

# Week 3: Segmenting and Clustering Neighborhoods in Toronto

In this assignment, you will be required to explore, segment, and cluster the neighborhoods in the city of Toronto. However, unlike New York, the neighborhood data is not readily available on the internet. What is interesting about the field of data science is that each project can be challenging in its unique way, so you need to learn to be agile and refine the skill to learn new libraries and tools quickly depending on the project.

For the Toronto neighborhood data, a Wikipedia page exists that has all the information we need to explore and cluster the neighborhoods in Toronto. You will be required to scrape the Wikipedia page and wrangle the data, clean it, and then read it into a pandas dataframe so that it is in a structured format like the New York dataset.

Once the data is in a structured format, you can replicate the analysis that we did to the New York City dataset to explore and cluster the neighborhoods in the city of Toronto.

## Section 1

Use the Notebook to build the code to scrape the following Wikipedia page, [https://en.wikipedia.org/wiki/List\\_of\\_postal\\_codes\\_of\\_Canada\\_M](https://en.wikipedia.org/wiki/List_of_postal_codes_of_Canada_M), in order to obtain the data that is in the table of postal codes and to transform the data into a pandas dataframe.

```
import libraries

In [1]:
import requests
import bs4
import lxml.html as lh
import pandas as pd
pd.set_option('display.max_rows',200)
import folium

In [2]:
res = requests.get("https://en.wikipedia.org/wiki/List_of_postal_codes_of_Canada_M")

In [3]:
#Store the contents of the website under doc
doc = lh.fromstring(res.content)

In [4]:
print(doc)

<Element html at 0x2afdb35ae0>

In [5]:
#Parse data that are stored between <tr>...</tr> of HTML
tr_elements = doc.xpath('//tr')

In [6]:
#Check the length of the first 12 rows
[len(t) for t in tr_elements[:12]]

Out[6]:
[3, 3, 3, 3, 3, 3, 3, 3, 3, 3, 3, 3]

In [7]:
#Parse Table Header
tr_elements = doc.xpath('//tr')

In [8]:
#Create empty list
col=[]
i=0

#For each row, store each first element (header) and an empty list
for t in tr_elements[0]:
    name=t.text.content()
    print('id:'+str(i)+' name:'+str(name))
    col.append(name,[])

1:'Postal Code'
2:'Borough'
3:'Neighbourhood'

In [9]:
print(col)

[['Postal Code\n', []], ['Borough\n', []], ['Neighbourhood\n', []]]

In [10]:
col

Out[10]:
[['Postal Code\n', []], ['Borough\n', []], ['Neighbourhood\n', []]]

In [11]:
type(col)

Out[11]:
list

In [12]:
col = [['Postal Code', []], ['Borough', []], ['Neighbourhood', []]]

In [13]:
print(col)

[['Postal Code', []], ['Borough', []], ['Neighbourhood', []]]

In [14]:
#Since our first row is the header, data is stored on the second row onwards

for j in range(1,len(tr_elements)):
    #t is our j'th row
    tr=tr_elements[j]

    #If row is not of size 3, the //tr data is not from our table
    if len(tr)<3:
        break

    #i is the index of our column
    i=0

    #Iterate through each element of the row
    for t in tr.iterchildren():
        data=t.text.content()
        #check if row is empty
        if data>0:
            #Convert any numerical value to integers
            try:
                data=int(data)
            except:
                pass

            #Append the data to the empty list of the i'th column
            col[i].append(data)
            #Increment i for the next column
            i=i+1

In [15]:
print(col)

[['Postal Code', ['M1A1n', 'M2A1n', 'M3A1n', 'M4A1n', 'M5A1n', 'M6A1n', 'M7A1n', 'M8A1n', 'M9A1n', 'M10A1n', 'M2B1n', 'M3B1n', 'M4B1n', 'M5B1n', 'M6B1n', 'M7B1n', 'M8B1n', 'M9B1n', 'M10B1n', 'M11A1n', 'M12A1n', 'M13A1n', 'M14A1n', 'M15A1n', 'M16A1n', 'M17A1n', 'M18A1n', 'M19A1n', 'M20A1n', 'M21A1n', 'M22A1n', 'M23A1n', 'M24A1n', 'M25A1n', 'M26A1n', 'M27A1n', 'M28A1n', 'M29A1n', 'M30A1n', 'M31A1n', 'M32A1n', 'M33A1n', 'M34A1n', 'M35A1n', 'M36A1n', 'M37A1n', 'M38A1n', 'M39A1n', 'M40A1n', 'M41A1n', 'M42A1n', 'M43A1n', 'M44A1n', 'M45A1n', 'M46A1n', 'M47A1n', 'M48A1n', 'M49A1n', 'M50A1n', 'M51A1n', 'M52A1n', 'M53A1n', 'M54A1n', 'M55A1n', 'M56A1n', 'M57A1n', 'M58A1n', 'M59A1n', 'M60A1n', 'M61A1n', 'M62A1n', 'M63A1n', 'M64A1n', 'M65A1n', 'M66A1n', 'M67A1n', 'M68A1n', 'M69A1n', 'M70A1n', 'M71A1n', 'M72A1n', 'M73A1n', 'M74A1n', 'M75A1n', 'M76A1n', 'M77A1n', 'M78A1n', 'M79A1n', 'M80A1n', 'M81A1n', 'M82A1n', 'M83A1n', 'M84A1n', 'M85A1n', 'M86A1n', 'M87A1n', 'M88A1n', 'M89A1n', 'M90A1n', 'M91A1n', 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```



```
[26]: #Save to csv to check in Excel
df.to_csv("canadapostalcodes.csv",index=False)
```

```
Data cleaning

df.Borough.str.contains("Not assigned")

Out[27]:
0      True
1      True
2     False
3     False
4     False
5     False
6     False
7      True
8     False
9     False
10     False
11     False
12     False
13     False
14     False
15     True
16     True
17     False
18     True
19     True
20     False
21     False
22     False
23     False
24     True
25     True
26     False
27     False
28     True
29     True
30     False
31     False
32     True
33     True
34     True
35     True
36     False
37     True
38     True
39     False
40     False
41     False
42     True
43     True
44     True
45     False
46     False
47     False
48     False
49     False
50     False
51     True
52     True
53     True
54     False
55     False
56     False
57     False
58     False
59     False
60     True
61     True
62     True
63     False
64     False
65     False
66     False
67     False
68     True
69     True
70     True
71     True
72     False
73     False
74     False
75     False
76     False
77     False
78     True
79     True
80     False
81     False
82     False
83     False
84     False
85     False
86     False
87     True
88     True
89     False
90     False
91     False
92     False
93     False
94     False
95     False
96     True
97     True
98     False
99     False
100    False
101    True
102    False
103    False
104    False
105    True
106    True
107    False
108    False
109    False
110    True
111    False
112    False
113    False
114    False
115    False
116    False
117    False
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122    False
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124    True
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146    True
147    False
148    False
149    True
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151    False
152    True
153    False
154    True
155    True
156    False
157    False
158    True
159    True
160    False
161    True
162    True
163    True
164    True
165    False
166    True
167    True
168    False
169    False
170    True
171    True
172    True
173    True
174    True
175    True
176    True
177    True
178    False
179    True
Name: Borough, dtype: bool
```

```
In [28]: df1 = df[df.Borough.str.contains("Not assigned")]
```

```
In [29]: df1.shape
```

```
Out[29]: (103, 3)
```

```
In [30]: df1
```

|     | Postal Code | Borough          | Neighbourhood                                      |
|-----|-------------|------------------|--|
| 2   | M3A         | North York       | Parkwoods  |
| 3   | M4A         | North York       | Victoria Village                                   |
| 4   | M5A         | Downtown Toronto | Regent Park, Harbourfront                          |
| 5   | M6A         | North York       | Lawrence Manor, Lawrence Heights                   |
| 6   | M7A         | Downtown Toronto | Queen's Park, Ontario Provincial Government        |
| 8   | M9A         | Ebbwcoke         | Islington Avenue, Humber Valley Village            |
| 9   | M1B         | Scarborough      | Malvern, Rouge                                     |
| 11  | M3B         | North York       | Don Mills  |
| 12  | M4B         | East York        | Parkview Hill, Woodbine Gardens                    |
| 13  | M5B         | Downtown Toronto | Garden District, Ryerson                           |
| 14  | M6B         | North York       | Glencairn  |
| 17  | M6B         | Ebbwcoke         | West Deane Park, Princess Gardens, Martin Grov...  |
| 18  | M1C         | Scarborough      | Rouge Hill, Port Union, Highland Creek             |
| 20  | M3C         | North York       | Don Mills  |
| 21  | M4C         | East York        | Woodbine Heights                                   |
| 22  | M5C         | Downtown Toronto | St. James Town                                     |
| 23  | M6C         | York             | Humewood-Cedarvale                                 |
| 26  | M9C         | Ebbwcoke         | Eringate, Bloordeale Gardens, Old Burnhamthorpe... |
| 27  | M1E         | Scarborough      | Guildwood, Morningside, West Hill                  |
| 30  | M4E         | East Toronto     | The Beaches  |
| 31  | M5E         | Downtown Toronto | Bercy Park   |
| 32  | M6E         | York             | Caledonia-Fairbanks                                |
| 36  | M1G         | Scarborough      | Woburn   |
| 39  | M4G         | East York        | Leaside  |
| 40  | M5G         | Downtown Toronto | Central Bay Street                                 |
| 41  | M6G         | Downtown Toronto | Christie   |
| 45  | M1H         | Scarborough      | Cedarbrae  |
| 46  | M2H         | North York       | Hillcrest Village                                  |
| 48  | M4H         | East York        | Thorncliffe Park                                   |
| 49  | M5H         | Downtown Toronto | Richmond, Adelaide, King                           |
| 50  | M6H         | West Toronto     | Dufferin, Dovercourt Village                       |
| 54  | M1J         | Scarborough      | Scarborough Village                                |
| 55  | M2J         | North York       | Fairview, Henry Farm, Oriole                       |
| 56  | M3J         | North York       | Northwood Park, York University                    |
| 57  | M4J         | East York        | East Toronto, Broadview North (Old East York)      |
| 58  | M5J         | Downtown Toronto | Harbourfront East, Union Station, Toronto Islands  |
| 59  | M6J         | West Toronto     | Little Portugal, Trinity                           |
| 63  | M1K         | Scarborough      | Kennedy Park, Ionview, East Birchmount Park        |
| 64  | M2K         | North York       | Bayview Village                                    |
| 65  | M3K         | North York       | Downtown   |
| 66  | M4K         | East Toronto     | The Danforth West, Riverdale                       |
| 67  | M5K         | Downtown Toronto | Toronto Dominion Centre, Design Exchange           |
| 68  | M6K         | West Toronto     | Brookton, Parkdale Village, Exhibition Place       |
| 72  | M1L         | Scarborough      | Golden Mile, Clarks, Oakridge                      |
| 73  | M2L         | North York       | York Mills, Silver Hills                           |
| 74  | M3L         | North York       | Downtown   |
| 75  | M4L         | East Toronto     | India Bazaar, The Beaches West                     |
| 76  | M5L         | Downtown Toronto | Commerce Court, Victoria Hotel                     |
| 77  | M6L         | North York       | North Park, Maple Leaf Park, Upwood Park           |
| 80  | M6L         | North York       | Humber Summit                                      |
| 81  | M1M         | Scarborough      | Cliffside, Cliffcrest, Scarborough Village West    |
| 82  | M2M         | North York       | Willowdale, Newtonbrook                            |
| 83  | M3M         | North York       | Downtown   |
| 84  | M4M         | East Toronto     | Studio District                                    |
| 85  | M5M         | North York       | Bedford Park, Lawrence Manor East                  |
| 86  | M6M         | York             | Del Ray, Mount Dennis, Keelsdale and Silverthorn   |
| 89  | M6M         | North York       | Humberlea, Emery                                   |
| 90  | M1N         | Scarborough      | Birch Cliff, Cliffside West                        |
| 91  | M2N         | North York       | Willowdale, Willowdale East                        |
| 92  | M3N         | North York       | Downtown   |
| 93  | M4N         | Central Toronto  | Lawrence Park                                      |
| 94  | M5N         | Central Toronto  | Roselaw  |
| 95  | M6N         | York             | Runnymede, The Junction North                      |
| 96  | M6N         | York             | Weston   |
| 98  | M1P         | Scarborough      | Dorset Park, Wexford Heights, Scarborough Town...  |
| 100 | M2P         | North York       | York Mills West                                    |
| 102 | M4P         | Central Toronto  | Davisville North                                   |
| 103 | M5P         | Central Toronto  | Forest Hill North & West, Forest Hill Road Park    |
| 104 | M6P         | West Toronto     | High Park, The Junction South                      |
| 108 | M9P         | Ebbwcoke         | Westmount  |
| 109 | M1R         | Scarborough      | Wexford, Maryvale                                  |
| 109 | M2R         | North York       | Willowdale, Willowdale West                        |
| 111 | M4R         | Central Toronto  | North Toronto West, Lawrence Park                  |
| 112 | M5R         | Central Toronto  | The Annex, North Midtown, Yorkville                |
| 113 | M6R         | West Toronto     | Parkdale, Roncesvalles                             |
| 114 | M7R         | Mississauga      | Canada Post Gateway Processing Centre              |
| 116 | M9R         | Ebbwcoke         | Kingsview Village, St. Phillips, Martin Grove ...  |
| 117 | M1S         | Scarborough      | Agincourt  |
| 120 | M4S         | Central Toronto  | Davisville   |
| 121 | M5S         | Downtown Toronto | University of Toronto, Harbord                     |
| 122 | M6S         | West Toronto     | Runnymede, Swansea                                 |
| 126 | M1T         | Scarborough      | Clarks Corners, Tam O'Shanter, Sullivan            |
| 129 | M4T         | Central Toronto  | Moore Park, Summerhill East                        |
| 130 | M5T         | Downtown Toronto | Kensington Market, Chinatown, Grange Park          |
| 135 | M1V         | Scarborough      | Milliken, Agincourt North, Steeles East, L'Amo...  |
| 136 | M4V         | Central Toronto  | Summerhill West, Rathnelly, South Hill, Forest...  |
| 139 | M5V         | Downtown Toronto | CN Tower, King and Spadina, Railway Lands, Har...  |
| 142 | M6V         | Ebbwcoke         | New Toronto, Mimico South, Humber Bay Shores       |
| 143 | M9V         | Ebbwcoke         | South Steeles, Silverstone, Humbergate, Jamest...  |
| 144 | M1W         | Scarborough      | Steeles West, L'Amoreaux West                      |
| 147 | M4W         | Downtown Toronto | Rosedale   |
| 148 | M5W         | Downtown Toronto | Stn A PO Boxes                                     |
| 151 | M8W         | Ebbwcoke         | Alderwood, Long Branch                             |
| 152 | M9W         | Ebbwcoke         | Northwest, West Humber - Clairville                |
| 153 | M1X         | Scarborough      | Upper Rouge  |
| 156 | M4X         | Downtown Toronto | St. James Town, Cabbagetown                        |
| 157 | M5X         | Downtown Toronto | First Canadian Place, Underground city             |
| 160 | M8X         | Ebbwcoke         | The Kingsway, Montgomery Road, Old Mill North      |
| 165 | M4Y         | Downtown Toronto | Church and Wellesley                               |
| 168 | M7Y         | East Toronto     | Business reply mail Processing Centre, South C...  |
| 169 | M8Y         | Ebbwcoke         | Old Mill South, King's Mill Park, Sunnyside, Hu... |
| 178 | M8Z         | Ebbwcoke         | Mimico NW, The Queensway West, South of Bloor...   |

```
In [31]: df1.reset_index(drop=True, inplace=True)
```

```
In [32]: df1 #See and check all rows
```

```
Out[32]:
```

|     | Postal Code | Borough          | Neighbourhood                                      |
|-----|-------------|------------------|--|
| 0   | M3A         | North York       | Parkwoods  |
| 1   | M4A         | North York       | Victoria Village                                   |
| 2   | M5A         | Downtown Toronto | Regent Park, Harbourfront                          |
| 3   | M6A         | North York       | Lawrence Manor, Lawrence Heights                   |
| 4   | M7A         | Downtown Toronto | Queen's Park, Ontario Provincial Government        |
| 5   | M9A         | Ebbwcoke         | Islington Avenue, Humber Valley Village            |
| 6   | M1B         | Scarborough      | Malvern, Rouge                                     |
| 7   | M3B         | North York       | Don Mills  |
| 8   | M4B         | East York        | Parkview Hill, Woodbine Gardens                    |
| 9   | M5B         | Downtown Toronto | Garden District, Ryerson                           |
| 10  | M6B         | North York       | Glencairn  |
| 11  | M6B         | Ebbwcoke         | West Deane Park, Princess Gardens, Martin Grov...  |
| 12  | M1C         | Scarborough      | Rouge Hill, Port Union, Highland Creek             |
| 13  | M3C         | North York       | Don Mills  |
| 14  | M4C         | East York        | Woodbine Heights                                   |
| 15  | M5C         | Downtown Toronto | St. James Town                                     |
| 16  | M6C         | York             | Humewood-Cedarvale                                 |
| 17  | M9C         | Ebbwcoke         | Eringate, Bloordeale Gardens, Old Burnhamthorpe... |
| 18  | M1E         | Scarborough      | Guildwood, Morningside, West Hill                  |
| 19  | M4E         | East Toronto     | The Beaches  |
| 20  | M5E         | Downtown Toronto | Bercy Park   |
| 21  | M6E         | York             | Caledonia-Fairbanks                                |
| 22  | M1G         | Scarborough      | Woburn   |
| 23  | M4G         | East York        | Leaside  |
| 24  | M5G         | Downtown Toronto | Central Bay Street                                 |
| 25  | M6G         | Downtown Toronto | Christie   |
| 26  | M1H         | Scarborough      | Cedarbrae  |
| 27  | M2H         | North York       | Hillcrest Village                                  |
| 28  | M3H         | North York       | Bathurst Manor, Wilson Heights, Downsview North    |
| 29  | M4H         | East York        | Thorncliffe Park                                   |
| 30  | M5H         | Downtown Toronto | Richmond, Adelaide, King                           |
| 31  | M6H         | West Toronto     | Dufferin, Dovercourt Village                       |
| 32  | M1J         | Scarborough      | Scarborough Village                                |
| 33  | M2J         | North York       | Fairview, Henry Farm, Oriole                       |
| 34  | M3J         | North York       | Northwood Park, York University                    |
| 35  | M4J         | East York        | East Toronto, Broadview North (Old East York)      |
| 36  | M5J         | Downtown Toronto | Harbourfront East, Union Station, Toronto Islands  |
| 37  | M6J         | West Toronto     | Little Portugal, Trinity                           |
| 38  | M1K         | Scarborough      | Kennedy Park, Ionview, East Birchmount Park        |
| 39  | M2K         | North York       | Bayview Village                                    |
| 40  | M3K         | North York       | Downtown   |
| 41  | M4K         | East Toronto     | The Danforth West, Riverdale                       |
| 42  | M5K         | Downtown Toronto | Toronto Dominion Centre, Design Exchange           |
| 43  | M6K         | West Toronto     | Brookton, Parkdale Village, Exhibition Place       |
| 44  | M1L         | Scarborough      | Golden Mile, Clarks, Oakridge                      |
| 45  | M2L         | North York       | York Mills, Silver Hills                           |
| 46  | M3L         | North York       | Downtown   |
| 47  | M4L         | East Toronto     | India Bazaar, The Beaches West                     |
| 48  | M5L         | Downtown Toronto | Commerce Court, Victoria Hotel                     |
| 49  | M6L         | North York       | North Park, Maple Leaf Park, Upwood Park           |
| 50  | M6L         | North York       | Humber Summit                                      |
| 51  | M1M         | Scarborough      | Cliffside, Cliffcrest, Scarborough Village West    |
| 52  | M2M         | North York       | Willowdale, Newtonbrook                            |
| 53  | M3M         | North York       | Downtown   |
| 54  | M4M         | East Toronto     | Studio District                                    |
| 55  | M5M         | North York       | Bedford Park, Lawrence Manor East                  |
| 56  | M6M         | York             | Del Ray, Mount Dennis, Keelsdale and Silverthorn   |
| 57  | M6M         | North York       | Humberlea, Emery                                   |
| 58  | M1N         | Scarborough      | Birch Cliff, Cliffside West                        |
| 59  | M2N         | North York       | Willowdale, Willowdale East                        |
| 60  | M3N         | North York       | Downtown   |
| 61  | M4N         | Central Toronto  | Lawrence Park                                      |
| 62  | M5N         | Central Toronto  | Roselaw  |
| 63  | M6N         | York             | Runnymede, The Junction North                      |
| 64  | M6N         | York             | Weston   |
| 65  | M1P         | Scarborough      | Dorset Park, Wexford Heights, Scarborough Town...  |
| 66  | M2P         | North York       | York Mills West                                    |
| 67  | M4P         | Central Toronto  | Davisville North                                   |
| 68  | M5P         | Central Toronto  | Forest Hill North & West, Forest Hill Road Park    |
| 69  | M6P         | West Toronto     | High Park, The Junction South                      |
| 70  | M9P         | Ebbwcoke         | Westmount  |
| 71  | M1R         | Scarborough      | Wexford, Maryvale                                  |
| 72  | M2R         | North York       | Willowdale, Willowdale West                        |
| 73  | M4R         | Central Toronto  | North Toronto West, Lawrence Park                  |
| 74  | M5R         | Central Toronto  | The Annex, North Midtown, Yorkville                |
| 75  | M6R         | West Toronto     | Parkdale, Roncesvalles                             |
| 76  | M7R         | Mississauga      | Canada Post Gateway Processing Centre              |
| 77  | M9R         | Ebbwcoke         | Kingsview Village, St. Phillips, Martin Grove ...  |
| 78  | M1S         | Scarborough      | Agincourt  |
| 79  | M4S         | Central Toronto  | Davisville   |
| 80  | M5S         | Downtown Toronto | University of Toronto, Harbord                     |
| 81  | M6S         | West Toronto     | Runnymede, Swansea                                 |
| 82  | M1T         | Scarborough      | Clarks Corners, Tam O'Shanter, Sullivan            |
| 83  | M4T         | Central Toronto  | Moore Park, Summerhill East                        |
| 84  | M5T         | Downtown Toronto | Kensington Market, Chinatown, Grange Park          |
| 85  | M1V         | Scarborough      | Milliken, Agincourt North, Steeles East, L'Amo...  |
| 86  | M4V         | Central Toronto  | Summerhill West, Rathnelly, South Hill, Forest...  |
| 87  | M5V         | Downtown Toronto | CN Tower, King and Spadina, Railway Lands, Har...  |
| 88  | M6V         | Ebbwcoke         | New Toronto, Mimico South, Humber Bay Shores       |
| 89  | M9V         | Ebbwcoke         | South Steeles, Silverstone, Humbergate, Jamest...  |
| 90  | M1W         | Scarborough      | Steeles West, L'Amoreaux West                      |
| 91  | M4W         | Downtown Toronto | Rosedale   |
| 92  | M5W         | Downtown Toronto | Stn A PO Boxes                                     |
| 93  | M8W         | Ebbwcoke         | Alderwood, Long Branch                             |
| 94  | M9W         | Ebbwcoke         | Northwest, West Humber - Clairville                |
| 95  | M1X         | Scarborough      | Upper Rouge  |
| 96  | M4X         | Downtown Toronto | St. James Town, Cabbagetown                        |
| 97  | M5X         | Downtown Toronto | First Canadian Place, Underground city             |
| 98  | M8X         | Ebbwcoke         | The Kingsway, Montgomery Road, Old Mill North      |
| 99  | M4Y         | Downtown Toronto | Church and Wellesley                               |
| 100 | M7Y         | East Toronto     | Business reply mail Processing Centre, South C...  |
| 101 | M8Y         | Ebbwcoke         | Old Mill South, King's Mill Park, Sunnyside, Hu... |
| 102 | M8Z         | Ebbwcoke         | Mimico NW, The Queensway West, South of Bloor...   |

```
In [33]: print("The number of rows of the dataframe:", df1.shape)
```

```
The number of rows of the dataframe: (103, 3)
```

```
In [34]: #df1.to_csv("postalcodecleaned.csv",index=False) #save a csv file
```

## Section 2

Now that you have built a dataframe of the postal code of each neighborhood along with the borough name and neighborhood name, in order to utilize the Foursquare location data, we need to get the latitude and the longitude coordinates of each neighborhood.

Use the Geocoder package or the csv file to create the following dataframe

```
In [35]: #import the geospatial data
```

```
geodata = pd.read_csv("Geospatial_Coordinates.csv")
```

```
geodata.head()
```

|   | Postal Code | Borough   | Latitude   | Longitude                                   |
|---|-------------|-----------|------------|---|
| 0 | M1B         | 43.806686 | -79.194353 | Parkwoods                                   |
| 1 | M1C         | 43.784335 | -79.160487 | Victoria Village                            |
| 2 | M1E         | 43.763575 | -79.188711 | Regent Park, Harbourfront                   |
| 3 | M1G         | 43.770992 | -79.216917 | Lawrence Manor, Lawrence Heights            |
| 4 | M1H         | 43.773136 | -79.239476 | Queen's Park, Ontario Provincial Government |

```
In [37]: df1.head()
```

```
Out[37]:
```

|   | Postal Code | Borough          | Neighbourhood                               |
|---|-------------|------------------|---|
| 0 | M3A         | North York       | Parkwoods                                   |
| 1 | M4A         | North York       | Victoria Village                            |
| 2 | M5A         | Downtown Toronto | Regent Park, Harbourfront                   |
| 3 | M6A         | North York       | Lawrence Manor, Lawrence Heights            |
| 4 | M7A         | Downtown Toronto | Queen's Park, Ontario Provincial Government |

```
In [38]: df2 = df1.merge(geodata, how="inner", left_on="Postal Code", right_on="PostalCode")
```

## Dataframe for Section 2 is below:

```
In [39]: df2.head()
```

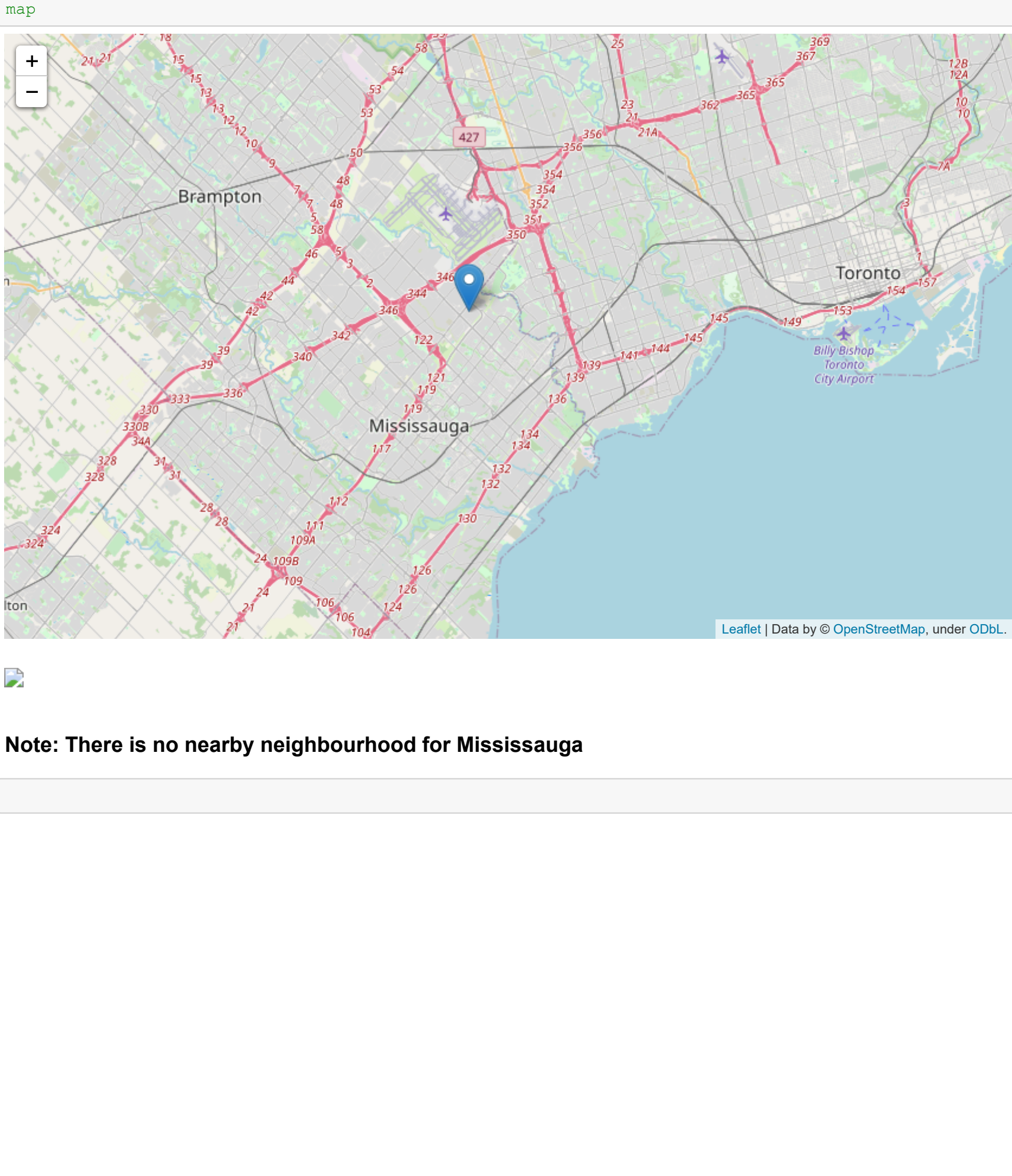
|    |     |                 |  |           |            |
|----|-----|-----------------|--|-----------|------------|
| 68 | M5P | Central Toronto | Forest Hill North & West, Forest Hill Road Park      | 43.609548 | -79.411307 |
| 69 | M6P | West Toronto    | High Park, The Junction South                        | 43.661608 | -79.464763 |
| 70 | M9P | Ettobikee       | Westmont   | 43.695319 | -79.532242 |
| 71 | M1R | Scarborough     | Wexford, Mayvale                                     | 43.750072 | -79.295849 |
| 72 | M2R | North York      | Willowdale, Willowdale West                          | 43.782736 | -79.422559 |
| 73 | M4R | Central Toronto | North Toronto West, Lawrence Park                    | 43.715383 | -79.405678 |
| 74 | M5R | Central Toronto | The Annex, North Midtown, Yorkville                  | 43.672710 | -79.405678 |
| 75 | M6R | West Toronto    | Parkdale, Roncesvalles                               | 43.648960 | -79.456325 |
| 76 | M7R | Mississauga     | Canada Post Gateway Processing Centre                | 43.639666 | -79.615819 |
| 77 | M9R | Ettobikee       | Kinrossville Village, St. Phillips, Martin Grove ... | 43.688005 | -79.554724 |

```
In [40]: df2.drop(["PostalCode"],axis=1,inplace=True)
```

```
In [41]: df2
```

|    | Postal Code | Borough          | Neighbourhood                                      | 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                          | 43.654280 | -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 |
| 5  | M9A         | Ebbwcoke         | Islington Avenue, Humber Valley Village            | 43.695344 | -79.318389 |
| 6  | M1B         | Scarborough      | Malvern, Rouge                                     | 43.806866 | -79.194353 |
| 7  | M3B         | North York       | Don Mills  | 43.745906 | -79.352188 |
| 8  | M4B         | East York        | Parkview Hill, Woodbine Gardens                    | 43.703397 | -79.309337 |
| 9  | M5B         | Downtown Toronto | Garden District, Ryerson                           | 43.657162 | -79.378937 |
| 10 | M6B         | North York       | Glencairn  | 43.709577 | -79.445073 |
| 11 | M9B         | Ebbwcoke         | West Deane Park, Princess Gardens, Martin Grov...  | 43.650943 | -79.554724 |
| 12 | M1C         | Scarborough      | Rouge Hill, Port Union, Highland Creek             | 43.784535 | -79.160487 |
| 13 | M3C         | North York       | Don Mills  | 43.725900 | -79.340923 |
| 14 | M4C         | East York        | Woodbine Heights                                   | 43.695344 | -79.318389 |
| 15 | M5C         | Downtown Toronto | St. James Town                                     | 43.651494 | -79.375418 |
| 16 | M6C         | Ebbwcoke         | Humewood-Cedarvale                                 | 43.651494 | -79.426191 |
| 17 | M9C         | Ebbwcoke         | Eringate, Bloordeale Gardens, Old Burnhamthorpe... | 43.643515 | -79.426191 |
| 18 | M1E         | Scarborough      | Guildwood, Morningside, West Hill                  | 43.763573 | -79.188711 |
| 19 | M4E         | East Toronto     | The Beaches  | 43.628947 | -79.501321 |
| 20 | M5E         | Downtown Toronto | Bercy Park   | 43.644771 | -79.333016 |
| 21 | M6E         | North York       | Caledonia-Fairbanks                                | 43.680026 | -79.453512 |
| 22 | M1G         | Scarborough      | Woburn   | 43.770992 | -79.216917 |
| 23 | M4G         | East York        | Leaside  | 43.709600 | -79.363452 |
| 24 | M5G         | Downtown Toronto | Central Bay Street                                 | 43.657952 | -79.378937 |
| 25 | M6G         | Downtown Toronto | Christie   | 43.69542  | -7         |





**Note: There is no nearby neighbourhood for Mississauga**

In [ 49 ] :