop	Diner	Sandwich Restaurant

## Visualize the clusters

```
In [35]: # Administrative information needed to map

toronto_merged['Cluster Labels'] = toronto_merged['Cluster Labels'].fillna(0.0).a

address = 'Toronto, CA'

geolocator = Nominatim(user_agent="CA_explorer")
location = geolocator.geocode(address)
latitude = location.latitude
longitude = location.longitude
print('The geograpical coordinate of Toronto are {}, {}'.format(latitude, longit

The geograpical coordinate of Toronto are 43.6534817, -79.3839347.
```

```

In [36]: # create map
import folium

map_clusters = folium.Map(location=[latitude, longitude], zoom_start=11)

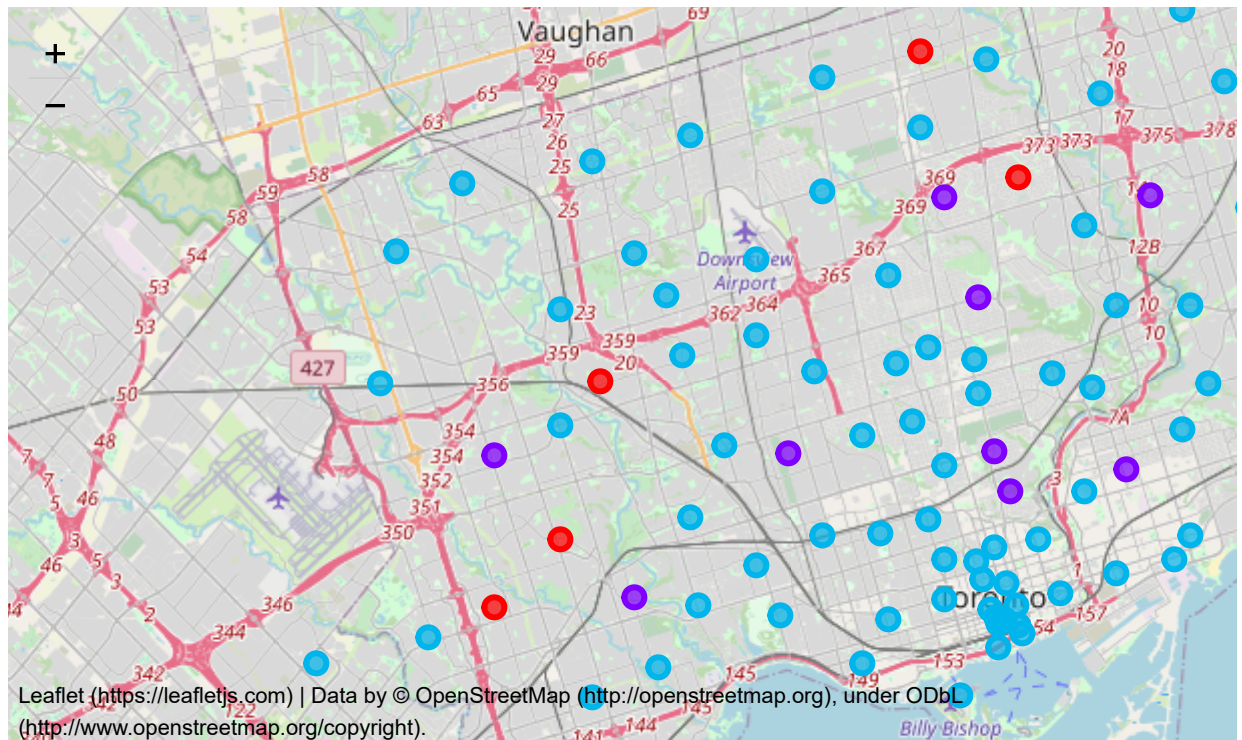
# set color scheme for the clusters
x = np.arange(kclusters)
ys = [i + x + (i*x)**2 for i in range(kclusters)]
colors_array = cm.rainbow(np.linspace(0, 1, len(ys)))
rainbow = [colors.rgb2hex(i) for i in colors_array]

# add markers to the map
markers_colors = []
for lat, lon, poi, cluster in zip(toronto_merged['Latitude'], toronto_merged['Longitude'],
    label = folium.Popup(str(poi) + ' Cluster ' + str(cluster), parse_html=True)
    folium.CircleMarker(
        [lat, lon],
        radius=5,
        popup=label,
        color=rainbow[cluster-1],
        fill=True,
        fill_color=rainbow[cluster-1],
        fill_opacity=0.7).add_to(map_clusters)

map_clusters

```

Out[36]:



**Finally, examine the clusters**

```
In [37]: # CLUSTER #1
toronto_merged.loc[toronto_merged['Cluster Labels'] == 0, toronto_merged.columns]
```

Out[37]:

	Borough	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
5	Etobicoke	0	NaN	NaN	NaN	NaN	NaN	NaN	
11	Etobicoke	0	NaN	NaN	NaN	NaN	NaN	NaN	
32	Scarborough	0	Playground	Women's Store	Donut Shop	Dim Sum Restaurant	Diner	Discount Store	Distribution Center
45	North York	0	NaN	NaN	NaN	NaN	NaN	NaN	
52	North York	0	NaN	NaN	NaN	NaN	NaN	NaN	
64	York	0	NaN	NaN	NaN	NaN	NaN	NaN	
85	Scarborough	0	Park	Playground	Sculpture Garden	Dog Run	Dessert Shop	Dim Sum Restaurant	
95	Scarborough	0	NaN	NaN	NaN	NaN	NaN	NaN	

```
In [38]: # CLUSTER #2
toronto_merged.loc[toronto_merged['Cluster Labels'] == 1, toronto_merged.columns]
```

Out[38]:

	Borough	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
0	North York	1	Food & Drink Shop	Park	Women's Store	Diner	Discount Store	Distribution Center	
21	York	1	Park	Pool	Women's Store	Greek Restaurant	Gourmet Shop	Ethiopian Restaurant	Electronics Store
35	East York	1	Park	Metro Station	Convenience Store	Women's Store	Doner Restaurant	Diner	
61	Central Toronto	1	Park	Bus Line	Swim School	Dog Run	Dim Sum Restaurant	Diner	
66	North York	1	Park	Convenience Store	Women's Store	Donut Shop	Diner	Discount Store	Distribution Center
77	Etobicoke	1	Park	Sandwich Place	Department Store	Event Space	Ethiopian Restaurant	Electronics Store	Electronics Store
83	Central Toronto	1	Park	Women's Store	Donut Shop	Dim Sum Restaurant	Diner	Discount Store	Distribution Center
91	Downtown Toronto	1	Park	Trail	Playground	Dim Sum Restaurant	Diner	Discount Store	Distribution Center
98	Etobicoke	1	Park	River	Smoke Shop	Dog Run	Dessert Shop	Dim Sum Restaurant	



```
In [39]: # CLUSTER #3
toronto_merged.loc[toronto_merged['Cluster Labels'] == 2, toronto_merged.columns]
```

Out[39]:

	Borough	Cluster Labels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue
1	North York	2	Portuguese Restaurant	Coffee Shop	French Restaurant	Hockey Arena	Intersection
2	Downtown Toronto	2	Coffee Shop	Park	Pub	Bakery	Theater
3	North York	2	Clothing Store	Accessories Store	Furniture / Home Store	Boutique	Vietnamese Restaurant
4	Downtown Toronto	2	Coffee Shop	Diner	Sushi Restaurant	Yoga Studio	College Auditorium
7	North York	2	Gym	Asian Restaurant	Beer Store	Japanese Restaurant	Coffee Shop
8	East York	2	Pizza Place	Gym / Fitness Center	Gastropub	Fast Food Restaurant	Intersection

```
In [40]: # CLUSTER #4
toronto_merged.loc[toronto_merged['Cluster Labels'] == 3, toronto_merged.columns]
```

Out[40]:

	Borough	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
12	Scarborough	3	Bar	Women's Store	Donut Shop	Diner	Discount Store	Distribution Center	Dog Run

```
In [41]: # CLUSTER #5
toronto_merged.loc[toronto_merged['Cluster Labels'] == 4, toronto_merged.columns]
```

Out[41]:

	Borough	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
6	Scarborough	4	Fast Food Restaurant	Dessert Shop	Farmers Market	Falafel Restaurant	Event Space	Ethiopian Restaurant	Electronics Store

In [ ]:

