Neighborhood Evaluator

```
  In this project, we will be using Foursquare's data l
ocation set to help locate a suitable neighborhood to m
ove to that is:
      1. closer to a newly accepted job
      2. is very similar to our current neighborhood
      3. determine how popular it is
```

In [29]:

```
# Notebook is used for the IBM Data Science capstone project

import pandas as pd
import numpy as np
print('Imported')
```

```
Imported
```

In [30]:

```
print('Hello Capstone Project Course!')
```

```
Hello Capstone Project Course!
```

In [31]:

```
# Cells 25-26 are to answer the question: "Use pandas, or the BeautifulSoup

df = pd.read_csv("Toronto.csv")
print(df.head())
```

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

In [32]:

```
# All lines with the Borough and/or Neighborhood listed as "Not Assigned" we

df.shape
```

Out[32]:

```
(103, 3)
```

In [33]:

```
pip install geocoder
```

```
Requirement already satisfied: geocoder in /home/jupyterlab/conda/envs/pytho
Requirement already satisfied: click in /home/jupyterlab/conda/envs/python/l
Requirement already satisfied: six in /home/jupyterlab/conda/envs/python/lib
Requirement already satisfied: requests in /home/jupyterlab/conda/envs/pytho
Requirement already satisfied: ratelim in /home/jupyterlab/conda/envs/python
Requirement already satisfied: future in /home/jupyterlab/conda/envs/python/
Requirement already satisfied: certifi>=2017.4.17 in /home/jupyterlab/conda/
Requirement already satisfied: chardet<4,>=3.0.2 in /home/jupyterlab/conda/e
Requirement already satisfied: urllib3!=1.25.0,!=1.25.1,<1.26,>=1.21.1 in /h
Requirement already satisfied: idna<3,>=2.5 in /home/jupyterlab/conda/envs/p
Requirement already satisfied: decorator in /home/jupyterlab/conda/envs/pyth
Note: you may need to restart the kernel to use updated packages.
```

In [34]:

```
import geocoder # import geocoder
print('Imported')
```

```
Imported
```

In [35]:

```
# imports Toronto data with coordinates assigned to answer "Use the Geocoder

TorontoCoordinates = pd.read_csv("TorontoCoordinates.csv")
print(TorontoCoordinates.head())
```

```
  Postal Code      Borough                              Neighborhood   Latit
0         M1B  Scarborough                            Malvern, Rouge  43.806
1         M1C  Scarborough  Rouge Hill, Port Union, Highland Creek  43.784
2         M1E  Scarborough       Guildwood, Morningside, West Hill  43.763
3         M1G  Scarborough                                    Woburn  43.770
4         M1H  Scarborough                                 Cedarbrae  43.773

   Longitude
0 -79.194353
1 -79.160497
2 -79.188711
3 -79.216917
4 -79.239476
```

In [36]:

```
print('The dataframe has {} boroughs.'.format(
        len(TorontoCoordinates['Borough'].unique()))
     )
```

```
The dataframe has 10 boroughs.
```

In [37]:

```
# Create new table with only the Boroughs witin Toronto only

TorontoBoroughs = TorontoCoordinates[TorontoCoordinates['Borough'].str.conta
print(TorontoBoroughs.head())
```

```
   Postal Code          Borough                      Neighborhood   Latitude
37         M4E     East Toronto                       The Beaches  43.676357
41         M4K     East Toronto   The Danforth West, Riverdale  43.679557
42         M4L     East Toronto  India Bazaar, The Beaches West  43.668999
43         M4M     East Toronto                   Studio District  43.659526
44         M4N  Central Toronto                     Lawrence Park  43.728020

    Longitude
37 -79.293031
41 -79.352188
42 -79.315572
43 -79.340923
44 -79.388790
```

In [38]:

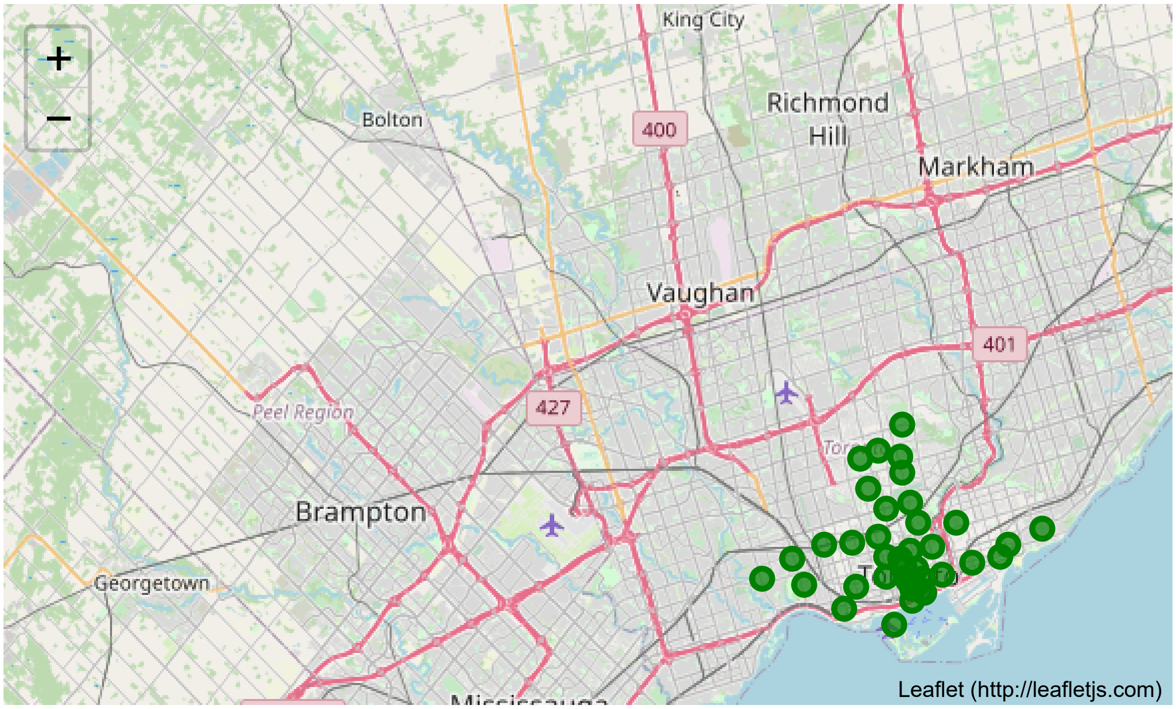
```
# import plotting library

import folium
from IPython.core.display import HTML
m = folium.Map(location=[45.5236, -122.6750])
HTML(m._repr_html_())

from sklearn.cluster import KMeans
import matplotlib.cm as cm
import matplotlib.colors as colors

print('Folium installed')
```

```
Folium installed
```

In [39]:

```
# Create a map of Toronto using the Boroughs within Toronto, excluding those

map_toronto = folium.Map(location=[43.651070,-79.347015],zoom_start=10)

for lat,lng,Borough,Neighborhood in zip(TorontoBoroughs['Latitude'],TorontoB
    label = '{}, {}'.format(Neighborhood, Borough)
    label = folium.Popup(label, parse_html=True)
    folium.CircleMarker(
    [lat,lng],
    radius=5,
    popup=label,
    color='green',
    fill=True,
    fill_color='green',
    fill_opacity=0.7,
    parse_html=False).add_to(map_toronto)
map_toronto
```

Out[39]:



In [40]:

```
k=5
toronto_kdf = TorontoBoroughs.drop(['Postal Code','Borough','Neighborhood'],
kmeans = KMeans(n_clusters = k,random_state=0).fit(toronto_kdf)
kmeans.labels_
TorontoBoroughs.insert(0, 'Cluster Labels', kmeans.labels_)
```

In [41]:

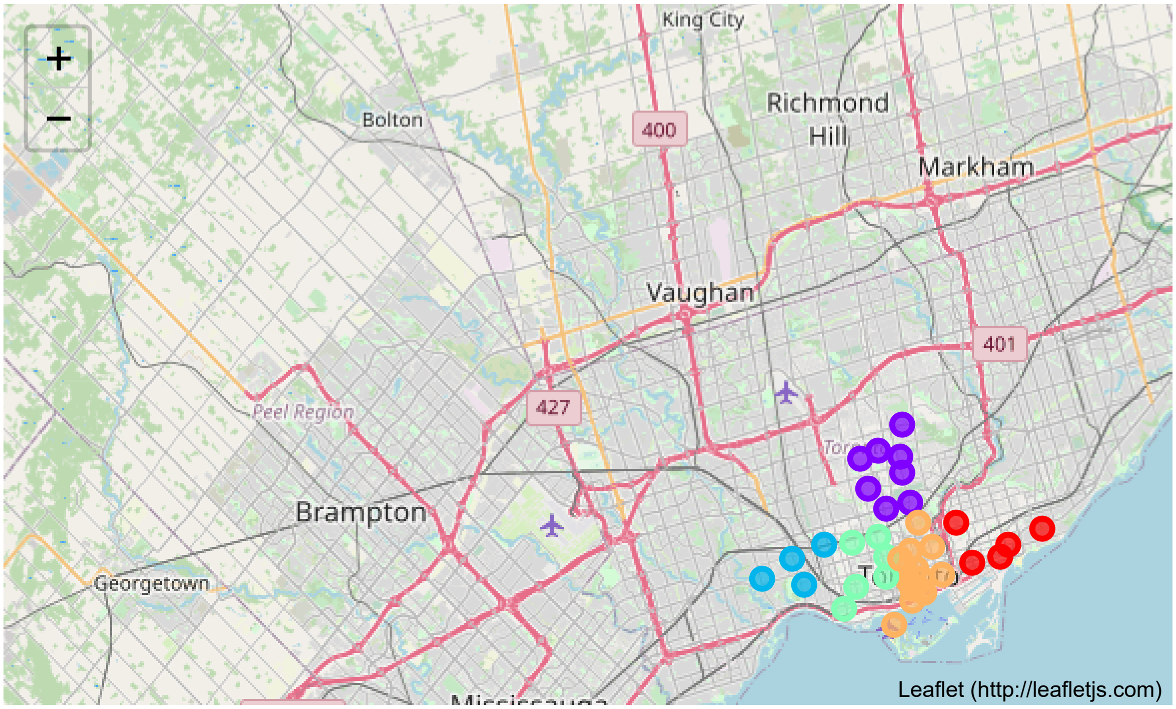
```
print(TorontoBoroughs.head())
```

```
    Cluster Labels Postal Code          Borough  \
37               0         M4E     East Toronto   
41               0         M4K     East Toronto   
42               0         M4L     East Toronto   
43               0         M4M     East Toronto   
44               1         M4N  Central Toronto   

                      Neighborhood   Latitude  Longitude  
37                     The Beaches  43.676357 -79.293031  
41    The Danforth West, Riverdale  43.679557 -79.352188  
42  India Bazaar, The Beaches West  43.668999 -79.315572  
43                 Studio District  43.659526 -79.340923  
44                   Lawrence Park  43.728020 -79.388790  
```

In [42]:

```
# Create the cluster map

toronto_cluster_map = folium.Map(location=[43.651070,-79.347015],zoom_start=

# set color scheme for the clusters

x = np.arange(k)
ys = [i + x + (i*x)**2 for i in range(k)]
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, neighbourhood, cluster in zip(TorontoBoroughs['Latitude'], Tor
    label = folium.Popup(' 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(toronto_cluster_map)
toronto_cluster_map
```

Out[42]:



In [ ]: