Cluster Toronto Neighbourhood

Read Tabel from URL

```
In [59]:  import pandas as pd
          tables = pd.read_html('https://en.wikipedia.org/wiki/List_of_postal_codes_of_Canada:_M')
```

In [60]:
```python
dataframe = tables[0]
dataframe.columns = dataframe.iloc[0]
dataframe = dataframe.iloc[1:]
dataframe.head
```

```
Out[60]: <bound method NDFrame.head of 0    Postal Code              Borough  \
         1           M1A        Not assigned
         2           M2A        Not assigned
         3           M3A          North York
         4           M4A          North York
         5           M5A     Downtown Toronto
         6           M6A          North York
         7           M7A     Downtown Toronto
         8           M8A        Not assigned
         9           M9A           Etobicoke
         10          M1B          Scarborough
         11          M2B        Not assigned
         12          M3B          North York
         13          M4B            East York
         14          M5B     Downtown Toronto
         15          M6B          North York
         16          M7B        Not assigned
         17          M8B        Not assigned
         18          M9B           Etobicoke
         19          M1C          Scarborough
         20          M2C        Not assigned
         21          M3C          North York
         22          M4C            East York
         23          M5C     Downtown Toronto
         24          M6C                 York
         25          M7C        Not assigned
         26          M8C        Not assigned
         27          M9C           Etobicoke
         28          M1E          Scarborough
         29          M2E        Not assigned
         30          M3E        Not assigned
         ..          ...                  ...
         151         M7W        Not assigned
         152         M8W           Etobicoke
         153         M9W           Etobicoke
         154         M1X          Scarborough
         155         M2X        Not assigned
         156         M3X        Not assigned
         157         M4X     Downtown Toronto
         158         M5X     Downtown Toronto
         159         M6X        Not assigned
         160         M7X        Not assigned
         161         M8X           Etobicoke
```

```
162      M9X       Not assigned
163      M1Y       Not assigned
164      M2Y       Not assigned
165      M3Y       Not assigned
166      M4Y    Downtown Toronto
167      M5Y       Not assigned
168      M6Y       Not assigned
169      M7Y       East Toronto
170      M8Y           Etobicoke
171      M9Y       Not assigned
172      M1Z       Not assigned
173      M2Z       Not assigned
174      M3Z       Not assigned
175      M4Z       Not assigned
176      M5Z       Not assigned
177      M6Z       Not assigned
178      M7Z       Not assigned
179      M8Z           Etobicoke
180      M9Z       Not assigned


0                                         Neighbourhood
1                                          Not assigned
2                                          Not assigned
3                                             Parkwoods
4                                       Victoria Village
5                             Regent Park, Harbourfront
6                       Lawrence Manor, Lawrence Heights
7         Queen's Park, Ontario Provincial Government
8                                          Not assigned
9             Islington Avenue, Humber Valley Village
10                                         Malvern, Rouge
11                                         Not assigned
12                                             Don Mills
13                       Parkview Hill, Woodbine Gardens
14                             Garden District, Ryerson
15                                             Glencairn
16                                         Not assigned
17                                         Not assigned
18      West Deane Park, Princess Gardens, Martin Grov...
19                   Rouge Hill, Port Union, Highland Creek
20                                         Not assigned
21                                             Don Mills
22                                     Woodbine Heights
```

```
23                                      St. James Town
24                                  Humewood-Cedarvale
25                                        Not assigned
26                                        Not assigned
27    Eringate, Bloordale Gardens, Old Burnhamthorpe...
28                      Guildwood, Morningside, West Hill
29                                        Not assigned
30                                        Not assigned
..                                                 ...
151                                       Not assigned
152                              Alderwood, Long Branch
153                      Northwest, West Humber - Clairville
154                                        Upper Rouge
155                                       Not assigned
156                                       Not assigned
157                         St. James Town, Cabbagetown
158                  First Canadian Place, Underground city
159                                       Not assigned
160                                       Not assigned
161      The Kingsway, Montgomery Road, Old Mill North
162                                       Not assigned
163                                       Not assigned
164                                       Not assigned
165                                       Not assigned
166                                 Church and Wellesley
167                                       Not assigned
168                                       Not assigned
169    Business reply mail Processing Centre, South C...
170    Old Mill South, King's Mill Park, Sunnylea, Hu...
171                                       Not assigned
172                                       Not assigned
173                                       Not assigned
174                                       Not assigned
175                                       Not assigned
176                                       Not assigned
177                                       Not assigned
178                                       Not assigned
179    Mimico NW, The Queensway West, South of Bloor,...
180                                       Not assigned

[180 rows x 3 columns]>
```

ignore not assighted cells in Borough

In [61]:
```python
dataframe = dataframe[dataframe.Borough != 'Not assigned']
dataframe.head
```

```
Out[61]: <bound method NDFrame.head of 0   Postal Code            Borough  \
         3            M3A          North York
         4            M4A          North York
         5            M5A    Downtown Toronto
         6            M6A          North York
         7            M7A    Downtown Toronto
         9            M9A           Etobicoke
         10           M1B         Scarborough
         12           M3B          North York
         13           M4B           East York
         14           M5B    Downtown Toronto
         15           M6B          North York
         18           M9B           Etobicoke
         19           M1C         Scarborough
         21           M3C          North York
         22           M4C           East York
         23           M5C    Downtown Toronto
         24           M6C                York
         27           M9C           Etobicoke
         28           M1E         Scarborough
         31           M4E        East Toronto
         32           M5E    Downtown Toronto
         33           M6E                York
         37           M1G         Scarborough
         40           M4G           East York
         41           M5G    Downtown Toronto
         42           M6G    Downtown Toronto
         46           M1H         Scarborough
         47           M2H          North York
         48           M3H          North York
         49           M4H           East York
         ..           ...                 ...
         112          M4R     Central Toronto
         113          M5R     Central Toronto
         114          M6R        West Toronto
         115          M7R         Mississauga
         117          M9R           Etobicoke
         118          M1S         Scarborough
         121          M4S     Central Toronto
         122          M5S    Downtown Toronto
         123          M6S        West Toronto
         127          M1T         Scarborough
         130          M4T     Central Toronto
```

```
131     M5T   Downtown Toronto
136     M1V         Scarborough
139     M4V    Central Toronto
140     M5V   Downtown Toronto
143     M8V           Etobicoke
144     M9V           Etobicoke
145     M1W         Scarborough
148     M4W   Downtown Toronto
149     M5W   Downtown Toronto
152     M8W           Etobicoke
153     M9W           Etobicoke
154     M1X         Scarborough
157     M4X   Downtown Toronto
158     M5X   Downtown Toronto
161     M8X           Etobicoke
166     M4Y   Downtown Toronto
169     M7Y        East Toronto
170     M8Y           Etobicoke
179     M8Z           Etobicoke
```

```
0                                          Neighbourhood
3                                              Parkwoods
4                                       Victoria Village
5                            Regent Park, Harbourfront
6                     Lawrence Manor, Lawrence Heights
7         Queen's Park, Ontario Provincial Government
9               Islington Avenue, Humber Valley Village
10                                         Malvern, Rouge
12                                              Don Mills
13                        Parkview Hill, Woodbine Gardens
14                               Garden District, Ryerson
15                                              Glencairn
18      West Deane Park, Princess Gardens, Martin Grov...
19                    Rouge Hill, Port Union, Highland Creek
21                                              Don Mills
22                                        Woodbine Heights
23                                         St. James Town
24                                      Humewood-Cedarvale
27      Eringate, Bloordale Gardens, Old Burnhamthorpe...
28                      Guildwood, Morningside, West Hill
31                                             The Beaches
32                                            Berczy Park
33                                      Caledonia-Fairbanks
```

```
37                                                    Woburn
40                                                   Leaside
41                                        Central Bay Street
42                                                  Christie
46                                                 Cedarbrae
47                                         Hillcrest Village
48       Bathurst Manor, Wilson Heights, Downsview North
49                                         Thorncliffe Park
..                                                       ...
112                         North Toronto West, Lawrence Park
113                         The Annex, North Midtown, Yorkville
114                                    Parkdale, Roncesvalles
115                     Canada Post Gateway Processing Centre
117   Kingsview Village, St. Phillips, Martin Grove ...
118                                                 Agincourt
121                                                Davisville
122                              University of Toronto, Harbord
123                                        Runnymede, Swansea
127              Clarks Corners, Tam O'Shanter, Sullivan
130                             Moore Park, Summerhill East
131              Kensington Market, Chinatown, Grange Park
136   Milliken, Agincourt North, Steeles East, L'Amo...
139   Summerhill West, Rathnelly, South Hill, Forest...
140   CN Tower, King and Spadina, Railway Lands, Har...
143          New Toronto, Mimico South, Humber Bay Shores
144   South Steeles, Silverstone, Humbergate, Jamest...
145                          Steeles West, L'Amoreaux West
148                                                  Rosedale
149                                         Stn A PO Boxes
152                                  Alderwood, Long Branch
153                       Northwest, West Humber - Clairville
154                                               Upper Rouge
157                         St. James Town, Cabbagetown
158                   First Canadian Place, Underground city
161          The Kingsway, Montgomery Road, Old Mill North
166                                     Church and Wellesley
169   Business reply mail Processing Centre, South C...
170   Old Mill South, King's Mill Park, Sunnylea, Hu...
179   Mimico NW, The Queensway West, South of Bloor,...

[103 rows x 3 columns]>
```

Same Postal codes combine into one row with the neighborhoods separated with a comma

In [62]:
```python
df=dataframe.groupby("Postal Code").agg(lambda x:','.join(set(x)))
df.head
```

```
Out[62]: <bound method NDFrame.head of 0                   Borough  \
         Postal Code
         M1B                Scarborough
         M1C                Scarborough
         M1E                Scarborough
         M1G                Scarborough
         M1H                Scarborough
         M1J                Scarborough
         M1K                Scarborough
         M1L                Scarborough
         M1M                Scarborough
         M1N                Scarborough
         M1P                Scarborough
         M1R                Scarborough
         M1S                Scarborough
         M1T                Scarborough
         M1V                Scarborough
         M1W                Scarborough
         M1X                Scarborough
         M2H                 North York
         M2J                 North York
         M2K                 North York
         M2L                 North York
         M2M                 North York
         M2N                 North York
         M2P                 North York
         M2R                 North York
         M3A                 North York
         M3B                 North York
         M3C                 North York
         M3H                 North York
         M3J                 North York
         ...                        ...
         M6C                       York
         M6E                       York
         M6G           Downtown Toronto
         M6H               West Toronto
         M6J               West Toronto
         M6K               West Toronto
         M6L                 North York
         M6M                       York
         M6N                       York
         M6P               West Toronto
```

```
M6R              West Toronto
M6S              West Toronto
M7A          Downtown Toronto
M7R               Mississauga
M7Y              East Toronto
M8V                Etobicoke
M8W                Etobicoke
M8X                Etobicoke
M8Y                Etobicoke
M8Z                Etobicoke
M9A                Etobicoke
M9B                Etobicoke
M9C                Etobicoke
M9L               North York
M9M               North York
M9N                     York
M9P                Etobicoke
M9R                Etobicoke
M9V                Etobicoke
M9W                Etobicoke
```

```
0                                            Neighbourhood
Postal Code
M1B                                          Malvern, Rouge
M1C              Rouge Hill, Port Union, Highland Creek
M1E                   Guildwood, Morningside, West Hill
M1G                                                  Woburn
M1H                                               Cedarbrae
M1J                                     Scarborough Village
M1K          Kennedy Park, Ionview, East Birchmount Park
M1L                          Golden Mile, Clairlea, Oakridge
M1M      Cliffside, Cliffcrest, Scarborough Village West
M1N                             Birch Cliff, Cliffside West
M1P      Dorset Park, Wexford Heights, Scarborough Town...
M1R                                        Wexford, Maryvale
M1S                                                Agincourt
M1T              Clarks Corners, Tam O'Shanter, Sullivan
M1V      Milliken, Agincourt North, Steeles East, L'Amo...
M1W                          Steeles West, L'Amoreaux West
M1X                                             Upper Rouge
M2H                                       Hillcrest Village
M2J                          Fairview, Henry Farm, Oriole
M2K                                         Bayview Village
```

```
M2L                              York Mills, Silver Hills
M2M                              Willowdale, Newtonbrook
M2N                          Willowdale, Willowdale East
M2P                                         York Mills West
M2R                          Willowdale, Willowdale West
M3A                                               Parkwoods
M3B                                               Don Mills
M3C                                               Don Mills
M3H         Bathurst Manor, Wilson Heights, Downsview North
M3J                          Northwood Park, York University
...                                                      ...
M6C                                       Humewood-Cedarvale
M6E                                      Caledonia-Fairbanks
M6G                                                 Christie
M6H                          Dufferin, Dovercourt Village
M6J                                 Little Portugal, Trinity
M6K             Brockton, Parkdale Village, Exhibition Place
M6L             North Park, Maple Leaf Park, Upwood Park
M6M      Del Ray, Mount Dennis, Keelsdale and Silverthorn
M6N                          Runnymede, The Junction North
M6P                          High Park, The Junction South
M6R                                 Parkdale, Roncesvalles
M6S                                      Runnymede, Swansea
M7A             Queen's Park, Ontario Provincial Government
M7R                     Canada Post Gateway Processing Centre
M7Y         Business reply mail Processing Centre, South C...
M8V             New Toronto, Mimico South, Humber Bay Shores
M8W                                 Alderwood, Long Branch
M8X         The Kingsway, Montgomery Road, Old Mill North
M8Y         Old Mill South, King's Mill Park, Sunnylea, Hu...
M8Z         Mimico NW, The Queensway West, South of Bloor,...
M9A             Islington Avenue, Humber Valley Village
M9B         West Deane Park, Princess Gardens, Martin Grov...
M9C         Eringate, Bloordale Gardens, Old Burnhamthorpe...
M9L                                         Humber Summit
M9M                                       Humberlea, Emery
M9N                                                  Weston
M9P                                               Westmount
M9R         Kingsview Village, St. Phillips, Martin Grove ...
M9V         South Steeles, Silverstone, Humbergate, Jamest...
M9W             Northwest, West Humber - Clairville

[103 rows x 2 columns]>
```

If a cell has a borough but a Not assigned neighborhood, then the neighborhood will be the same as the borough.

In [63]:
```
df.loc[df['Neighbourhood']=="Not assigned",'Neighbourhood']=df.loc[df['Neighbourhood']=="Not assigned",'Borough']
df.head
```

```
Out[63]: <bound method NDFrame.head of 0                           Borough  \
         Postal Code
         M1B                 Scarborough
         M1C                 Scarborough
         M1E                 Scarborough
         M1G                 Scarborough
         M1H                 Scarborough
         M1J                 Scarborough
         M1K                 Scarborough
         M1L                 Scarborough
         M1M                 Scarborough
         M1N                 Scarborough
         M1P                 Scarborough
         M1R                 Scarborough
         M1S                 Scarborough
         M1T                 Scarborough
         M1V                 Scarborough
         M1W                 Scarborough
         M1X                 Scarborough
         M2H                 North York
         M2J                 North York
         M2K                 North York
         M2L                 North York
         M2M                 North York
         M2N                 North York
         M2P                 North York
         M2R                 North York
         M3A                 North York
         M3B                 North York
         M3C                 North York
         M3H                 North York
         M3J                 North York
         ...                        ...
         M6C                       York
         M6E                       York
         M6G           Downtown Toronto
         M6H               West Toronto
         M6J               West Toronto
         M6K               West Toronto
         M6L                 North York
         M6M                       York
         M6N                       York
         M6P               West Toronto
```

```
M6R              West Toronto
M6S              West Toronto
M7A          Downtown Toronto
M7R              Mississauga
M7Y              East Toronto
M8V                Etobicoke
M8W                Etobicoke
M8X                Etobicoke
M8Y                Etobicoke
M8Z                Etobicoke
M9A                Etobicoke
M9B                Etobicoke
M9C                Etobicoke
M9L              North York
M9M              North York
M9N                     York
M9P                Etobicoke
M9R                Etobicoke
M9V                Etobicoke
M9W                Etobicoke


0                                                Neighbourhood
Postal Code
M1B                                              Malvern, Rouge
M1C                Rouge Hill, Port Union, Highland Creek
M1E                    Guildwood, Morningside, West Hill
M1G                                                      Woburn
M1H                                                    Cedarbrae
M1J                                         Scarborough Village
M1K                Kennedy Park, Ionview, East Birchmount Park
M1L                         Golden Mile, Clairlea, Oakridge
M1M          Cliffside, Cliffcrest, Scarborough Village West
M1N                             Birch Cliff, Cliffside West
M1P       Dorset Park, Wexford Heights, Scarborough Town...
M1R                                          Wexford, Maryvale
M1S                                                  Agincourt
M1T                Clarks Corners, Tam O'Shanter, Sullivan
M1V       Milliken, Agincourt North, Steeles East, L'Amo...
M1W                          Steeles West, L'Amoreaux West
M1X                                                Upper Rouge
M2H                                          Hillcrest Village
M2J                         Fairview, Henry Farm, Oriole
M2K                                            Bayview Village
```

```
M2L                          York Mills, Silver Hills
M2M                          Willowdale, Newtonbrook
M2N                          Willowdale, Willowdale East
M2P                                          York Mills West
M2R                          Willowdale, Willowdale West
M3A                                                Parkwoods
M3B                                                Don Mills
M3C                                                Don Mills
M3H        Bathurst Manor, Wilson Heights, Downsview North
M3J                          Northwood Park, York University
...                                                      ...
M6C                                         Humewood-Cedarvale
M6E                                         Caledonia-Fairbanks
M6G                                                   Christie
M6H                          Dufferin, Dovercourt Village
M6J                                  Little Portugal, Trinity
M6K              Brockton, Parkdale Village, Exhibition Place
M6L                  North Park, Maple Leaf Park, Upwood Park
M6M        Del Ray, Mount Dennis, Keelsdale and Silverthorn
M6N                          Runnymede, The Junction North
M6P                          High Park, The Junction South
M6R                                  Parkdale, Roncesvalles
M6S                                  Runnymede, Swansea
M7A              Queen's Park, Ontario Provincial Government
M7R                  Canada Post Gateway Processing Centre
M7Y        Business reply mail Processing Centre, South C...
M8V              New Toronto, Mimico South, Humber Bay Shores
M8W                                  Alderwood, Long Branch
M8X          The Kingsway, Montgomery Road, Old Mill North
M8Y        Old Mill South, King's Mill Park, Sunnylea, Hu...
M8Z        Mimico NW, The Queensway West, South of Bloor,...
M9A                  Islington Avenue, Humber Valley Village
M9B        West Deane Park, Princess Gardens, Martin Grov...
M9C        Eringate, Bloordale Gardens, Old Burnhamthorpe...
M9L                                          Humber Summit
M9M                                          Humberlea, Emery
M9N                                                   Weston
M9P                                                Westmount
M9R          Kingsview Village, St. Phillips, Martin Grove ...
M9V          South Steeles, Silverstone, Humbergate, Jamest...
M9W                  Northwest, West Humber - Clairville

[103 rows x 2 columns]>
```

In [64]: `df.shape`

Out[64]: (103, 2)

In [65]:
```python
geo_dataframe=pd.read_csv('https://cocl.us/Geospatial_data')
geo_dataframe.head
```

```
Out[65]: <bound method NDFrame.head of      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
         5              M1J   43.744734  -79.239476
         6              M1K   43.727929  -79.262029
         7              M1L   43.711112  -79.284577
         8              M1M   43.716316  -79.239476
         9              M1N   43.692657  -79.264848
         10             M1P   43.757410  -79.273304
         11             M1R   43.750072  -79.295849
         12             M1S   43.794200  -79.262029
         13             M1T   43.781638  -79.304302
         14             M1V   43.815252  -79.284577
         15             M1W   43.799525  -79.318389
         16             M1X   43.836125  -79.205636
         17             M2H   43.803762  -79.363452
         18             M2J   43.778517  -79.346556
         19             M2K   43.786947  -79.385975
         20             M2L   43.757490  -79.374714
         21             M2M   43.789053  -79.408493
         22             M2N   43.770120  -79.408493
         23             M2P   43.752758  -79.400049
         24             M2R   43.782736  -79.442259
         25             M3A   43.753259  -79.329656
         26             M3B   43.745906  -79.352188
         27             M3C   43.725900  -79.340923
         28             M3H   43.754328  -79.442259
         29             M3J   43.767980  -79.487262
         ..             ...         ...         ...
         73             M6C   43.693781  -79.428191
         74             M6E   43.689026  -79.453512
         75             M6G   43.669542  -79.422564
         76             M6H   43.669005  -79.442259
         77             M6J   43.647927  -79.419750
         78             M6K   43.636847  -79.428191
         79             M6L   43.713756  -79.490074
         80             M6M   43.691116  -79.476013
         81             M6N   43.673185  -79.487262
         82             M6P   43.661608  -79.464763
         83             M6R   43.648960  -79.456325
```

```
84              M6S   43.651571 -79.484450
85              M7A   43.662301 -79.389494
86              M7R   43.636966 -79.615819
87              M7Y   43.662744 -79.321558
88              M8V   43.605647 -79.501321
89              M8W   43.602414 -79.543484
90              M8X   43.653654 -79.506944
91              M8Y   43.636258 -79.498509
92              M8Z   43.628841 -79.520999
93              M9A   43.667856 -79.532242
94              M9B   43.650943 -79.554724
95              M9C   43.643515 -79.577201
96              M9L   43.756303 -79.565963
97              M9M   43.724766 -79.532242
98              M9N   43.706876 -79.518188
99              M9P   43.696319 -79.532242
100             M9R   43.688905 -79.554724
101             M9V   43.739416 -79.588437
102             M9W   43.706748 -79.594054

[103 rows x 3 columns]>
```

In [66]:
```python
df['Latitude']=geo_dataframe['Latitude'].values
df['Longitude']=geo_dataframe['Longitude'].values
```

In [67]: `df.head`

```
Out[67]: <bound method NDFrame.head of 0                          Borough  \
         Postal Code
         M1B                 Scarborough
         M1C                 Scarborough
         M1E                 Scarborough
         M1G                 Scarborough
         M1H                 Scarborough
         M1J                 Scarborough
         M1K                 Scarborough
         M1L                 Scarborough
         M1M                 Scarborough
         M1N                 Scarborough
         M1P                 Scarborough
         M1R                 Scarborough
         M1S                 Scarborough
         M1T                 Scarborough
         M1V                 Scarborough
         M1W                 Scarborough
         M1X                 Scarborough
         M2H                  North York
         M2J                  North York
         M2K                  North York
         M2L                  North York
         M2M                  North York
         M2N                  North York
         M2P                  North York
         M2R                  North York
         M3A                  North York
         M3B                  North York
         M3C                  North York
         M3H                  North York
         M3J                  North York
         ...                         ...
         M6C                        York
         M6E                        York
         M6G            Downtown Toronto
         M6H                West Toronto
         M6J                West Toronto
         M6K                West Toronto
         M6L                  North York
         M6M                        York
         M6N                        York
         M6P                West Toronto
```

```
        M6R              West Toronto
        M6S              West Toronto
        M7A          Downtown Toronto
        M7R              Mississauga
        M7Y              East Toronto
        M8V                Etobicoke
        M8W                Etobicoke
        M8X                Etobicoke
        M8Y                Etobicoke
        M8Z                Etobicoke
        M9A                Etobicoke
        M9B                Etobicoke
        M9C                Etobicoke
        M9L               North York
        M9M               North York
        M9N                     York
        M9P                Etobicoke
        M9R                Etobicoke
        M9V                Etobicoke
        M9W                Etobicoke


        0                                         Neighbourhood   Latitude  \
        Postal Code
        M1B                                       Malvern, Rouge  43.806686
        M1C             Rouge Hill, Port Union, Highland Creek  43.784535
        M1E                  Guildwood, Morningside, West Hill  43.763573
        M1G                                               Woburn  43.770992
        M1H                                            Cedarbrae  43.773136
        M1J                                 Scarborough Village  43.744734
        M1K           Kennedy Park, Ionview, East Birchmount Park  43.727929
        M1L                       Golden Mile, Clairlea, Oakridge  43.711112
        M1M        Cliffside, Cliffcrest, Scarborough Village West  43.716316
        M1N                        Birch Cliff, Cliffside West  43.692657
        M1P        Dorset Park, Wexford Heights, Scarborough Town...  43.757410
        M1R                                    Wexford, Maryvale  43.750072
        M1S                                            Agincourt  43.794200
        M1T              Clarks Corners, Tam O'Shanter, Sullivan  43.781638
        M1V        Milliken, Agincourt North, Steeles East, L'Amo...  43.815252
        M1W                         Steeles West, L'Amoreaux West  43.799525
        M1X                                          Upper Rouge  43.836125
        M2H                                    Hillcrest Village  43.803762
        M2J                        Fairview, Henry Farm, Oriole  43.778517
        M2K                                      Bayview Village  43.786947
```

M2L	York Mills, Silver Hills	43.757490
M2M	Willowdale, Newtonbrook	43.789053
M2N	Willowdale, Willowdale East	43.770120
M2P	York Mills West	43.752758
M2R	Willowdale, Willowdale West	43.782736
M3A	Parkwoods	43.753259
M3B	Don Mills	43.745906
M3C	Don Mills	43.725900
M3H	Bathurst Manor, Wilson Heights, Downsview North	43.754328
M3J	Northwood Park, York University	43.767980
...	...	...
M6C	Humewood-Cedarvale	43.693781
M6E	Caledonia-Fairbanks	43.689026
M6G	Christie	43.669542
M6H	Dufferin, Dovercourt Village	43.669005
M6J	Little Portugal, Trinity	43.647927
M6K	Brockton, Parkdale Village, Exhibition Place	43.636847
M6L	North Park, Maple Leaf Park, Upwood Park	43.713756
M6M	Del Ray, Mount Dennis, Keelsdale and Silverthorn	43.691116
M6N	Runnymede, The Junction North	43.673185
M6P	High Park, The Junction South	43.661608
M6R	Parkdale, Roncesvalles	43.648960
M6S	Runnymede, Swansea	43.651571
M7A	Queen's Park, Ontario Provincial Government	43.662301
M7R	Canada Post Gateway Processing Centre	43.636966
M7Y	Business reply mail Processing Centre, South C...	43.662744
M8V	New Toronto, Mimico South, Humber Bay Shores	43.605647
M8W	Alderwood, Long Branch	43.602414
M8X	The Kingsway, Montgomery Road, Old Mill North	43.653654
M8Y	Old Mill South, King's Mill Park, Sunnylea, Hu...	43.636258
M8Z	Mimico NW, The Queensway West, South of Bloor,...	43.628841
M9A	Islington Avenue, Humber Valley Village	43.667856
M9B	West Deane Park, Princess Gardens, Martin Grov...	43.650943
M9C	Eringate, Bloordale Gardens, Old Burnhamthorpe...	43.643515
M9L	Humber Summit	43.756303
M9M	Humberlea, Emery	43.724766
M9N	Weston	43.706876
M9P	Westmount	43.696319
M9R	Kingsview Village, St. Phillips, Martin Grove ...	43.688905
M9V	South Steeles, Silverstone, Humbergate, Jamest...	43.739416
M9W	Northwest, West Humber - Clairville	43.706748

0	Longitude

```
           Postal Code
M1B              -79.194353
M1C              -79.160497
M1E              -79.188711
M1G              -79.216917
M1H              -79.239476
M1J              -79.239476
M1K              -79.262029
M1L              -79.284577
M1M              -79.239476
M1N              -79.264848
M1P              -79.273304
M1R              -79.295849
M1S              -79.262029
M1T              -79.304302
M1V              -79.284577
M1W              -79.318389
M1X              -79.205636
M2H              -79.363452
M2J              -79.346556
M2K              -79.385975
M2L              -79.374714
M2M              -79.408493
M2N              -79.408493
M2P              -79.400049
M2R              -79.442259
M3A              -79.329656
M3B              -79.352188
M3C              -79.340923
M3H              -79.442259
M3J              -79.487262
...                      ...
M6C              -79.428191
M6E              -79.453512
M6G              -79.422564
M6H              -79.442259
M6J              -79.419750
M6K              -79.428191
M6L              -79.490074
M6M              -79.476013
M6N              -79.487262
M6P              -79.464763
M6R              -79.456325
```

```
M6S          -79.484450
M7A          -79.389494
M7R          -79.615819
M7Y          -79.321558
M8V          -79.501321
M8W          -79.543484
M8X          -79.506944
M8Y          -79.498509
M8Z          -79.520999
M9A          -79.532242
M9B          -79.554724
M9C          -79.577201
M9L          -79.565963
M9M          -79.532242
M9N          -79.518188
M9P          -79.532242
M9R          -79.554724
M9V          -79.588437
M9W          -79.594054

[103 rows x 4 columns]>
```
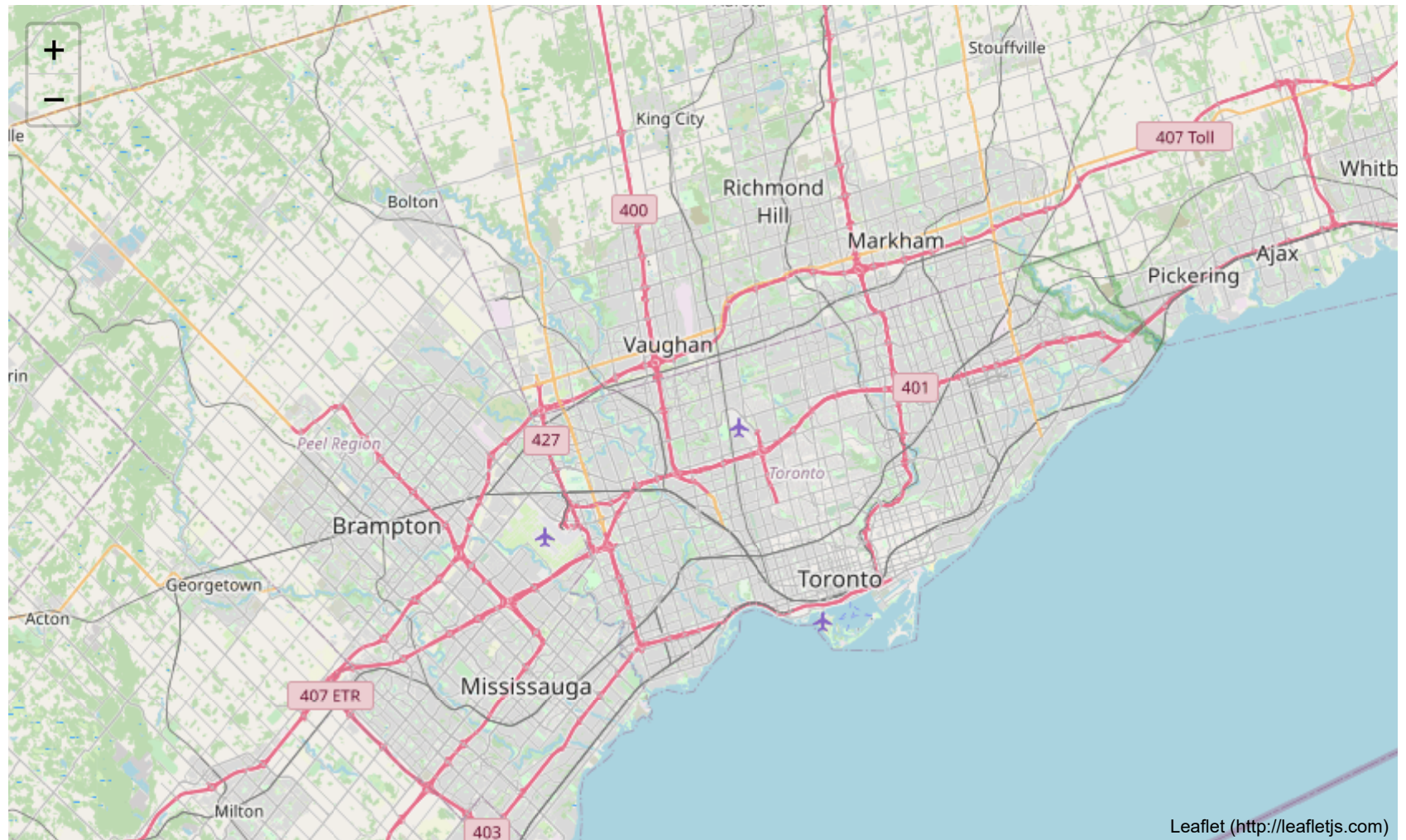
In [68]:
```python
import folium # map rendering library

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

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

In [69]:
```python
# create map of Toronto using latitude and longitude values
latitude = df['Latitude'].mean()
longitude = df['Longitude'].mean()
map_toronto = folium.Map(location=[latitude, longitude], zoom_start=10)
map_toronto
```

Out[69]:

In [70]:
```python
for lat, lng, borough, neighborhood in zip(
        df['Latitude'],
        df['Longitude'],
        df['Borough'],
        df['Neighbourhood']):
    label = '{}, {}'.format(neighborhood, borough)
    label = folium.Popup(label, parse_html=True)
    folium.CircleMarker(
        [lat, lng],
        radius=5,
        popup=label,
        color='blue',
        fill=True,
        fill_color='#3186cc',
        fill_opacity=0.7,
        parse_html=False).add_to(map_toronto)

map_toronto
```

Out[70]:

Leaflet (http://leafletjs.com)