

# Week 5- Segmenting and Clustering Neighbourhoods

February 6, 2019

## 1 Segmenting and Clustering Neighborhoods in Fredericton, NB

### 1.0.1 Applied Data Science Capstone Week 5 Peer-Graded Project Report

By Prakash Koshti - 6th Feb, 2019

#### 1.1 Introduction to the opportunity

Fredericton is the Capital City of the only Canadian fully-bilingual Province of New Brunswick and is beautifully located on the banks of the Saint John River. While one of the least populated provincial capital cities with a population base of less than 60 thousand residents, it offers a wide spectrum of venues and is a government, university and cultural hub.

As the city grows and develops, it becomes increasingly important to examine and understand it quantitatively. The City of Fredericton provides open data for everyone and encourages entrepreneurial use to develop services for the benefit of its citizens.

Developers, investors, policy makers and/or city planners have an interest in answering the following questions as the need for additional services and citizen protection:

1. What neighbourhoods have the highest crime?
2. Is population density correlated to crime level?
3. Using Foursquare data, what venues are most common in different locations within the city?
4. Does the Knowledge Park really need a coffee shop?
5. Does the Open Data project have specific enough or thick enough data to empower decisions to be made or is it too aggregate to provide value in its current detail?

Let's find out.

```
In [2]: from PIL import Image
import requests
url = 'http://www.tourismfredericton.ca/sites/default/files/field/image/fredericton.jpg'
im = Image.open(requests.get(url, stream=True).raw)
im
```

Out[2] :



## 1.2 Data

### 1.2.1 To understand and explore we will need the following City of Fredericton Open Data:

1. Open Data Site: <http://data-fredericton.opendata.arcgis.com/>
2. Fredericton Neighbourhoods: <http://data-fredericton.opendata.arcgis.com/datasets/neighbourhoods-quartiers>
3. Fredericton Crime by Neighbourhood: <http://data-fredericton.opendata.arcgis.com/datasets/crime-by-neighbourhood-2017--crime-par-quartier-2017>
4. Fredericton Census Tract Demographics: <http://data-fredericton.opendata.arcgis.com/datasets/census-tract-demographics--donn%C3%A9es-d%C3%A9mographiques-du-secteur-de-recensement>
5. Fredericton locations of interest: <https://github.com/JasonLURquhart/Applied-Data-Science-Capstone/blob/master/Fredericton%20Locations.xlsx>
6. Foursquare Developers Access to venue data: <https://foursquare.com/>

Using this data will allow exploration and examination to answer the questions. The neighbourhood data will enable us to properly group crime by neighbourhood. The Census data will enable us to then compare the population density to examine if areas of highest crime are also most densely populated. Fredericton locations of interest will then allow us to cluster and quantitatively understand the venues most common to that location.

This is going to be interesting...

## **1.3 Methodology**

All steps are referenced below in the Appendix: Analysis section.

The methodology will include:

1. Loading each data set
2. Examine the crime frequency by neighbourhood
3. Study the crime types and then pivot analysis of crime type frequency by neighbourhood
4. Understand correlation between crimes and population density
5. Perform k-means statistical analysis on venues by locations of interest based on findings from crimes and neighbourhood
6. Determine which venues are most common statistically in the region of greatest crime count then in all other locations of interest.
7. Determine if an area, such as the Knowledge Park needs a coffee shop.

### **1.3.1 Loading the data**

After loading the applicable libraries, the referenced geojson neighbourhood data was loaded from the City of Fredericton Open Data site. This dataset uses block polygon shape coordinates which are better for visualization and comparison. The City also uses Ward data but the Neighbourhood location data is more accurate and includes more details. The same type of dataset was then loaded for the population density from the Stats Canada Census tracts.

The third dataset, an excel file, "Crime by Neighbourhood 2017" downloaded from the City of Fredericton Open Data site is found under the Public Safety domain. This dataset was then uploaded for the analysis. It's interesting to note the details of this dataset are aggregated by neighbourhood. It is not an exhaustive set by not including all crimes (violent offenses) nor specific location data of the crime but is referenced by neighbourhood.

This means we can gain an understanding of the crime volume by type by area but not specific enough to understand the distribution properties. Valuable questions such as, "are these crimes occurring more often in a specific area and at a certain time by a specific demographic of people?" cannot be answered nor explored due to what is reasonably assumed to be personal and private information with associated legal risks.

There is value to the city to explore the detailed crime data using data science to predict frequency, location, timing and conditions to best allocated resources for the benefit of its citizens and its police force. However, human behaviour is complex requiring thick profile data by individual and the conditions surrounding the event(s). To be sufficient for reliable future prediction it would need to demonstrate validity, currency, reliability and sufficiency.

### **1.3.2 Exploring the data**

Exploring the count of crimes by neighbourhood gives us the first glimpse into the distribution.

One note is the possibility neighbourhoods names could change at different times. The crime dataset did not mention which specific neighbourhood naming dataset it was using but we assumed the neighbourhood data provided aligned with the neighbourhoods used in the crime data. It may be beneficial for the City to note and timestamp neighbourhood naming in the future or simply reference with neighbourhood naming file it used for the crime dataset.

An example of data errors: There was an error found in the naming of the neighbourhood "Platt". The neighbourhood data stated "Plat" while the crime data stated "Platt". Given the crime

dataset was most simple to manipulate it was modified to "Plat". The true name of the neighbourhood is "Platt".

**First Visualization of Crime** Once the data was prepared, a choropleth map was created to view the crime count by neighbourhood. As expected the region of greatest crime count was found in the downtown and Platt neighbourhoods.

Examining the crime types enables us to learn the most frequent occurring crimes which we then plot as a bar chart to see most frequently type.

Theft from motor vehicles is most prevalent in the same area as the most frequent crimes. It's interesting to note this area is mostly residential and most do not have garages. It would be interesting to further examine if surveillance is a deterrent for motor vehicle crimes in the downtown core compared to low surveillance in the Platt neighbourhood.

**Examining 2nd most common crime given it is specific: theft from vehicles** After exploring the pivot table showing Crime\_Type by Neighbourhood, we drill into a specific type of crime, theft from vehicles and plot the choropleth map to see which area has the greatest frequency.

Again, the Platt neighbourhood appears as the most frequent.

Is this due to population density?

**Introducing the Census data to explore the correlation between crime frequency and population density.** Visualising the population density enables us to determine that the Platt neighbourhood has lower correlation to crime frequency than I would have expected.

It would be interesting to further study the Census data and if this captures the population that is renting or more temporary/transient population, given the City is a University hub.

**Look at specific locations to understand the connection to venues using Foursquare data** Loading the "Fredericton Locations" data enables us to perform a statistical analysis on the most common venues by location.

We might wonder if the prevalence of bars and clubs in the downtown region has something to do with the higher crime rate in the near Platt region.

Plotting the latitude and longitude coordinates of the locations of interest onto the crime choropleth map enables us to now study the most common venues by using the Foursquare data.

**Analysing each Location** Grouping rows by location and the mean of the frequency of occurrence of each category we venue categories we study the top five most common venues.

Putting this data into a pandas dataframe we can then determine the most common venues by location and plot onto a map.

## 1.4 Results

The analysis enabled us to discover and describe visually and quantitatively:

1. Neighbourhoods in Fredericton
2. Crime frequency by neighbourhood
3. Crime type frequency and statistics. The mean crime count in the City of Fredericton is 22.

4. Crime type count by neighbourhood. Theft from motor vehicles is most prevalent in the same area as the most frequent crimes. It's interesting to note this area is mostly residential and most do not have garages. It would be interesting to further examine if surveillance is a deterrent for motor vehicle crimes in the downtown core compared to low surveillance in the Platt neighbourhood.

4.1 Motor Vehicle crimes less than \$5000 analysis by neighbourhood and resulting statistics. The most common crime is Other Theft less than 5k followed by Motor Vehicle Theft less than 5k. There is a mean of 6 motor vehicle thefts less than 5k by neighbourhood in the City.

4.2 That population density and resulting visual correlation is not strongly correlated to crime frequency. Causation for crime is not able to be determined given lack of open data specificity by individual and environment.

4.3 Using k-menas, we were able to determine the top 10 most common venues within a 1 km radius of the centroid of the highest crime neighbourhood. The most common venues in the highest crime neighbourhood are coffee shops followed by Pubs and Bars.

While, it is not valid, consistent, reliable or sufficient to assume a higher concentration of the combination of coffee shops, bars and clubs predicts the amount of crime occurrence in the City of Fredericton, this may be a part of the model needed to be able to in the future.

1. We were able to determine the top 10 most common venues by location of interest.
2. Statistically, we determined there are no coffee shops within the Knowledge Park clusters.

## 1.5 Discussion and Recommendations

The City of Fredericton Open Data enables us to gain an understanding of the crime volume by type by area but not specific enough to understand the distribution properties. Valuable questions such as, "are these crimes occurring more often in a specific area and at a certain time by a specific demographic of people?" cannot be answered nor explored due to what is reasonably assumed to be personal and private information with associated legal risks.

There is value to the city to explore the detailed crime data using data science to predict frequency, location, timing and conditions to best allocated resources for the benefit of its citizens and its police force. However, human behaviour is complex requiring thick profile data by individual and the conditions surrounding the event(s). To be sufficient for reliable future prediction it would need to demonstrate validity, currency, reliability and sufficiency.

A note of caution is the possibility neighbourhoods names could change. The crime dataset did not mention which specific neighbourhood naming dataset it was using but we assumed the neighbourhood data provided aligned with the neighbourhoods used in the crime data. It may be beneficial for the City to note and timestamp neighbourhood naming in the future or simply reference with neighbourhood naming file it used for the crime dataset.

Errors exist in the current open data. An error was found in the naming of the neighbourhood "Platt". The neighbourhood data stated "Plat" while the crime data stated "Platt". Given the crime dataset was most simple to manipulate it was modified to "Plat". The true name of the neighbourhood is "Platt".

Theft from motor vehicles is most prevalent in the same area as the most frequent crimes. It is interesting to note this area is mostly residential and most do not have garages. It would be interesting to further examine if surveillance is a deterrent for motor vehicle crimes in the downtown core compared to low surveillance in the Platt neighbourhood.

It would be interesting to further study the Census data and if this captures the population that is renting or more temporary/transient poplution, given the City is a University hub.

Given the findings of the top 10 most frequent venues by locations of interest, the Knowledge Park does not have Coffee Shops in the top 10 most common venues as determined from the Foursquare dataset. Given this area has the greatest concentration of stores and shops as venues, it would be safe to assume a coffee shop would be beneficial to the business community and the citizens of Fredericton.

## 1.6 Conclusion

Using a combination of datasets from the City of Fredericton Open Data project and Foursquare venue data we were able to analyse, discover and describe neighbourhoods, crime, population density and statistically describe quantitatively venues by locations of interest.

While overall, the City of Fredericton Open Data is interesting, it misses the details required for true valued quantitiative analysis and predictive analytics which would be most valued by investors and developers to make appropriate investments and to minimize risk.

The Open Data project is a great start and empowers the need for a "Citizens Like Me" model to be developed where citizens of digital Fredericton are able to share their data as they wish for detailed analysis that enables the creation of valued services.

In [ ]:

## 2 APPENDIX: Analysis

### 2.0.1 Load Libraries

```
In [1]: import numpy as np # library to handle data in a vectorized manner

import pandas as pd # library for data analysis
pd.set_option('display.max_columns', None)
pd.set_option('display.max_rows', None)

import json # library to handle JSON files

!conda install -c conda-forge geopy --yes # uncomment this line if you haven't completed
from geopy.geocoders import Nominatim # convert an address into latitude and longitude values

import requests # library to handle requests
from pandas.io.json import json_normalize # transform 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

# for webscraping import BeautifulSoup
```

```

from bs4 import BeautifulSoup

import xml

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

print('Libraries imported.')

```

Solving environment: done

## Package Plan ##

environment location: /home/jupyterlab/conda

added / updated specs:

- geopy

The following packages will be downloaded:

package		build		
geographiclib-1.49		py_0	32 KB	conda-forge
cryptography-2.4.2		py36h1ba5d50_0	618 KB	
openssl-1.1.1a		h14c3975_1000	4.0 MB	conda-forge
libarchive-3.3.3		h5d8350f_5	1.5 MB	
grpcio-1.16.1		py36hf8bcb03_1	1.1 MB	
geopy-1.18.1		py_0	51 KB	conda-forge
conda-4.6.2		py36_0	869 KB	conda-forge
libssh2-1.8.0		1	239 KB	conda-forge
python-3.6.8		h0371630_0	34.4 MB	
		Total:	42.7 MB	

The following NEW packages will be INSTALLED:

geographiclib: 1.49-py_0	conda-forge
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The following packages will be UPDATED:

conda:	4.5.12-py36_1000	conda-forge --> 4.6.2-py36_0	conda-forge
cryptography:	2.3.1-py36hb7f436b_1000	conda-forge --> 2.4.2-py36h1ba5d50_0	
curl:	7.63.0-h646f8bb_1000	conda-forge --> 7.63.0-hbc83047_1000	
geopy:	1.11.0-py36_0	conda-forge --> 1.18.1-py_0	conda-forge
grpcio:	1.16.0-py36h4f00d22_1000	conda-forge --> 1.16.1-py36hf8bcb03_1	
libcurl:	7.63.0-h01ee5af_1000	conda-forge --> 7.63.0-h20c2e04_1000	
openssl:	1.0.2p-h14c3975_1002	conda-forge --> 1.1.1a-h14c3975_1000	conda-forge

```
pycurl:      7.43.0.2-py36hb7f436b_0          --> 7.43.0.2-py36h1ba5d50_0
python:      3.6.6-hd21baee_1003      conda-forge --> 3.6.8-h0371630_0
qt:         5.9.6-h8703b6f_2                  --> 5.9.7-h5867ecd_1
```

The following packages will be DOWNGRADED:

```
krb5:        1.16.2-hc83ff2d_1000      conda-forge --> 1.16.1-h173b8e3_7
libarchive:   3.3.3-ha149a29_1000      conda-forge --> 3.3.3-h5d8350f_5
libssh2:     1.8.0-h1ad7b7a_1003      conda-forge --> 1.8.0-1      conda-forge
```

#### Downloading and Extracting Packages

```
geographiclib-1.49 | 32 KB    | #####|#####|#####|#####|#####|#####|#####|#####| 100%
cryptography-2.4.2 | 618 KB   | #####|#####|#####|#####|#####|#####|#####|#####| 100%
openssl-1.1.1a    | 4.0 MB   | #####|#####|#####|#####|#####|#####|#####|#####| 100%
libarchive-3.3.3   | 1.5 MB   | #####|#####|#####|#####|#####|#####|#####|#####| 100%
grpcio-1.16.1     | 1.1 MB   | #####|#####|#####|#####|#####|#####|#####|#####| 100%
geopy-1.18.1       | 51 KB    | #####|#####|#####|#####|#####|#####|#####|#####| 100%
conda-4.6.2        | 869 KB   | #####|#####|#####|#####|#####|#####|#####|#####| 100%
libssh2-1.8.0       | 239 KB   | #####|#####|#####|#####|#####|#####|#####|#####| 100%
python-3.6.8        | 34.4 MB  | #####|#####|#####|#####|#####|#####|#####|#####| 100%
```

Preparing transaction: done

Verifying transaction: done

Executing transaction: done

Collecting package metadata: done

Solving environment: done

# All requested packages already installed.

Libraries imported.

```
In [2]: r = requests.get('https://opendata.arcgis.com/datasets/823d86e17a6d47808c6e4f1c2dd97928_')
fredericton_geo = r.json()
```

```
In [3]: neighborhoods_data = fredericton_geo['features']
```

```
In [4]: neighborhoods_data[0]
```

```
Out[4]: {'type': 'Feature',
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    'Shape_Area': 32431889.0002},
  'geometry': {'type': 'Polygon',
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 [-66.6318085641854, 45.8878357293373]]}]]}
```

```
In [5]: g = requests.get('https://opendata.arcgis.com/datasets/6179d35eacb144a5b5fdcc869f86dfb5_')
demog_geo = g.json()

demog_data = demog_geo['features']
demog_data[0]
```

```
Out[5]: {'type': 'Feature',
 'properties': {'FID': 1,
 'OBJECTID': 501,
 'DBUID': '1310024304',
 'DAUID': '13100243',
 'CDUID': '1310',
 'CTUID': '3200002.00',
 'CTNAME': '0002.00',
```

```

'DBuild_1': '1310024304',
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'DBtdwell20': 25,
'DBurdwell2': 22,
'Shape_Leng': 0.00746165241824,
'Shape_Area': 2.81310751889e-06,
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[-66.6378263667982, 45.9510868696778],
[-66.636944377136, 45.9521037018384],
[-66.634784212921, 45.9519239912381]]]}}

```

In [6]: `crime_df = pd.read_csv("Crime_by_neighbourhood_2017.csv")  
crime_df.head()`

Out[6]:

	Neighbourhood	From_Date	To_Date	\
0	Fredericton South	2017-01-05T00:00:00.000Z	2017-01-26T00:00:00.000Z	
1	Fredericton South	2017-03-04T00:00:00.000Z	2017-03-06T00:00:00.000Z	
2	Fredericton South	2017-05-07T00:00:00.000Z		NaN
3	Fredericton South	2017-06-20T00:00:00.000Z	2017-06-21T00:00:00.000Z	
4	Fredericton South	2017-07-09T00:00:00.000Z	2017-07-10T00:00:00.000Z	

	Crime_Code	Crime_Type	Ward	City	FID
0	2120	B&E NON-RESIDNCE	7	Fredericton	1
1	2120	B&E NON-RESIDNCE	7	Fredericton	2
2	2120	B&E NON-RESIDNCE	12	Fredericton	3
3	2120	B&E NON-RESIDNCE	12	Fredericton	4
4	2120	B&E NON-RESIDNCE	7	Fredericton	5

In [7]: `crime_df.drop(['From_Date', 'To_Date'], axis=1, inplace=True)`

## 2.1 What is the crime count by neighbourhood?

In [8]: `crime_data = crime_df.groupby(['Neighbourhood']).size().to_frame(name='Count').reset_index()  
crime_data`

Out[8]:

	Neighbourhood	Count
0	Barkers Point	47
1	Brookside	54
2	Brookside Estates	9
3	Brookside Mini Home Park	5
4	College Hill	41
5	Colonial heights	9
6	Cotton Mill Creek	4
7	Diamond Street	1

8	Doak Road	1
9	Douglas	3
10	Downtown	127
11	Dun's Crossing	18
12	Forest Hill	12
13	Fredericton South	85
14	Fulton Heights	36
15	Garden Creek	13
16	Garden Place	4
17	Gilridge Estates	3
18	Golf Club	7
19	Grasse Circle	1
20	Greenwood Minihome Park	2
21	Hanwell North	8
22	Heron Springs	3
23	Highpoint Ridge	5
24	Kelly's Court Minihome Park	1
25	Knob Hill	4
26	Knowledge Park	1
27	Lian / Valcore	7
28	Lincoln	13
29	Lincoln Heights	14
30	Main Street	78
31	Marysville	39
32	McKnight	4
33	McLeod Hill	3
34	Monteith / Talisman	12
35	Montogomery / Prospect East	16
36	Nashwaassis	25
37	Nethervue Minihome Park	1
38	North Devon	113
39	Northbrook Heights	10
40	Platt	198
41	Poet's Hill	4
42	Prospect	81
43	Rail Side	3
44	Regiment Creek	1
45	Royal Road	7
46	Saint Mary's First Nation	25
47	Saint Thomas University	1
48	Sandyville	9
49	Serenity Lane	2
50	Shadowood Estates	5
51	Silverwood	12
52	Skyline Acrea	27
53	South Devon	68
54	Southwood Park	16
55	Springhill	1

56	Sunshine Gardens	10
57	The Hill	44
58	The Hugh John Flemming Forestry Center	3
59	University Of New Brunswick	15
60	Waterloo Row	9
61	Wesbett / Case	1
62	West Hills	5
63	Williams / Hawkins Area	17
64	Woodstock Road	41
65	Youngs Crossing	16

In [9]: crime\_data.describe()

Out[9]:

	Count
count	66.000000
mean	22.121212
std	34.879359
min	1.000000
25%	3.000000
50%	9.000000
75%	23.250000
max	198.000000

In [10]: crime\_data.rename(index=str, columns={'Neighbourhood': 'Neighbour', 'Count': 'Crime\_Count'})  
crime\_data

Out[10]:

	Neighbour	Crime_Count
0	Barkers Point	47
1	Brookside	54
2	Brookside Estates	9
3	Brookside Mini Home Park	5
4	College Hill	41
5	Colonial heights	9
6	Cotton Mill Creek	4
7	Diamond Street	1
8	Doak Road	1
9	Douglas	3
10	Downtown	127
11	Dun's Crossing	18
12	Forest Hill	12
13	Fredericton South	85
14	Fulton Heights	36
15	Garden Creek	13
16	Garden Place	4
17	Gilridge Estates	3
18	Golf Club	7
19	Grasse Circle	1
20	Greenwood Minihome Park	2
21	Hanwell North	8

22	Heron Springs	3
23	Highpoint Ridge	5
24	Kelly's Court Minihome Park	1
25	Knob Hill	4
26	Knowledge Park	1
27	Lian / Valcore	7
28	Lincoln	13
29	Lincoln Heights	14
30	Main Street	78
31	Marysville	39
32	McKnight	4
33	McLeod Hill	3
34	Monteith / Talisman	12
35	Montogomery / Prospect East	16
36	Nashwaaksis	25
37	Nethervue Minihome Park	1
38	North Devon	113
39	Northbrook Heights	10
40	Platt	198
41	Poet's Hill	4
42	Prospect	81
43	Rail Side	3
44	Regiment Creek	1
45	Royal Road	7
46	Saint Mary's First Nation	25
47	Saint Thomas University	1
48	Sandyville	9
49	Serenity Lane	2
50	Shadowood Estates	5
51	Silverwood	12
52	Skyline Acrea	27
53	South Devon	68
54	Southwood Park	16
55	Springhill	1
56	Sunshine Gardens	10
57	The Hill	44
58	The Hugh John Flemming Forestry Center	3
59	University Of New Brunswick	15
60	Waterloo Row	9
61	Wesbett / Case	1
62	West Hills	5
63	Williams / Hawkins Area	17
64	Woodstock Road	41
65	Youngs Crossing	16

```
In [11]: crime_data.rename({'Platt': 'Plat'}, inplace=True)
crime_data.rename(index=str, columns={'Neighbourhood': 'Neighbour', 'Count': 'Crime_Count'}
crime_data
```

Out[11]:

	Neighbour	Crime_Count
0	Barkers Point	47
1	Brookside	54
2	Brookside Estates	9
3	Brookside Mini Home Park	5
4	College Hill	41
5	Colonial heights	9
6	Cotton Mill Creek	4
7	Diamond Street	1
8	Doak Road	1
9	Douglas	3
10	Downtown	127
11	Dun's Crossing	18
12	Forest Hill	12
13	Fredericton South	85
14	Fulton Heights	36
15	Garden Creek	13
16	Garden Place	4
17	Gilridge Estates	3
18	Golf Club	7
19	Grasse Circle	1
20	Greenwood Minihome Park	2
21	Hanwell North	8
22	Heron Springs	3
23	Highpoint Ridge	5
24	Kelly's Court Minihome Park	1
25	Knob Hill	4
26	Knowledge Park	1
27	Lian / Valcore	7
28	Lincoln	13
29	Lincoln Heights	14
30	Main Street	78
31	Marysville	39
32	McKnight	4
33	McLeod Hill	3
34	Monteith / Talisman	12
35	Montogomery / Prospect East	16
36	Nashwaaksis	25
37	Nethervue Minihome Park	1
38	North Devon	113
39	Northbrook Heights	10
40	Platt	198
41	Poet's Hill	4
42	Prospect	81
43	Rail Side	3
44	Regiment Creek	1
45	Royal Road	7
46	Saint Mary's First Nation	25

47	Saint Thomas University	1
48	Sandyville	9
49	Serenity Lane	2
50	Shadowood Estates	5
51	Silverwood	12
52	Skyline Acrea	27
53	South Devon	68
54	Southwood Park	16
55	Springhill	1
56	Sunshine Gardens	10
57	The Hill	44
58	The Hugh John Flemming Forestry Center	3
59	University Of New Brunswick	15
60	Waterloo Row	9
61	Wesbett / Case	1
62	West Hills	5
63	Williams / Hawkins Area	17
64	Woodstock Road	41
65	Youngs Crossing	16

In [12]: address = 'Fredericton, Canada'

```
geolocator = Nominatim()
location = geolocator.geocode(address)
latitude = location.latitude
longitude = location.longitude
print('The geographical coordinate of Fredericton, New Brunswick is {}, {}.'.format(latitude, longitude))

/home/jupyterlab/conda/lib/python3.6/site-packages/ipykernel_launcher.py:3: DeprecationWarning:
  This is separate from the ipykernel package so we can avoid doing imports until
```

The geographical coordinate of Fredericton, New Brunswick is 45.966425, -66.645813.

In [13]: world\_geo = r'world\_countries.json' # geojson file

```
fredericton_1_map = folium.Map(location=[45.97, -66.65], width=1000, height=750, zoom_start=12)

fredericton_1_map
```

Out[13]: <folium.folium.Map at 0x7f33f4ef9668>

In [14]: fredericton\_geo = r.json()

```
threshold_scale = np.linspace(crime_data['Crime_Count'].min(), crime_data['Crime_Count'].max(), 100)
threshold_scale = threshold_scale.tolist()
threshold_scale[-1] = threshold_scale[-1]+1
```

```
fredericton_1_map.choropleth(geo_data=fredericton_geo, data=crime_data,columns=['Neighbourhood'],  
key_on='feature.properties.Neighbourh', threshold_scale=threshold_scale,fill_color='red',  
line_opacity=0.1, legend_name='Fredericton Neighbourhoods')  
  
fredericton_1_map
```

```
Out[14]: <folium.folium.Map at 0x7f33f4ef9668>
```

## 2.2 Examine Crime Types

```
In [15]: crimetype_data = crime_df.groupby(['Crime_Type']).size().to_frame(name='Count').reset_index()  
crimetype_data
```

```
Out[15]:
```

	Crime_Type	Count
0		4
1	ARSON	5
2	ARSON BY NEG	1
3	ARSON-DAM.PROP.	4
4	B&E NON-RESIDNCE	51
5	B&E OTHER	58
6	B&E RESIDENCE	151
7	B&E STEAL FIREAR	3
8	MISCHIEF OBS USE	1
9	MISCHIEF TO PROP	246
10	MISCHIEF-DATA	2
11	MOTOR VEH THEFT	40
12	THEFT BIKE<\$5000	63
13	THEFT FROM MV < \$5000	356
14	THEFT FROM MV > \$5000	5
15	THEFT OTH <\$5000	458
16	THEFT OTH >\$5000	9
17	THEFT OVER \$5000	1
18	THEFT,BIKE>\$5000	2

```
In [16]: crimetype_data.describe()
```

```
Out[16]:
```

	Count
count	19.000000
mean	76.842105
std	133.196706
min	1.000000
25%	2.500000
50%	5.000000
75%	60.500000
max	458.000000

```
In [17]: crimepivot = crime_df.pivot_table(index='Neighbourhood', columns='Crime_Type', aggfunc=  
crimepivot
```

Out[17] :

	City	\
Crime_Type	ARSON	ARSON BY NEG
Neighbourhood		
Barkers Point	0	0
Brookside	0	0
Brookside Estates	0	0
Brookside Mini Home Park	0	0
College Hill	0	2
Colonial heights	0	0
Cotton Mill Creek	0	0
Diamond Street	0	0
Doak Road	0	0
Douglas	0	0
Downtown	0	1
Dun's Crossing	0	0
Forest Hill	0	0
Fredericton South	1	0
Fulton Heights	0	0
Garden Creek	0	0
Garden Place	0	0
Gilridge Estates	0	0
Golf Club	0	0
Grasse Circle	1	0
Greenwood Minihome Park	0	0
Hanwell North	0	0
Heron Springs	0	0
Highpoint Ridge	0	0
Kelly's Court Minihome Park	0	0
Knob Hill	0	0
Knowledge Park	1	0
Lian / Valcore	0	0
Lincoln	0	0
Lincoln Heights	0	0
Main Street	0	0
Marysville	0	1
McKnight	0	0
McLeod Hill	0	0
Monteith / Talisman	0	0
Montogomery / Prospect East	0	0
Nashwaaksis	0	0
Nethervue Minihome Park	0	0
North Devon	0	0
Northbrook Heights	0	0
Platt	0	0
Poet's Hill	0	0
Prospect	0	0
Rail Side	0	0
Regiment Creek	0	0

Royal Road	0	0	0
Saint Mary's First Nation	0	0	0
Saint Thomas University	0	0	0
Sandyville	0	0	0
Serenity Lane	0	0	0
Shadowood Estates	0	0	0
Silverwood	0	0	0
Skyline Acrea	0	1	0
South Devon	0	0	1
Southwood Park	0	0	0
Springhill	0	0	0
Sunshine Gardens	0	0	0
The Hill	0	0	0
The Hugh John Flemming Forestry Center	0	0	0
University Of New Brunswick	0	0	0
Waterloo Row	0	0	0
Wesbett / Case	1	0	0
West Hills	0	0	0
Williams / Hawkins Area	0	0	0
Woodstock Road	0	0	0
Youngs Crossing	0	0	0

\

Crime_Type	ARSON-DAM	PROP.	B&E	NON-RESIDNCE
Neighbourhood				
Barkers Point	0			2
Brookside	0			2
Brookside Estates	0			1
Brookside Mini Home Park	0			0
College Hill	0			0
Colonial heights	0			0
Cotton Mill Creek	0			0
Diamond Street	0			0
Doak Road	0			0
Douglas	0			0
Downtown	1			7
Dun's Crossing	0			0
Forest Hill	0			1
Fredericton South	0			6
Fulton Heights	0			1
Garden Creek	0			2
Garden Place	0			0
Gilridge Estates	0			0
Golf Club	0			0
Grasse Circle	0			0
Greenwood Minihome Park	0			0
Hanwell North	0			0
Heron Springs	0			0

Highpoint Ridge	0	0
Kelly's Court Minihome Park	0	0
Knob Hill	0	0
Knowledge Park	0	0
Lian / Valcore	0	0
Lincoln	0	2
Lincoln Heights	0	0
Main Street	1	2
Marysville	0	1
McKnight	0	0
McLeod Hill	0	0
Monteith / Talisman	0	2
Montgomery / Prospect East	0	0
Nashwaaksis	1	2
Nethervue Minihome Park	0	0
North Devon	0	5
Northbrook Heights	0	0
Platt	0	4
Poet's Hill	0	0
Prospect	0	1
Rail Side	0	0
Regiment Creek	0	0
Royal Road	0	3
Saint Mary's First Nation	0	0
Saint Thomas University	0	0
Sandyville	0	0
Serenity Lane	0	1
Shadowood Estates	0	0
Silverwood	0	0
Skyline Acrea	0	1
South Devon	0	0
Southwood Park	0	0
Springhill	0	0
Sunshine Gardens	0	0
The Hill	0	2
The Hugh John Flemming Forestry Center	0	1
University Of New Brunswick	0	0
Waterloo Row	0	0
Wesbett / Case	0	0
West Hills	0	0
Williams / Hawkins Area	0	0
Woodstock Road	0	2
Youngs Crossing	1	0

\

Crime_Type	B&E OTHER B&E RESIDENCE
Neighbourhood	
Barkers Point	

Brookside	0	0
Brookside Estates	1	0
Brookside Mini Home Park	0	0
College Hill	2	13
Colonial heights	0	3
Cotton Mill Creek	0	0
Diamond Street	0	0
Doak Road	0	0
Douglas	0	0
Downtown	0	3
Dun's Crossing	0	1
Forest Hill	0	0
Fredericton South	1	1
Fulton Heights	0	6
Garden Creek	1	1
Garden Place	0	0
Gilridge Estates	0	0
Golf Club	0	1
Grasse Circle	0	0
Greenwood Minihome Park	1	0
Hanwell North	1	2
Heron Springs	0	1
Highpoint Ridge	0	0
Kelly's Court Minihome Park	0	0
Knob Hill	0	1
Knowledge Park	0	0
Lian / Valcore	0	0
Lincoln	2	2
Lincoln Heights	1	1
Main Street	4	8
Marysville	2	5
McKnight	0	0
McLeod Hill	0	0
Monteith / Talisman	2	4
Montogomery / Prospect East	0	0
Nashwaaksis	0	3
Nethervue Minihome Park	0	0
North Devon	4	11
Northbrook Heights	0	2
Platt	10	18
Poet's Hill	0	1
Prospect	0	2
Rail Side	0	0
Regiment Creek	0	0
Royal Road	2	2
Saint Mary's First Nation	0	1
Saint Thomas University	0	0
Sandyville	2	2

Serenity Lane	1	0
Shadowood Estates	0	0
Silverwood	0	3
Skyline Acrea	1	2
South Devon	6	16
Southwood Park	0	2
Springhill	0	1
Sunshine Gardens	1	0
The Hill	1	12
The Hugh John Flemming Forestry Center	2	0
University Of New Brunswick	0	1
Waterloo Row	1	2
Wesbett / Case	0	0
West Hills	1	1
Williams / Hawkins Area	1	2
Woodstock Road	0	5
Youngs Crossing	0	2

Crime_Type	B&E	STEAL	FIREAR	MISCHIEF	OBS	USE
Neighbourhood						\
Barkers Point	1	0				
Brookside	0	0				
Brookside Estates	0	0				
Brookside Mini Home Park	1	0				
College Hill	0	0				
Colonial heights	0	0				
Cotton Mill Creek	0	0				
Diamond Street	0	0				
Doak Road	0	0				
Douglas	0	0				
Downtown	0	0				
Dun's Crossing	0	0				
Forest Hill	0	0				
Fredericton South	0	0				
Fulton Heights	0	0				
Garden Creek	0	0				
Garden Place	0	0				
Gilridge Estates	0	0				
Golf Club	0	0				
Grasse Circle	0	0				
Greenwood Minihome Park	0	0				
Hanwell North	0	0				
Heron Springs	0	0				
Highpoint Ridge	0	0				
Kelly's Court Minihome Park	0	0				
Knob Hill	0	0				
Knowledge Park	0	0				

Lian / Valcore	0	0
Lincoln	0	0
Lincoln Heights	0	0
Main Street	0	1
Marysville	0	0
McKnight	0	0
McLeod Hill	0	0
Monteith / Talisman	0	0
Montgomery / Prospect East	0	0
Nashwaaksis	0	0
Nethervue Minihome Park	0	0
North Devon	0	0
Northbrook Heights	0	0
Platt	0	0
Poet's Hill	0	0
Prospect	0	0
Rail Side	0	0
Regiment Creek	0	0
Royal Road	0	0
Saint Mary's First Nation	0	0
Saint Thomas University	0	0
Sandyville	0	0
Serenity Lane	0	0
Shadowood Estates	0	0
Silverwood	0	0
Skyline Acrea	0	0
South Devon	0	0
Southwood Park	0	0
Springhill	0	0
Sunshine Gardens	0	0
The Hill	1	0
The Hugh John Flemming Forestry Center	0	0
University Of New Brunswick	0	0
Waterloo Row	0	0
Wesbett / Case	0	0
West Hills	0	0
Williams / Hawkins Area	0	0
Woodstock Road	0	0
Youngs Crossing	0	0

Crime_Type	MISCHIEF TO PROP MISCHIEF -DATA	
Neighbourhood		
Barkers Point	7	0
Brookside	0	0
Brookside Estates	1	0
Brookside Mini Home Park	3	0
College Hill	4	0

Colonial heights	0	0
Cotton Mill Creek	3	0
Diamond Street	0	0
Doak Road	0	0
Douglas	0	0
Downtown	29	1
Dun's Crossing	5	0
Forest Hill	0	0
Fredericton South	13	0
Fulton Heights	8	0
Garden Creek	0	0
Garden Place	0	0
Gilridge Estates	0	0
Golf Club	0	0
Grasse Circle	0	0
Greenwood Minihome Park	0	0
Hanwell North	1	0
Heron Springs	0	0
Highpoint Ridge	0	0
Kelly's Court Minihome Park	1	0
Knob Hill	1	0
Knowledge Park	0	0
Lian / Valcore	0	1
Lincoln	1	0
Lincoln Heights	1	0
Main Street	12	0
Marysville	8	0
McKnight	1	0
McLeod Hill	0	0
Monteith / Talisman	0	0
Montogomery / Prospect East	2	0
Nashwaaksis	5	0
Nethervue Minihome Park	0	0
North Devon	40	0
Northbrook Heights	2	0
Platt	31	0
Poet's Hill	1	0
Prospect	16	0
Rail Side	0	0
Regiment Creek	0	0
Royal Road	0	0
Saint Mary's First Nation	6	0
Saint Thomas University	0	0
Sandyville	1	0
Serenity Lane	0	0
Shadowood Estates	2	0
Silverwood	2	0
Skyline Acrea	6	0

South Devon	8	0
Southwood Park	1	0
Springhill	0	0
Sunshine Gardens	1	0
The Hill	7	0
The Hugh John Flemming Forestry Center	0	0
University Of New Brunswick	0	0
Waterloo Row	1	0
Wesbett / Case	0	0
West Hills	2	0
Williams / Hawkins Area	7	0
Woodstock Road	2	0
Youngs Crossing	4	0

Crime_Type	MOTOR	VEH	THEFT	THEFT	BIKE<\$5000
Neighbourhood					\
Barkers Point	2				2
Brookside	2				0
Brookside Estates	1				0
Brookside Mini Home Park	1				0
College Hill	0				2
Colonial heights	0				0
Cotton Mill Creek	1				0
Diamond Street	0				0
Doak Road	0				0
Douglas	2				0
Downtown	4				8
Dun's Crossing	1				0
Forest Hill	0				0
Fredericton South	1				2
Fulton Heights	0				3
Garden Creek	0				0
Garden Place	0				1
Gilridge Estates	1				0
Golf Club	1				0
Grasse Circle	0				0
Greenwood Minihome Park	1				0
Hanwell North	0				0
Heron Springs	0				0
Highpoint Ridge	0				0
Kelly's Court Minihome Park	0				0
Knob Hill	1				0
Knowledge Park	0				0
Lian / Valcore	0				0
Lincoln	0				1
Lincoln Heights	0				0
Main Street	2				3

Marysville	1	1
McKnight	0	0
McLeod Hill	1	0
Monteith / Talisman	0	1
Montgomery / Prospect East	0	0
Nashwaaksis	1	0
Nethervue Minihome Park	0	0
North Devon	0	6
Northbrook Heights	1	0
Platt	3	21
Poet's Hill	0	0
Prospect	0	0
Rail Side	1	0
Regiment Creek	0	0
Royal Road	0	0
Saint Mary's First Nation	3	1
Saint Thomas University	0	0
Sandyville	0	0
Serenity Lane	0	0
Shadowood Estates	1	0
Silverwood	1	0
Skyline Acrea	0	0
South Devon	0	5
Southwood Park	1	1
Springhill	0	0
Sunshine Gardens	0	0
The Hill	0	0
The Hugh John Flemming Forestry Center	0	0
University Of New Brunswick	0	2
Waterloo Row	0	1
Wesbett / Case	0	0
West Hills	0	0
Williams / Hawkins Area	0	0
Woodstock Road	4	2
Youngs Crossing	1	0

Crime_Type	THEFT FROM MV < \$5000
Neighbourhood	
Barkers Point	8
Brookside	0
Brookside Estates	3
Brookside Mini Home Park	0
College Hill	10
Colonial heights	6
Cotton Mill Creek	0
Diamond Street	1
Doak Road	0

Douglas	1
Downtown	21
Dun's Crossing	9
Forest Hill	8
Fredericton South	20
Fulton Heights	12
Garden Creek	1
Garden Place	3
Gilridge Estates	1
Golf Club	5
Grasse Circle	0
Greenwood Minihome Park	0
Hanwell North	3
Heron Springs	2
Highpoint Ridge	4
Kelly's Court Minihome Park	0
Knob Hill	1
Knowledge Park	0
Lian / Valcore	1
Lincoln	1
Lincoln Heights	11
Main Street	10
Marysville	10
McKnight	1
McLeod Hill	2
Monteith / Talisman	3
Montgomery / Prospect East	3
Nashwaaksis	9
Nethervue Minihome Park	1
North Devon	17
Northbrook Heights	5
Platt	40
Poet's Hill	2
Prospect	11
Rail Side	2
Regiment Creek	0
Royal Road	0
Saint Mary's First Nation	1
Saint Thomas University	1
Sandyville	3
Serenity Lane	0
Shadowood Estates	2
Silverwood	2
Skyline Acrea	13
South Devon	22
Southwood Park	7
Springhill	0
Sunshine Gardens	7

The Hill	11
The Hugh John Flemming Forestry Center	0
University Of New Brunswick	4
Waterloo Row	3
Wesbett / Case	0
West Hills	0
Williams / Hawkins Area	6
Woodstock Road	20
Youngs Crossing	6

Crime_Type	THEFT FROM MV > \$5000 THEFT OTH <\$5000	
Neighbourhood		
Barkers Point	0	11
Brookside	0	50
Brookside Estates	0	2
Brookside Mini Home Park	0	0
College Hill	0	8
Colonial heights	0	0
Cotton Mill Creek	0	0
Diamond Street	0	0
Doak Road	0	0
Douglas	0	0
Downtown	0	49
Dun's Crossing	0	2
Forest Hill	0	3
Fredericton South	1	35
Fulton Heights	0	6
Garden Creek	0	7
Garden Place	0	0
Gilridge Estates	0	1
Golf Club	0	0
Grasse Circle	0	0
Greenwood Minihome Park	0	0
Hanwell North	0	1
Heron Springs	0	0
Highpoint Ridge	0	1
Kelly's Court Minihome Park	0	0
Knob Hill	0	0
Knowledge Park	0	0
Lian / Valcore	0	5
Lincoln	0	4
Lincoln Heights	0	0
Main Street	0	33
Marysville	0	10
McKnight	0	2
McLeod Hill	0	0
Monteith / Talisman	0	0

Montgomery / Prospect East	0	11
Nashwaaksis	1	3
Nethervue Minihome Park	0	0
North Devon	0	30
Northbrook Heights	0	0
Platt	0	71
Poet's Hill	0	0
Prospect	2	48
Rail Side	0	0
Regiment Creek	0	1
Royal Road	0	0
Saint Mary's First Nation	0	13
Saint Thomas University	0	0
Sandyville	0	1
Serenity Lane	0	0
Shadowood Estates	0	0
Silverwood	0	4
Skyline Acrea	0	3
South Devon	0	10
Southwood Park	0	4
Springhill	0	0
Sunshine Gardens	0	1
The Hill	0	10
The Hugh John Flemming Forestry Center	0	0
University Of New Brunswick	0	8
Waterloo Row	0	1
Wesbett / Case	0	0
West Hills	0	1
Williams / Hawkins Area	0	1
Woodstock Road	1	5
Youngs Crossing	0	2

Crime_Type	THEFT OTH >\$5000	THEFT OVER \$5000
Neighbourhood		
Barkers Point	0	0
Brookside	0	0
Brookside Estates	0	0
Brookside Mini Home Park	0	0
College Hill	0	0
Colonial heights	0	0
Cotton Mill Creek	0	0
Diamond Street	0	0
Doak Road	1	0
Douglas	0	0
Downtown	1	1
Dun's Crossing	0	0
Forest Hill	0	0

Fredericton South	4	0
Fulton Heights	0	0
Garden Creek	1	0
Garden Place	0	0
Gilridge Estates	0	0
Golf Club	0	0
Grasse Circle	0	0
Greenwood Minihome Park	0	0
Hanwell North	0	0
Heron Springs	0	0
Highpoint Ridge	0	0
Kelly's Court Minihome Park	0	0
Knob Hill	0	0
Knowledge Park	0	0
Lian / Valcore	0	0
Lincoln	0	0
Lincoln Heights	0	0
Main Street	2	0
Marysville	0	0
McKnight	0	0
McLeod Hill	0	0
Monteith / Talisman	0	0
Montgomery / Prospect East	0	0
Nashwaaksis	0	0
Nethervue Minihome Park	0	0
North Devon	0	0
Northbrook Heights	0	0
Platt	0	0
Poet's Hill	0	0
Prospect	0	0
Rail Side	0	0
Regiment Creek	0	0
Royal Road	0	0
Saint Mary's First Nation	0	0
Saint Thomas University	0	0
Sandyville	0	0
Serenity Lane	0	0
Shadowood Estates	0	0
Silverwood	0	0
Skyline Acrea	0	0
South Devon	0	0
Southwood Park	0	0
Springhill	0	0
Sunshine Gardens	0	0
The Hill	0	0
The Hugh John Flemming Forestry Center	0	0
University Of New Brunswick	0	0
Waterloo Row	0	0

Wesbett / Case	0	0
West Hills	0	0
Williams / Hawkins Area	0	0
Woodstock Road	0	0
Youngs Crossing	0	0

Crime_Type	THEFT , BIKE>\$5000	ARSON	Crime_Code \
Neighbourhood			
Barkers Point	0	0	0
Brookside	0	0	0
Brookside Estates	0	0	0
Brookside Mini Home Park	0	0	0
College Hill	0	0	2
Colonial heights	0	0	0
Cotton Mill Creek	0	0	0
Diamond Street	0	0	0
Doak Road	0	0	0
Douglas	0	0	0
Downtown	1	0	1
Dun's Crossing	0	0	0
Forest Hill	0	0	0
Fredericton South	0	1	0
Fulton Heights	0	0	0
Garden Creek	0	0	0
Garden Place	0	0	0
Gilridge Estates	0	0	0
Golf Club	0	0	0
Grasse Circle	0	1	0
Greenwood Minihome Park	0	0	0
Hanwell North	0	0	0
Heron Springs	0	0	0
Highpoint Ridge	0	0	0
Kelly's Court Minihome Park	0	0	0
Knob Hill	0	0	0
Knowledge Park	0	1	0
Lian / Valcore	0	0	0
Lincoln	0	0	0
Lincoln Heights	0	0	0
Main Street	0	0	0
Marysville	0	0	1
McKnight	0	0	0
McLeod Hill	0	0	0
Monteith / Talisman	0	0	0
Montgomery / Prospect East	0	0	0
Nashwaaksis	0	0	0
Nethervue Minihome Park	0	0	0
North Devon	0	0	0

Northbrook Heights	0	0	0
Platt	0	0	0
Poet's Hill	0	0	0
Prospect	1	0	0
Rail Side	0	0	0
Regiment Creek	0	0	0
Royal Road	0	0	0
Saint Mary's First Nation	0	0	0
Saint Thomas University	0	0	0
Sandyville	0	0	0
Serenity Lane	0	0	0
Shadowood Estates	0	0	0
Silverwood	0	0	0
Skyline Acrea	0	0	1
South Devon	0	0	0
Southwood Park	0	0	0
Springhill	0	0	0
Sunshine Gardens	0	0	0
The Hill	0	0	0
The Hugh John Flemming Forestry Center	0	0	0
University Of New Brunswick	0	0	0
Waterloo Row	0	0	0
Wesbett / Case	0	1	0
West Hills	0	0	0
Williams / Hawkins Area	0	0	0
Woodstock Road	0	0	0
Youngs Crossing	0	0	0

Crime_Type	ARSON BY NEG ARSON-DAM.PROP.		
Neighbourhood			
Barkers Point	0	0	0
Brookside	0	0	0
Brookside Estates	0	0	0
Brookside Mini Home Park	0	0	0
College Hill	0	0	0
Colonial heights	0	0	0
Cotton Mill Creek	0	0	0
Diamond Street	0	0	0
Doak Road	0	0	0
Douglas	0	0	0
Downtown	0	1	0
Dun's Crossing	0	0	0
Forest Hill	0	0	0
Fredericton South	0	0	0
Fulton Heights	0	0	0
Garden Creek	0	0	0
Garden Place	0	0	0

Gilridge Estates	0	0
Golf Club	0	0
Grasse Circle	0	0
Greenwood Minihome Park	0	0
Hanwell North	0	0
Heron Springs	0	0
Highpoint Ridge	0	0
Kelly's Court Minihome Park	0	0
Knob Hill	0	0
Knowledge Park	0	0
Lian / Valcore	0	0
Lincoln	0	0
Lincoln Heights	0	0
Main Street	0	1
Marysville	0	0
McKnight	0	0
McLeod Hill	0	0
Monteith / Talisman	0	0
Montgomery / Prospect East	0	0
Nashwaaksis	0	1
Nethervue Minihome Park	0	0
North Devon	0	0
Northbrook Heights	0	0
Platt	0	0
Poet's Hill	0	0
Prospect	0	0
Rail Side	0	0
Regiment Creek	0	0
Royal Road	0	0
Saint Mary's First Nation	0	0
Saint Thomas University	0	0
Sandyville	0	0
Serenity Lane	0	0
Shadowood Estates	0	0
Silverwood	0	0
Skyline Acrea	0	0
South Devon	1	0
Southwood Park	0	0
Springhill	0	0
Sunshine Gardens	0	0
The Hill	0	0
The Hugh John Flemming Forestry Center	0	0
University Of New Brunswick	0	0
Waterloo Row	0	0
Wesbett / Case	0	0
West Hills	0	0
Williams / Hawkins Area	0	0
Woodstock Road	0	0

	0	1
Crime_Type	B&E	NON-RESIDNCE
Neighbourhood		\
Barkers Point	2	7
Brookside	2	0
Brookside Estates	1	1
Brookside Mini Home Park	0	0
College Hill	0	2
Colonial heights	0	0
Cotton Mill Creek	0	0
Diamond Street	0	0
Doak Road	0	0
Douglas	0	0
Downtown	7	0
Dun's Crossing	0	0
Forest Hill	1	0
Fredericton South	6	1
Fulton Heights	1	0
Garden Creek	2	1
Garden Place	0	0
Gilridge Estates	0	0
Golf Club	0	0
Grasse Circle	0	0
Greenwood Minihome Park	0	1
Hanwell North	0	1
Heron Springs	0	0
Highpoint Ridge	0	0
Kelly's Court Minihome Park	0	0
Knob Hill	0	0
Knowledge Park	0	0
Lian / Valcore	0	0
Lincoln	2	2
Lincoln Heights	0	1
Main Street	2	4
Marysville	1	2
McKnight	0	0
McLeod Hill	0	0
Monteith / Talisman	2	2
Montgomery / Prospect East	0	0
Nashwaaksis	2	0
Nethervue Minihome Park	0	0
North Devon	5	4
Northbrook Heights	0	0
Platt	4	10
Poet's Hill	0	0
Prospect	1	0

Rail Side	0	0
Regiment Creek	0	0
Royal Road	3	2
Saint Mary's First Nation	0	0
Saint Thomas University	0	0
Sandyville	0	2
Serenity Lane	1	1
Shadowood Estates	0	0
Silverwood	0	0
Skyline Acrea	1	1
South Devon	0	6
Southwood Park	0	0
Springhill	0	0
Sunshine Gardens	0	1
The Hill	2	1
The Hugh John Flemming Forestry Center	1	2
University Of New Brunswick	0	0
Waterloo Row	0	1
Wesbett / Case	0	0
West Hills	0	1
Williams / Hawkins Area	0	1
Woodstock Road	2	0
Youngs Crossing	0	0

Crime_Type	B&E RESIDENCE	B&E STEAL FIREAR
Neighbourhood		
Barkers Point	7	1
Brookside	0	0
Brookside Estates	0	0
Brookside Mini Home Park	0	1
College Hill	13	0
Colonial heights	3	0
Cotton Mill Creek	0	0
Diamond Street	0	0
Doak Road	0	0
Douglas	0	0
Downtown	3	0
Dun's Crossing	1	0
Forest Hill	0	0
Fredericton South	1	0
Fulton Heights	6	0
Garden Creek	1	0
Garden Place	0	0
Gilridge Estates	0	0
Golf Club	1	0
Grasse Circle	0	0
Greenwood Minihome Park	0	0

Hanwell North	2	0
Heron Springs	1	0
Highpoint Ridge	0	0
Kelly's Court Minihome Park	0	0
Knob Hill	1	0
Knowledge Park	0	0
Lian / Valcore	0	0
Lincoln	2	0
Lincoln Heights	1	0
Main Street	8	0
Marysville	5	0
McKnight	0	0
McLeod Hill	0	0
Monteith / Talisman	4	0
Montgomery / Prospect East	0	0
Nashwaaksis	3	0
Nethervue Minihome Park	0	0
North Devon	11	0
Northbrook Heights	2	0
Platt	18	0
Poet's Hill	1	0
Prospect	2	0
Rail Side	0	0
Regiment Creek	0	0
Royal Road	2	0
Saint Mary's First Nation	1	0
Saint Thomas University	0	0
Sandyville	2	0
Serenity Lane	0	0
Shadowood Estates	0	0
Silverwood	3	0
Skyline Acrea	2	0
South Devon	16	0
Southwood Park	2	0
Springhill	1	0
Sunshine Gardens	0	0
The Hill	12	1
The Hugh John Flemming Forestry Center	0	0
University Of New Brunswick	1	0
Waterloo Row	2	0
Wesbett / Case	0	0
West Hills	1	0
Williams / Hawkins Area	2	0
Woodstock Road	5	0
Youngs Crossing	2	0

Crime\_Type

MISCHIEF OBS USE MISCHIEF TO PROP

Neighbourhood		
Barkers Point	0	7
Brookside	0	0
Brookside Estates	0	1
Brookside Mini Home Park	0	3
College Hill	0	4
Colonial heights	0	0
Cotton Mill Creek	0	3
Diamond Street	0	0
Doak Road	0	0
Douglas	0	0
Downtown	0	29
Dun's Crossing	0	5
Forest Hill	0	0
Fredericton South	0	13
Fulton Heights	0	8
Garden Creek	0	0
Garden Place	0	0
Gilridge Estates	0	0
Golf Club	0	0
Grasse Circle	0	0
Greenwood Minihome Park	0	0
Hanwell North	0	1
Heron Springs	0	0
Highpoint Ridge	0	0
Kelly's Court Minihome Park	0	1
Knob Hill	0	1
Knowledge Park	0	0
Lian / Valcore	0	0
Lincoln	0	1
Lincoln Heights	0	1
Main Street	1	12
Marysville	0	8
McKnight	0	1
McLeod Hill	0	0
Monteith / Talisman	0	0
Montgomery / Prospect East	0	2
Nashwaaksis	0	5
Nethervue Minihome Park	0	0
North Devon	0	40
Northbrook Heights	0	2
Platt	0	31
Poet's Hill	0	1
Prospect	0	16
Rail Side	0	0
Regiment Creek	0	0
Royal Road	0	0
Saint Mary's First Nation	0	6

Saint Thomas University	0	0
Sandyville	0	1
Serenity Lane	0	0
Shadowood Estates	0	2
Silverwood	0	2
Skyline Acrea	0	6
South Devon	0	8
Southwood Park	0	1
Springhill	0	0
Sunshine Gardens	0	1
The Hill	0	7
The Hugh John Flemming Forestry Center	0	0
University Of New Brunswick	0	0
Waterloo Row	0	1
Wesbett / Case	0	0
West Hills	0	2
Williams / Hawkins Area	0	7
Woodstock Road	0	2
Youngs Crossing	0	4

Crime_Type	MISCHIEF-DATA MOTOR VEH THEFT	
Neighbourhood		
Barkers Point	0	2
Brookside	0	2
Brookside Estates	0	1
Brookside Mini Home Park	0	1
College Hill	0	0
Colonial heights	0	0
Cotton Mill Creek	0	1
Diamond Street	0	0
Doak Road	0	0
Douglas	0	2
Downtown	1	4
Dun's Crossing	0	1
Forest Hill	0	0
Fredericton South	0	1
Fulton Heights	0	0
Garden Creek	0	0
Garden Place	0	0
Gilridge Estates	0	1
Golf Club	0	1
Grasse Circle	0	0
Greenwood Minihome Park	0	1
Hanwell North	0	0
Heron Springs	0	0
Highpoint Ridge	0	0
Kelly's Court Minihome Park	0	0

Knob Hill	0	1
Knowledge Park	0	0
Lian / Valcore	1	0
Lincoln	0	0
Lincoln Heights	0	0
Main Street	0	2
Marysville	0	1
McKnight	0	0
McLeod Hill	0	1
Monteith / Talisman	0	0
Montogomery / Prospect East	0	0
Nashwaaksis	0	1
Nethervue Minihome Park	0	0
North Devon	0	0
Northbrook Heights	0	1
Platt	0	3
Poet's Hill	0	0
Prospect	0	0
Rail Side	0	1
Regiment Creek	0	0
Royal Road	0	0
Saint Mary's First Nation	0	3
Saint Thomas University	0	0
Sandyville	0	0
Serenity Lane	0	0
Shadowood Estates	0	1
Silverwood	0	1
Skyline Acrea	0	0
South Devon	0	0
Southwood Park	0	1
Springhill	0	0
Sunshine Gardens	0	0
The Hill	0	0
The Hugh John Flemming Forestry Center	0	0
University Of New Brunswick	0	0
Waterloo Row	0	0
Wesbett / Case	0	0
West Hills	0	0
Williams / Hawkins Area	0	0
Woodstock Road	0	4
Youngs Crossing	0	1

Crime_Type	THEFT BIKE<\$5000 THEFT FROM MV < \$5000	
Neighbourhood		
Barkers Point	2	8
Brookside	0	0
Brookside Estates	0	3

Brookside Mini Home Park	0	0
College Hill	2	10
Colonial heights	0	6
Cotton Mill Creek	0	0
Diamond Street	0	1
Doak Road	0	0
Douglas	0	1
Downtown	8	21
Dun's Crossing	0	9
Forest Hill	0	8
Fredericton South	2	20
Fulton Heights	3	12
Garden Creek	0	1
Garden Place	1	3
Gilridge Estates	0	1
Golf Club	0	5
Grasse Circle	0	0
Greenwood Minihome Park	0	0
Hanwell North	0	3
Heron Springs	0	2
Highpoint Ridge	0	4
Kelly's Court Minihome Park	0	0
Knob Hill	0	1
Knowledge Park	0	0
Lian / Valcore	0	1
Lincoln	1	1
Lincoln Heights	0	11
Main Street	3	10
Marysville	1	10
McKnight	0	1
McLeod Hill	0	2
Monteith / Talisman	1	3
Montogomery / Prospect East	0	3
Nashwaaksis	0	9
Nethervue Minihome Park	0	1
North Devon	6	17
Northbrook Heights	0	5
Platt	21	40
Poet's Hill	0	2
Prospect	0	11
Rail Side	0	2
Regiment Creek	0	0
Royal Road	0	0
Saint Mary's First Nation	1	1
Saint Thomas University	0	1
Sandyville	0	3
Serenity Lane	0	0
Shadowood Estates	0	2

Silverwood	0	2
Skyline Acrea	0	13
South Devon	5	22
Southwood Park	1	7
Springhill	0	0
Sunshine Gardens	0	7
The Hill	0	11
The Hugh John Flemming Forestry Center	0	0
University Of New Brunswick	2	4
Waterloo Row	1	3
Wesbett / Case	0	0
West Hills	0	0
Williams / Hawkins Area	0	6
Woodstock Road	2	20
Youngs Crossing	0	6

Crime_Type	THEFT FROM MV > \$5000 THEFT OTH <\$5000	
Neighbourhood		
Barkers Point	0	11
Brookside	0	50
Brookside Estates	0	2
Brookside Mini Home Park	0	0
College Hill	0	8
Colonial heights	0	0
Cotton Mill Creek	0	0
Diamond Street	0	0
Doak Road	0	0
Douglas	0	0
Downtown	0	49
Dun's Crossing	0	2
Forest Hill	0	3
Fredericton South	1	35
Fulton Heights	0	6
Garden Creek	0	7
Garden Place	0	0
Gilridge Estates	0	1
Golf Club	0	0
Grasse Circle	0	0
Greenwood Minihome Park	0	0
Hanwell North	0	1
Heron Springs	0	0
Highpoint Ridge	0	1
Kelly's Court Minihome Park	0	0
Knob Hill	0	0
Knowledge Park	0	0
Lian / Valcore	0	5
Lincoln	0	4

Lincoln Heights	0	0
Main Street	0	33
Marysville	0	10
McKnight	0	2
McLeod Hill	0	0
Monteith / Talisman	0	0
Montgomery / Prospect East	0	11
Nashwaaksis	1	3
Nethervue Minihome Park	0	0
North Devon	0	30
Northbrook Heights	0	0
Platt	0	71
Poet's Hill	0	0
Prospect	2	48
Rail Side	0	0
Regiment Creek	0	1
Royal Road	0	0
Saint Mary's First Nation	0	13
Saint Thomas University	0	0
Sandyville	0	1
Serenity Lane	0	0
Shadowood Estates	0	0
Silverwood	0	4
Skyline Acrea	0	3
South Devon	0	10
Southwood Park	0	4
Springhill	0	0
Sunshine Gardens	0	1
The Hill	0	10
The Hugh John Flemming Forestry Center	0	0
University Of New Brunswick	0	8
Waterloo Row	0	1
Wesbett / Case	0	0
West Hills	0	1
Williams / Hawkins Area	0	1
Woodstock Road	1	5
Youngs Crossing	0	2

Crime_Type	THEFT OTH >\$5000	THEFT OVER \$5000
Neighbourhood		
Barkers Point	0	0
Brookside	0	0
Brookside Estates	0	0
Brookside Mini Home Park	0	0
College Hill	0	0
Colonial heights	0	0
Cotton Mill Creek	0	0

Diamond Street	0	0
Doak Road	1	0
Douglas	0	0
Downtown	1	1
Dun's Crossing	0	0
Forest Hill	0	0
Fredericton South	4	0
Fulton Heights	0	0
Garden Creek	1	0
Garden Place	0	0
Gilridge Estates	0	0
Golf Club	0	0
Grasse Circle	0	0
Greenwood Minihome Park	0	0
Hanwell North	0	0
Heron Springs	0	0
Highpoint Ridge	0	0
Kelly's Court Minihome Park	0	0
Knob Hill	0	0
Knowledge Park	0	0
Lian / Valcore	0	0
Lincoln	0	0
Lincoln Heights	0	0
Main Street	2	0
Marysville	0	0
McKnight	0	0
McLeod Hill	0	0
Monteith / Talisman	0	0
Montogomery / Prospect East	0	0
Nashwaaksis	0	0
Nethervue Minihome Park	0	0
North Devon	0	0
Northbrook Heights	0	0
Platt	0	0
Poet's Hill	0	0
Prospect	0	0
Rail Side	0	0
Regiment Creek	0	0
Royal Road	0	0
Saint Mary's First Nation	0	0
Saint Thomas University	0	0
Sandyville	0	0
Serenity Lane	0	0
Shadowood Estates	0	0
Silverwood	0	0
Skyline Acrea	0	0
South Devon	0	0
Southwood Park	0	0

Springhill	0	0
Sunshine Gardens	0	0
The Hill	0	0
The Hugh John Flemming Forestry Center	0	0
University Of New Brunswick	0	0
Waterloo Row	0	0
Wesbett / Case	0	0
West Hills	0	0
Williams / Hawkins Area	0	0
Woodstock Road	0	0
Youngs Crossing	0	0

Crime_Type	FID	\
	THEFT, BIKE>\$5000	ARSON
Neighbourhood		
Barkers Point	0	0
Brookside	0	0
Brookside Estates	0	0
Brookside Mini Home Park	0	0
College Hill	0	0
Colonial heights	0	0
Cotton Mill Creek	0	0
Diamond Street	0	0
Doak Road	0	0
Douglas	0	0
Downtown	1	0
Dun's Crossing	0	0
Forest Hill	0	0
Fredericton South	0	1
Fulton Heights	0	0
Garden Creek	0	0
Garden Place	0	0
Gilridge Estates	0	0
Golf Club	0	0
Grasse Circle	0	1
Greenwood Minihome Park	0	0
Hanwell North	0	0
Heron Springs	0	0
Highpoint Ridge	0	0
Kelly's Court Minihome Park	0	0
Knob Hill	0	0
Knowledge Park	0	1
Lian / Valcore	0	0
Lincoln	0	0
Lincoln Heights	0	0
Main Street	0	0
Marysville	0	0
McKnight	0	0

McLeod Hill	0	0	0
Monteith / Talisman	0	0	0
Montgomery / Prospect East	0	0	0
Nashwaaksis	0	0	0
Nethervue Minihome Park	0	0	0
North Devon	0	0	0
Northbrook Heights	0	0	0
Platt	0	0	0
Poet's Hill	0	0	0
Prospect	1	0	0
Rail Side	0	0	0
Regiment Creek	0	0	0
Royal Road	0	0	0
Saint Mary's First Nation	0	0	0
Saint Thomas University	0	0	0
Sandyville	0	0	0
Serenity Lane	0	0	0
Shadowood Estates	0	0	0
Silverwood	0	0	0
Skyline Acrea	0	0	1
South Devon	0	0	0
Southwood Park	0	0	0
Springhill	0	0	0
Sunshine Gardens	0	0	0
The Hill	0	0	0
The Hugh John Flemming Forestry Center	0	0	0
University Of New Brunswick	0	0	0
Waterloo Row	0	0	0
Wesbett / Case	0	1	0
West Hills	0	0	0
Williams / Hawkins Area	0	0	0
Woodstock Road	0	0	0
Youngs Crossing	0	0	0

Crime_Type	ARSON BY NEG ARSON-DAM.PROP.		
Neighbourhood			
Barkers Point	0	0	0
Brookside	0	0	0
Brookside Estates	0	0	0
Brookside Mini Home Park	0	0	0
College Hill	0	0	0
Colonial heights	0	0	0
Cotton Mill Creek	0	0	0
Diamond Street	0	0	0
Doak Road	0	0	0
Douglas	0	0	0
Downtown	0	1	1

Dun's Crossing	0	0
Forest Hill	0	0
Fredericton South	0	0
Fulton Heights	0	0
Garden Creek	0	0
Garden Place	0	0
Gilridge Estates	0	0
Golf Club	0	0
Grasse Circle	0	0
Greenwood Minihome Park	0	0
Hanwell North	0	0
Heron Springs	0	0
Highpoint Ridge	0	0
Kelly's Court Minihome Park	0	0
Knob Hill	0	0
Knowledge Park	0	0
Lian / Valcore	0	0
Lincoln	0	0
Lincoln Heights	0	0
Main Street	0	1
Marysville	0	0
McKnight	0	0
McLeod Hill	0	0
Monteith / Talisman	0	0
Montogomery / Prospect East	0	0
Nashwaaksis	0	1
Nethervue Minihome Park	0	0
North Devon	0	0
Northbrook Heights	0	0
Platt	0	0
Poet's Hill	0	0
Prospect	0	0
Rail Side	0	0
Regiment Creek	0	0
Royal Road	0	0
Saint Mary's First Nation	0	0
Saint Thomas University	0	0
Sandyville	0	0
Serenity Lane	0	0
Shadowood Estates	0	0
Silverwood	0	0
Skyline Acrea	0	0
South Devon	1	0
Southwood Park	0	0
Springhill	0	0
Sunshine Gardens	0	0
The Hill	0	0
The Hugh John Flemming Forestry Center	0	0

University Of New Brunswick	0	0
Waterloo Row	0	0
Wesbett / Case	0	0
West Hills	0	0
Williams / Hawkins Area	0	0
Woodstock Road	0	0
Youngs Crossing	0	1

Crime_Type	B&E	NON-RESIDNCE	B&E	OTHER
Neighbourhood				
Barkers Point	2		7	
Brookside	2		0	
Brookside Estates	1		1	
Brookside Mini Home Park	0		0	
College Hill	0		2	
Colonial heights	0		0	
Cotton Mill Creek	0		0	
Diamond Street	0		0	
Doak Road	0		0	
Douglas	0		0	
Downtown	7		0	
Dun's Crossing	0		0	
Forest Hill	1		0	
Fredericton South	6		1	
Fulton Heights	1		0	
Garden Creek	2		1	
Garden Place	0		0	
Gilridge Estates	0		0	
Golf Club	0		0	
Grasse Circle	0		0	
Greenwood Minihome Park	0		1	
Hanwell North	0		1	
Heron Springs	0		0	
Highpoint Ridge	0		0	
Kelly's Court Minihome Park	0		0	
Knob Hill	0		0	
Knowledge Park	0		0	
Lian / Valcore	0		0	
Lincoln	2		2	
Lincoln Heights	0		1	
Main Street	2		4	
Marysville	1		2	
McKnight	0		0	
McLeod Hill	0		0	
Monteith / Talisman	2		2	
Montogomery / Prospect East	0		0	
Nashwaaksis	2		0	

Nethervue Minihome Park	0	0
North Devon	5	4
Northbrook Heights	0	0
Platt	4	10
Poet's Hill	0	0
Prospect	1	0
Rail Side	0	0
Regiment Creek	0	0
Royal Road	3	2
Saint Mary's First Nation	0	0
Saint Thomas University	0	0
Sandyville	0	2
Serenity Lane	1	1
Shadowood Estates	0	0
Silverwood	0	0
Skyline Acrea	1	1
South Devon	0	6
Southwood Park	0	0
Springhill	0	0
Sunshine Gardens	0	1
The Hill	2	1
The Hugh John Flemming Forestry Center	1	2
University Of New Brunswick	0	0
Waterloo Row	0	1
Wesbett / Case	0	0
West Hills	0	1
Williams / Hawkins Area	0	1
Woodstock Road	2	0
Youngs Crossing	0	0

Crime_Type	B&E RESIDENCE	B&E STEAL FIREAR
Neighbourhood		
Barkers Point	7	1
Brookside	0	0
Brookside Estates	0	0
Brookside Mini Home Park	0	1
College Hill	13	0
Colonial heights	3	0
Cotton Mill Creek	0	0
Diamond Street	0	0
Doak Road	0	0
Douglas	0	0
Downtown	3	0
Dun's Crossing	1	0
Forest Hill	0	0
Fredericton South	1	0
Fulton Heights	6	0

Garden Creek	1	0
Garden Place	0	0
Gilridge Estates	0	0
Golf Club	1	0
Grasse Circle	0	0
Greenwood Minihome Park	0	0
Hanwell North	2	0
Heron Springs	1	0
Highpoint Ridge	0	0
Kelly's Court Minihome Park	0	0
Knob Hill	1	0
Knowledge Park	0	0
Lian / Valcore	0	0
Lincoln	2	0
Lincoln Heights	1	0
Main Street	8	0
Marysville	5	0
McKnight	0	0
McLeod Hill	0	0
Monteith / Talisman	4	0
Montogomery / Prospect East	0	0
Nashwaaksis	3	0
Nethervue Minihome Park	0	0
North Devon	11	0
Northbrook Heights	2	0
Platt	18	0
Poet's Hill	1	0
Prospect	2	0
Rail Side	0	0
Regiment Creek	0	0
Royal Road	2	0
Saint Mary's First Nation	1	0
Saint Thomas University	0	0
Sandyville	2	0
Serenity Lane	0	0
Shadowood Estates	0	0
Silverwood	3	0
Skyline Acrea	2	0
South Devon	16	0
Southwood Park	2	0
Springhill	1	0
Sunshine Gardens	0	0
The Hill	12	1
The Hugh John Flemming Forestry Center	0	0
University Of New Brunswick	1	0
Waterloo Row	2	0
Wesbett / Case	0	0
West Hills	1	0

Williams / Hawkins Area	2	0
Woodstock Road	5	0
Youngs Crossing	2	0

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Crime_Type	MISCHIEF	OBS	USE	MISCHIEF	TO	PROP
Neighbourhood						
Barkers Point	0					7
Brookside	0					0
Brookside Estates	0					1
Brookside Mini Home Park	0					3
College Hill	0					4
Colonial heights	0					0
Cotton Mill Creek	0					3
Diamond Street	0					0
Doak Road	0					0
Douglas	0					0
Downtown	0					29
Dun's Crossing	0					5
Forest Hill	0					0
Fredericton South	0					13
Fulton Heights	0					8
Garden Creek	0					0
Garden Place	0					0
Gilridge Estates	0					0
Golf Club	0					0
Grasse Circle	0					0
Greenwood Minihome Park	0					0
Hanwell North	0					1
Heron Springs	0					0
Highpoint Ridge	0					0
Kelly's Court Minihome Park	0					1
Knob Hill	0					1
Knowledge Park	0					0
Lian / Valcore	0					0
Lincoln	0					1
Lincoln Heights	0					1
Main Street	1					12
Marysville	0					8
McKnight	0					1
McLeod Hill	0					0
Monteith / Talisman	0					0
Montogomery / Prospect East	0					2
Nashwaaksis	0					5
Nethervue Minihome Park	0					0
North Devon	0					40
Northbrook Heights	0					2
Platt	0					31

Poet's Hill	0	1
Prospect	0	16
Rail Side	0	0
Regiment Creek	0	0
Royal Road	0	0
Saint Mary's First Nation	0	6
Saint Thomas University	0	0
Sandyville	0	1
Serenity Lane	0	0
Shadowood Estates	0	2
Silverwood	0	2
Skyline Acrea	0	6
South Devon	0	8
Southwood Park	0	1
Springhill	0	0
Sunshine Gardens	0	1
The Hill	0	7
The Hugh John Flemming Forestry Center	0	0
University Of New Brunswick	0	0
Waterloo Row	0	1
Wesbett / Case	0	0
West Hills	0	2
Williams / Hawkins Area	0	7
Woodstock Road	0	2
Youngs Crossing	0	4

Crime_Type	MISCHIEF-DATA MOTOR VEH THEFT	
Neighbourhood		
Barkers Point	0	2
Brookside	0	2
Brookside Estates	0	1
Brookside Mini Home Park	0	1
College Hill	0	0
Colonial heights	0	0
Cotton Mill Creek	0	1
Diamond Street	0	0
Doak Road	0	0
Douglas	0	2
Downtown	1	4
Dun's Crossing	0	1
Forest Hill	0	0
Fredericton South	0	1
Fulton Heights	0	0
Garden Creek	0	0
Garden Place	0	0
Gilridge Estates	0	1
Golf Club	0	1

Grasse Circle	0	0
Greenwood Minihome Park	0	1
Hanwell North	0	0
Heron Springs	0	0
Highpoint Ridge	0	0
Kelly's Court Minihome Park	0	0
Knob Hill	0	1
Knowledge Park	0	0
Lian / Valcore	1	0
Lincoln	0	0
Lincoln Heights	0	0
Main Street	0	2
Marysville	0	1
McKnight	0	0
McLeod Hill	0	1
Monteith / Talisman	0	0
Montogomery / Prospect East	0	0
Nashwaaksis	0	1
Nethervue Minihome Park	0	0
North Devon	0	0
Northbrook Heights	0	1
Platt	0	3
Poet's Hill	0	0
Prospect	0	0
Rail Side	0	1
Regiment Creek	0	0
Royal Road	0	0
Saint Mary's First Nation	0	3
Saint Thomas University	0	0
Sandyville	0	0
Serenity Lane	0	0
Shadowood Estates	0	1
Silverwood	0	1
Skyline Acrea	0	0
South Devon	0	0
Southwood Park	0	1
Springhill	0	0
Sunshine Gardens	0	0
The Hill	0	0
The Hugh John Flemming Forestry Center	0	0
University Of New Brunswick	0	0
Waterloo Row	0	0
Wesbett / Case	0	0
West Hills	0	0
Williams / Hawkins Area	0	0
Woodstock Road	0	4
Youngs Crossing	0	1

Crime_Type	THEFT BIKE<\$5000	THEFT FROM MV < \$5000
Neighbourhood		
Barkers Point	2	8
Brookside	0	0
Brookside Estates	0	3
Brookside Mini Home Park	0	0
College Hill	2	10
Colonial heights	0	6
Cotton Mill Creek	0	0
Diamond Street	0	1
Doak Road	0	0
Douglas	0	1
Downtown	8	21
Dun's Crossing	0	9
Forest Hill	0	8
Fredericton South	2	20
Fulton Heights	3	12
Garden Creek	0	1
Garden Place	1	3
Gilridge Estates	0	1
Golf Club	0	5
Grasse Circle	0	0
Greenwood Minihome Park	0	0
Hanwell North	0	3
Heron Springs	0	2
Highpoint Ridge	0	4
Kelly's Court Minihome Park	0	0
Knob Hill	0	1
Knowledge Park	0	0
Lian / Valcore	0	1
Lincoln	1	1
Lincoln Heights	0	11
Main Street	3	10
Marysville	1	10
McKnight	0	1
McLeod Hill	0	2
Monteith / Talisman	1	3
Montogomery / Prospect East	0	3
Nashwaaksis	0	9
Nethervue Minihome Park	0	1
North Devon	6	17
Northbrook Heights	0	5
Platt	21	40
Poet's Hill	0	2
Prospect	0	11
Rail Side	0	2
Regiment Creek	0	0

Royal Road	0	0
Saint Mary's First Nation	1	1
Saint Thomas University	0	1
Sandyville	0	3
Serenity Lane	0	0
Shadowood Estates	0	2
Silverwood	0	2
Skyline Acrea	0	13
South Devon	5	22
Southwood Park	1	7
Springhill	0	0
Sunshine Gardens	0	7
The Hill	0	11
The Hugh John Flemming Forestry Center	0	0
University Of New Brunswick	2	4
Waterloo Row	1	3
Wesbett / Case	0	0
West Hills	0	0
Williams / Hawkins Area	0	6
Woodstock Road	2	20
Youngs Crossing	0	6

Crime_Type	THEFT FROM MV > \$5000 THEFT OTH <\$5000	
Neighbourhood		
Barkers Point	0	11
Brookside	0	50
Brookside Estates	0	2
Brookside Mini Home Park	0	0
College Hill	0	8
Colonial heights	0	0
Cotton Mill Creek	0	0
Diamond Street	0	0
Doak Road	0	0
Douglas	0	0
Downtown	0	49
Dun's Crossing	0	2
Forest Hill	0	3
Fredericton South	1	35
Fulton Heights	0	6
Garden Creek	0	7
Garden Place	0	0
Gilridge Estates	0	1
Golf Club	0	0
Grasse Circle	0	0
Greenwood Minihome Park	0	0
Hanwell North	0	1
Heron Springs	0	0

Highpoint Ridge	0	1
Kelly's Court Minihome Park	0	0
Knob Hill	0	0
Knowledge Park	0	0
Lian / Valcore	0	5
Lincoln	0	4
Lincoln Heights	0	0
Main Street	0	33
Marysville	0	10
McKnight	0	2
McLeod Hill	0	0
Monteith / Talisman	0	0
Montgomery / Prospect East	0	11
Nashwaaksis	1	3
Nethervue Minihome Park	0	0
North Devon	0	30
Northbrook Heights	0	0
Platt	0	71
Poet's Hill	0	0
Prospect	2	48
Rail Side	0	0
Regiment Creek	0	1
Royal Road	0	0
Saint Mary's First Nation	0	13
Saint Thomas University	0	0
Sandyville	0	1
Serenity Lane	0	0
Shadowood Estates	0	0
Silverwood	0	4
Skyline Acrea	0	3
South Devon	0	10
Southwood Park	0	4
Springhill	0	0
Sunshine Gardens	0	1
The Hill	0	10
The Hugh John Flemming Forestry Center	0	0
University Of New Brunswick	0	8
Waterloo Row	0	1
Wesbett / Case	0	0
West Hills	0	1
Williams / Hawkins Area	0	1
Woodstock Road	1	5
Youngs Crossing	0	2

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 Crime\_Type THEFT OTH >\$5000 THEFT OVER \$5000  
 Neighbourhood  
 Barkers Point 0 0

Brookside	0	0
Brookside Estates	0	0
Brookside Mini Home Park	0	0
College Hill	0	0
Colonial heights	0	0
Cotton Mill Creek	0	0
Diamond Street	0	0
Doak Road	1	0
Douglas	0	0
Downtown	1	1
Dun's Crossing	0	0
Forest Hill	0	0
Fredericton South	4	0
Fulton Heights	0	0
Garden Creek	1	0
Garden Place	0	0
Gilridge Estates	0	0
Golf Club	0	0
Grasse Circle	0	0
Greenwood Minihome Park	0	0
Hanwell North	0	0
Heron Springs	0	0
Highpoint Ridge	0	0
Kelly's Court Minihome Park	0	0
Knob Hill	0	0
Knowledge Park	0	0
Lian / Valcore	0	0
Lincoln	0	0
Lincoln Heights	0	0
Main Street	2	0
Marysville	0	0
McKnight	0	0
McLeod Hill	0	0
Monteith / Talisman	0	0
Montogomery / Prospect East	0	0
Nashwaaksis	0	0
Nethervue Minihome Park	0	0
North Devon	0	0
Northbrook Heights	0	0
Platt	0	0
Poet's Hill	0	0
Prospect	0	0
Rail Side	0	0
Regiment Creek	0	0
Royal Road	0	0
Saint Mary's First Nation	0	0
Saint Thomas University	0	0
Sandyville	0	0

Serenity Lane	0	0
Shadowood Estates	0	0
Silverwood	0	0
Skyline Acrea	0	0
South Devon	0	0
Southwood Park	0	0
Springhill	0	0
Sunshine Gardens	0	0
The Hill	0	0
The Hugh John Flemming Forestry Center	0	0
University Of New Brunswick	0	0
Waterloo Row	0	0
Wesbett / Case	0	0
West Hills	0	0
Williams / Hawkins Area	0	0
Woodstock Road	0	0
Youngs Crossing	0	0

Crime_Type	Ward		
	THEFT , BIKE>\$5000		ARSON
Neighbourhood			
Barkers Point	0	0	0
Brookside	0	0	0
Brookside Estates	0	0	0
Brookside Mini Home Park	0	0	0
College Hill	0	0	2
Colonial heights	0	0	0
Cotton Mill Creek	0	0	0
Diamond Street	0	0	0
Doak Road	0	0	0
Douglas	0	0	0
Downtown	1	0	1
Dun's Crossing	0	0	0
Forest Hill	0	0	0
Fredericton South	0	1	0
Fulton Heights	0	0	0
Garden Creek	0	0	0
Garden Place	0	0	0
Gilridge Estates	0	0	0
Golf Club	0	0	0
Grasse Circle	0	1	0
Greenwood Minihome Park	0	0	0
Hanwell North	0	0	0
Heron Springs	0	0	0
Highpoint Ridge	0	0	0
Kelly's Court Minihome Park	0	0	0
Knob Hill	0	0	0
Knowledge Park	0	1	0

Lian / Valcore	0	0	0
Lincoln	0	0	0
Lincoln Heights	0	0	0
Main Street	0	0	0
Marysville	0	0	1
McKnight	0	0	0
McLeod Hill	0	0	0
Monteith / Talisman	0	0	0
Montgomery / Prospect East	0	0	0
Nashwaaksis	0	0	0
Nethervue Minihome Park	0	0	0
North Devon	0	0	0
Northbrook Heights	0	0	0
Platt	0	0	0
Poet's Hill	0	0	0
Prospect	1	0	0
Rail Side	0	0	0
Regiment Creek	0	0	0
Royal Road	0	0	0
Saint Mary's First Nation	0	0	0
Saint Thomas University	0	0	0
Sandyville	0	0	0
Serenity Lane	0	0	0
Shadowood Estates	0	0	0
Silverwood	0	0	0
Skyline Acrea	0	0	1
South Devon	0	0	0
Southwood Park	0	0	0
Springhill	0	0	0
Sunshine Gardens	0	0	0
The Hill	0	0	0
The Hugh John Flemming Forestry Center	0	0	0
University Of New Brunswick	0	0	0
Waterloo Row	0	0	0
Wesbett / Case	0	1	0
West Hills	0	0	0
Williams / Hawkins Area	0	0	0
Woodstock Road	0	0	0
Youngs Crossing	0	0	0

Crime_Type	ARSON BY NEG ARSON-DAM.PROP.	
Neighbourhood		
Barkers Point	0	0
Brookside	0	0
Brookside Estates	0	0
Brookside Mini Home Park	0	0
College Hill	0	0

Colonial heights	0	0
Cotton Mill Creek	0	0
Diamond Street	0	0
Doak Road	0	0
Douglas	0	0
Downtown	0	1
Dun's Crossing	0	0
Forest Hill	0	0
Fredericton South	0	0
Fulton Heights	0	0
Garden Creek	0	0
Garden Place	0	0
Gilridge Estates	0	0
Golf Club	0	0
Grasse Circle	0	0
Greenwood Minihome Park	0	0
Hanwell North	0	0
Heron Springs	0	0
Highpoint Ridge	0	0
Kelly's Court Minihome Park	0	0
Knob Hill	0	0
Knowledge Park	0	0
Lian / Valcore	0	0
Lincoln	0	0
Lincoln Heights	0	0
Main Street	0	1
Marysville	0	0
McKnight	0	0
McLeod Hill	0	0
Monteith / Talisman	0	0
Montogomery / Prospect East	0	0
Nashwaaksis	0	1
Nethervue Minihome Park	0	0
North Devon	0	0
Northbrook Heights	0	0
Platt	0	0
Poet's Hill	0	0
Prospect	0	0
Rail Side	0	0
Regiment Creek	0	0
Royal Road	0	0
Saint Mary's First Nation	0	0
Saint Thomas University	0	0
Sandyville	0	0
Serenity Lane	0	0
Shadowood Estates	0	0
Silverwood	0	0
Skyline Acrea	0	0

South Devon	1	0
Southwood Park	0	0
Springhill	0	0
Sunshine Gardens	0	0
The Hill	0	0
The Hugh John Flemming Forestry Center	0	0
University Of New Brunswick	0	0
Waterloo Row	0	0
Wesbett / Case	0	0
West Hills	0	0
Williams / Hawkins Area	0	0
Woodstock Road	0	0
Youngs Crossing	0	1

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Crime_Type	B&E	NON-RESIDNCE	B&E	OTHER
Neighbourhood				
Barkers Point	2		7	
Brookside	2		0	
Brookside Estates	1		1	
Brookside Mini Home Park	0		0	
College Hill	0		2	
Colonial heights	0		0	
Cotton Mill Creek	0		0	
Diamond Street	0		0	
Doak Road	0		0	
Douglas	0		0	
Downtown	7		0	
Dun's Crossing	0		0	
Forest Hill	1		0	
Fredericton South	6		1	
Fulton Heights	1		0	
Garden Creek	2		1	
Garden Place	0		0	
Gilridge Estates	0		0	
Golf Club	0		0	
Grasse Circle	0		0	
Greenwood Minihome Park	0		1	
Hanwell North	0		1	
Heron Springs	0		0	
Highpoint Ridge	0		0	
Kelly's Court Minihome Park	0		0	
Knob Hill	0		0	
Knowledge Park	0		0	
Lian / Valcore	0		0	
Lincoln	2		2	
Lincoln Heights	0		1	
Main Street	2		4	

Marysville	1	2
McKnight	0	0
McLeod Hill	0	0
Monteith / Talisman	2	2
Montgomery / Prospect East	0	0
Nashwaaksis	2	0
Nethervue Minihome Park	0	0
North Devon	5	4
Northbrook Heights	0	0
Platt	4	10
Poet's Hill	0	0
Prospect	1	0
Rail Side	0	0
Regiment Creek	0	0
Royal Road	3	2
Saint Mary's First Nation	0	0
Saint Thomas University	0	0
Sandyville	0	2
Serenity Lane	1	1
Shadowood Estates	0	0
Silverwood	0	0
Skyline Acrea	1	1
South Devon	0	6
Southwood Park	0	0
Springhill	0	0
Sunshine Gardens	0	1
The Hill	2	1
The Hugh John Flemming Forestry Center	1	2
University Of New Brunswick	0	0
Waterloo Row	0	1
Wesbett / Case	0	0
West Hills	0	1
Williams / Hawkins Area	0	1
Woodstock Road	2	0
Youngs Crossing	0	0

Crime_Type	B&E RESIDENCE	B&E STEAL FIREAR
Neighbourhood		\
Barkers Point	7	1
Brookside	0	0
Brookside Estates	0	0
Brookside Mini Home Park	0	1
College Hill	13	0
Colonial heights	3	0
Cotton Mill Creek	0	0
Diamond Street	0	0
Doak Road	0	0

Douglas	0	0
Downtown	3	0
Dun's Crossing	1	0
Forest Hill	0	0
Fredericton South	1	0
Fulton Heights	6	0
Garden Creek	1	0
Garden Place	0	0
Gilridge Estates	0	0
Golf Club	1	0
Grasse Circle	0	0
Greenwood Minihome Park	0	0
Hanwell North	2	0
Heron Springs	1	0
Highpoint Ridge	0	0
Kelly's Court Minihome Park	0	0
Knob Hill	1	0
Knowledge Park	0	0
Lian / Valcore	0	0
Lincoln	2	0
Lincoln Heights	1	0
Main Street	8	0
Marysville	5	0
McKnight	0	0
McLeod Hill	0	0
Monteith / Talisman	4	0
Montgomery / Prospect East	0	0
Nashwaaksis	3	0
Nethervue Minihome Park	0	0
North Devon	11	0
Northbrook Heights	2	0
Platt	18	0
Poet's Hill	1	0
Prospect	2	0
Rail Side	0	0
Regiment Creek	0	0
Royal Road	2	0
Saint Mary's First Nation	1	0
Saint Thomas University	0	0
Sandyville	2	0
Serenity Lane	0	0
Shadowood Estates	0	0
Silverwood	3	0
Skyline Acrea	2	0
South Devon	16	0
Southwood Park	2	0
Springhill	1	0
Sunshine Gardens	0	0

The Hill	12	1
The Hugh John Flemming Forestry Center	0	0
University Of New Brunswick	1	0
Waterloo Row	2	0
Wesbett / Case	0	0
West Hills	1	0
Williams / Hawkins Area	2	0
Woodstock Road	5	0
Youngs Crossing	2	0

Crime_Type	MISCHIEF	OBS	USE	MISCHIEF	TO	PROP
Neighbourhood						
Barkers Point	0				7	
Brookside	0				0	
Brookside Estates	0				1	
Brookside Mini Home Park	0				3	
College Hill	0				4	
Colonial heights	0				0	
Cotton Mill Creek	0				3	
Diamond Street	0				0	
Doak Road	0				0	
Douglas	0				0	
Downtown	0				29	
Dun's Crossing	0				5	
Forest Hill	0				0	
Fredericton South	0				13	
Fulton Heights	0				8	
Garden Creek	0				0	
Garden Place	0				0	
Gilridge Estates	0				0	
Golf Club	0				0	
Grasse Circle	0				0	
Greenwood Minihome Park	0				0	
Hanwell North	0				1	
Heron Springs	0				0	
Highpoint Ridge	0				0	
Kelly's Court Minihome Park	0				1	
Knob Hill	0				1	
Knowledge Park	0				0	
Lian / Valcore	0				0	
Lincoln	0				1	
Lincoln Heights	0				1	
Main Street	1				12	
Marysville	0				8	
McKnight	0				1	
McLeod Hill	0				0	
Monteith / Talisman	0				0	

Montgomery / Prospect East	0	2
Nashwaaksis	0	5
Nethervue Minihome Park	0	0
North Devon	0	40
Northbrook Heights	0	2
Platt	0	31
Poet's Hill	0	1
Prospect	0	16
Rail Side	0	0
Regiment Creek	0	0
Royal Road	0	0
Saint Mary's First Nation	0	6
Saint Thomas University	0	0
Sandyville	0	1
Serenity Lane	0	0
Shadowood Estates	0	2
Silverwood	0	2
Skyline Acrea	0	6
South Devon	0	8
Southwood Park	0	1
Springhill	0	0
Sunshine Gardens	0	1
The Hill	0	7
The Hugh John Flemming Forestry Center	0	0
University Of New Brunswick	0	0
Waterloo Row	0	1
Wesbett / Case	0	0
West Hills	0	2
Williams / Hawkins Area	0	7
Woodstock Road	0	2
Youngs Crossing	0	4

\\

Crime_Type	MISCHIEF	DATA	MOTOR	VEH	THEFT
Neighbourhood					
Barkers Point	0		2		
Brookside	0		2		
Brookside Estates	0		1		
Brookside Mini Home Park	0		1		
College Hill	0		0		
Colonial heights	0		0		
Cotton Mill Creek	0		1		
Diamond Street	0		0		
Doak Road	0		0		
Douglas	0		2		
Downtown	1		4		
Dun's Crossing	0		1		
Forest Hill	0		0		

Fredericton South	0	1
Fulton Heights	0	0
Garden Creek	0	0
Garden Place	0	0
Gilridge Estates	0	1
Golf Club	0	1
Grasse Circle	0	0
Greenwood Minihome Park	0	1
Hanwell North	0	0
Heron Springs	0	0
Highpoint Ridge	0	0
Kelly's Court Minihome Park	0	0
Knob Hill	0	1
Knowledge Park	0	0
Lian / Valcore	1	0
Lincoln	0	0
Lincoln Heights	0	0
Main Street	0	2
Marysville	0	1
McKnight	0	0
McLeod Hill	0	1
Monteith / Talisman	0	0
Montgomery / Prospect East	0	0
Nashwaaksis	0	1
Nethervue Minihome Park	0	0
North Devon	0	0
Northbrook Heights	0	1
Platt	0	3
Poet's Hill	0	0
Prospect	0	0
Rail Side	0	1
Regiment Creek	0	0
Royal Road	0	0
Saint Mary's First Nation	0	3
Saint Thomas University	0	0
Sandyville	0	0
Serenity Lane	0	0
Shadowood Estates	0	1
Silverwood	0	1
Skyline Acrea	0	0
South Devon	0	0
Southwood Park	0	1
Springhill	0	0
Sunshine Gardens	0	0
The Hill	0	0
The Hugh John Flemming Forestry Center	0	0
University Of New Brunswick	0	0
Waterloo Row	0	0

Wesbett / Case	0	0
West Hills	0	0
Williams / Hawkins Area	0	0
Woodstock Road	0	4
Youngs Crossing	0	1

Crime_Type	THEFT BIKE<\$5000 THEFT FROM MV < \$5000	
Neighbourhood		
Barkers Point	2	8
Brookside	0	0
Brookside Estates	0	3
Brookside Mini Home Park	0	0
College Hill	2	10
Colonial heights	0	6
Cotton Mill Creek	0	0
Diamond Street	0	1
Doak Road	0	0
Douglas	0	1
Downtown	8	21
Dun's Crossing	0	9
Forest Hill	0	8
Fredericton South	2	20
Fulton Heights	3	12
Garden Creek	0	1
Garden Place	1	3
Gilridge Estates	0	1
Golf Club	0	5
Grasse Circle	0	0
Greenwood Minihome Park	0	0
Hanwell North	0	3
Heron Springs	0	2
Highpoint Ridge	0	4
Kelly's Court Minihome Park	0	0
Knob Hill	0	1
Knowledge Park	0	0
Lian / Valcore	0	1
Lincoln	1	1
Lincoln Heights	0	11
Main Street	3	10
Marysville	1	10
McKnight	0	1
McLeod Hill	0	2
Monteith / Talisman	1	3
Montogomery / Prospect East	0	3
Nashwaaksis	0	9
Nethervue Minihome Park	0	1
North Devon	6	17

Northbrook Heights	0	5
Platt	21	40
Poet's Hill	0	2
Prospect	0	11
Rail Side	0	2
Regiment Creek	0	0
Royal Road	0	0
Saint Mary's First Nation	1	1
Saint Thomas University	0	1
Sandyville	0	3
Serenity Lane	0	0
Shadowood Estates	0	2
Silverwood	0	2
Skyline Acrea	0	13
South Devon	5	22
Southwood Park	1	7
Springhill	0	0
Sunshine Gardens	0	7
The Hill	0	11
The Hugh John Flemming Forestry Center	0	0
University Of New Brunswick	2	4
Waterloo Row	1	3
Wesbett / Case	0	0
West Hills	0	0
Williams / Hawkins Area	0	6
Woodstock Road	2	20
Youngs Crossing	0	6

Crime_Type	THEFT FROM MV > \$5000 THEFT OTH <\$5000	
Neighbourhood		
Barkers Point	0	11
Brookside	0	50
Brookside Estates	0	2
Brookside Mini Home Park	0	0
College Hill	0	8
Colonial heights	0	0
Cotton Mill Creek	0	0
Diamond Street	0	0
Doak Road	0	0
Douglas	0	0
Downtown	0	49
Dun's Crossing	0	2
Forest Hill	0	3
Fredericton South	1	35
Fulton Heights	0	6
Garden Creek	0	7
Garden Place	0	0

Gilridge Estates	0	1
Golf Club	0	0
Grasse Circle	0	0
Greenwood Minihome Park	0	0
Hanwell North	0	1
Heron Springs	0	0
Highpoint Ridge	0	1
Kelly's Court Minihome Park	0	0
Knob Hill	0	0
Knowledge Park	0	0
Lian / Valcore	0	5
Lincoln	0	4
Lincoln Heights	0	0
Main Street	0	33
Marysville	0	10
McKnight	0	2
McLeod Hill	0	0
Monteith / Talisman	0	0
Montgomery / Prospect East	0	11
Nashwaaksis	1	3
Nethervue Minihome Park	0	0
North Devon	0	30
Northbrook Heights	0	0
Platt	0	71
Poet's Hill	0	0
Prospect	2	48
Rail Side	0	0
Regiment Creek	0	1
Royal Road	0	0
Saint Mary's First Nation	0	13
Saint Thomas University	0	0
Sandyville	0	1
Serenity Lane	0	0
Shadowood Estates	0	0
Silverwood	0	4
Skyline Acrea	0	3
South Devon	0	10
Southwood Park	0	4
Springhill	0	0
Sunshine Gardens	0	1
The Hill	0	10
The Hugh John Flemming Forestry Center	0	0
University Of New Brunswick	0	8
Waterloo Row	0	1
Wesbett / Case	0	0
West Hills	0	1
Williams / Hawkins Area	0	1
Woodstock Road	1	5

Crime_Type	THEFT OTH >\$5000 THEFT OVER \$5000	
Neighbourhood		
Barkers Point	0	0
Brookside	0	0
Brookside Estates	0	0
Brookside Mini Home Park	0	0
College Hill	0	0
Colonial heights	0	0
Cotton Mill Creek	0	0
Diamond Street	0	0
Doak Road	1	0
Douglas	0	0
Downtown	1	1
Dun's Crossing	0	0
Forest Hill	0	0
Fredericton South	4	0
Fulton Heights	0	0
Garden Creek	1	0
Garden Place	0	0
Gilridge Estates	0	0
Golf Club	0	0
Grasse Circle	0	0
Greenwood Minihome Park	0	0
Hanwell North	0	0
Heron Springs	0	0
Highpoint Ridge	0	0
Kelly's Court Minihome Park	0	0
Knob Hill	0	0
Knowledge Park	0	0
Lian / Valcore	0	0
Lincoln	0	0
Lincoln Heights	0	0
Main Street	2	0
Marysville	0	0
McKnight	0	0
McLeod Hill	0	0
Monteith / Talisman	0	0
Montgomery / Prospect East	0	0
Nashwaaksis	0	0
Nethervue Minihome Park	0	0
North Devon	0	0
Northbrook Heights	0	0
Platt	0	0
Poet's Hill	0	0
Prospect	0	0

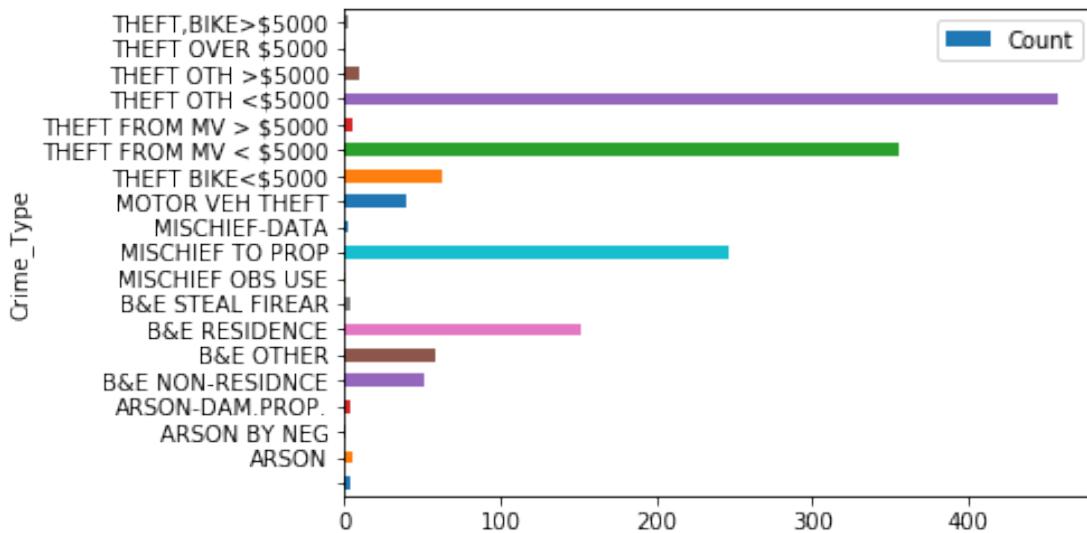
Rail Side	0	0
Regiment Creek	0	0
Royal Road	0	0
Saint Mary's First Nation	0	0
Saint Thomas University	0	0
Sandyville	0	0
Serenity Lane	0	0
Shadowood Estates	0	0
Silverwood	0	0
Skyline Acrea	0	0
South Devon	0	0
Southwood Park	0	0
Springhill	0	0
Sunshine Gardens	0	0
The Hill	0	0
The Hugh John Flemming Forestry Center	0	0
University Of New Brunswick	0	0
Waterloo Row	0	0
Wesbett / Case	0	0
West Hills	0	0
Williams / Hawkins Area	0	0
Woodstock Road	0	0
Youngs Crossing	0	0

Crime_Type	THEFT, BIKE>\$5000
Neighbourhood	
Barkers Point	0
Brookside	0
Brookside Estates	0
Brookside Mini Home Park	0
College Hill	0
Colonial heights	0
Cotton Mill Creek	0
Diamond Street	0
Doak Road	0
Douglas	0
Downtown	1
Dun's Crossing	0
Forest Hill	0
Fredericton South	0
Fulton Heights	0
Garden Creek	0
Garden Place	0
Gilridge Estates	0
Golf Club	0
Grasse Circle	0
Greenwood Minihome Park	0

Hanwell North	0
Heron Springs	0
Highpoint Ridge	0
Kelly's Court Minihome Park	0
Knob Hill	0
Knowledge Park	0
Lian / Valcore	0
Lincoln	0
Lincoln Heights	0
Main Street	0
Marysville	0
McKnight	0
McLeod Hill	0
Monteith / Talisman	0
Montgomery / Prospect East	0
Nashwaaksis	0
Nethervue Minihome Park	0
North Devon	0
Northbrook Heights	0
Platt	0
Poet's Hill	0
Prospect	1
Rail Side	0
Regiment Creek	0
Royal Road	0
Saint Mary's First Nation	0
Saint Thomas University	0
Sandyville	0
Serenity Lane	0
Shadowood Estates	0
Silverwood	0
Skyline Acrea	0
South Devon	0
Southwood Park	0
Springhill	0
Sunshine Gardens	0
The Hill	0
The Hugh John Flemming Forestry Center	0
University Of New Brunswick	0
Waterloo Row	0
Wesbett / Case	0
West Hills	0
Williams / Hawkins Area	0
Woodstock Road	0
Youngs Crossing	0

In [19]: crimetype\_data.plot(x='Crime\_Type', y='Count', kind='barh')

Out[19]: <matplotlib.axes.\_subplots.AxesSubplot at 0x7f33ee0caa20>



## 2.3 Let's examine theft from vehicles

```
In [20]: mvcrime_df = crime_df.loc[crime_df['Crime_Type'] == 'THEFT FROM MV < $5000']
mvcrime_df
```

```
Out[20]:      Neighbourhood  Crime_Code  Crime_Type  Ward \
18        Fredericton South    2142  THEFT FROM MV < $5000    7
19        Fredericton South    2142  THEFT FROM MV < $5000    7
20        Fredericton South    2142  THEFT FROM MV < $5000    7
21        Fredericton South    2142  THEFT FROM MV < $5000   12
22        Fredericton South    2142  THEFT FROM MV < $5000   12
23        Fredericton South    2142  THEFT FROM MV < $5000    7
24        Fredericton South    2142  THEFT FROM MV < $5000    7
25        Fredericton South    2142  THEFT FROM MV < $5000    7
26        Fredericton South    2142  THEFT FROM MV < $5000   11
27        Fredericton South    2142  THEFT FROM MV < $5000   11
28        Fredericton South    2142  THEFT FROM MV < $5000   12
29        Fredericton South    2142  THEFT FROM MV < $5000   12
30        Fredericton South    2142  THEFT FROM MV < $5000    7
51        Barkers Point       2142  THEFT FROM MV < $5000    6
52        Barkers Point       2142  THEFT FROM MV < $5000    6
53        Barkers Point       2142  THEFT FROM MV < $5000    6
54        Barkers Point       2142  THEFT FROM MV < $5000    6
55        Barkers Point       2142  THEFT FROM MV < $5000    6
56        Barkers Point       2142  THEFT FROM MV < $5000    6
57        Barkers Point       2142  THEFT FROM MV < $5000    6
58        Barkers Point       2142  THEFT FROM MV < $5000    6
100       Sandyville          2142  THEFT FROM MV < $5000    5
107       South Devon          2142  THEFT FROM MV < $5000    4
```

108	South Devon	2142	THEFT FROM MV < \$5000	4
109	South Devon	2142	THEFT FROM MV < \$5000	4
110	South Devon	2142	THEFT FROM MV < \$5000	4
111	South Devon	2142	THEFT FROM MV < \$5000	4
112	South Devon	2142	THEFT FROM MV < \$5000	4
113	South Devon	2142	THEFT FROM MV < \$5000	4
114	South Devon	2142	THEFT FROM MV < \$5000	4
115	South Devon	2142	THEFT FROM MV < \$5000	4
116	South Devon	2142	THEFT FROM MV < \$5000	4
117	South Devon	2142	THEFT FROM MV < \$5000	4
118	South Devon	2142	THEFT FROM MV < \$5000	4
119	South Devon	2142	THEFT FROM MV < \$5000	4
120	South Devon	2142	THEFT FROM MV < \$5000	4
121	South Devon	2142	THEFT FROM MV < \$5000	4
122	South Devon	2142	THEFT FROM MV < \$5000	4
123	South Devon	2142	THEFT FROM MV < \$5000	4
124	South Devon	2142	THEFT FROM MV < \$5000	4
125	South Devon	2142	THEFT FROM MV < \$5000	4
126	South Devon	2142	THEFT FROM MV < \$5000	4
127	South Devon	2142	THEFT FROM MV < \$5000	4
128	South Devon	2142	THEFT FROM MV < \$5000	4
151	Sandyville	2142	THEFT FROM MV < \$5000	5
156	Knob Hill	2142	THEFT FROM MV < \$5000	5
165	Youngs Crossing	2142	THEFT FROM MV < \$5000	4
166	Youngs Crossing	2142	THEFT FROM MV < \$5000	4
167	Youngs Crossing	2142	THEFT FROM MV < \$5000	4
168	Youngs Crossing	2142	THEFT FROM MV < \$5000	4
169	Youngs Crossing	2142	THEFT FROM MV < \$5000	4
170	Youngs Crossing	2142	THEFT FROM MV < \$5000	4
201	Marysville	2142	THEFT FROM MV < \$5000	5
252	Marysville	2142	THEFT FROM MV < \$5000	5
278	Douglas	2142	THEFT FROM MV < \$5000	1
280	McLeod Hill	2142	THEFT FROM MV < \$5000	2
281	McLeod Hill	2142	THEFT FROM MV < \$5000	2
301	Marysville	2142	THEFT FROM MV < \$5000	0
302	Marysville	2142	THEFT FROM MV < \$5000	5
303	Marysville	2142	THEFT FROM MV < \$5000	5
304	Marysville	2142	THEFT FROM MV < \$5000	5
305	Marysville	2142	THEFT FROM MV < \$5000	5
306	Marysville	2142	THEFT FROM MV < \$5000	5
307	Marysville	2142	THEFT FROM MV < \$5000	5
308	Marysville	2142	THEFT FROM MV < \$5000	5
330	Saint Mary's First Nation	2142	THEFT FROM MV < \$5000	3
349	Sandyville	2142	THEFT FROM MV < \$5000	5
354	Nashwaaksis	2142	THEFT FROM MV < \$5000	1
355	Nashwaaksis	2142	THEFT FROM MV < \$5000	1
356	Nashwaaksis	2142	THEFT FROM MV < \$5000	1
357	Nashwaaksis	2142	THEFT FROM MV < \$5000	1

358	Nashwaaksis	2142	THEFT FROM MV < \$5000	1
359	Nashwaaksis	2142	THEFT FROM MV < \$5000	1
360	Nashwaaksis	2142	THEFT FROM MV < \$5000	1
361	Nashwaaksis	2142	THEFT FROM MV < \$5000	1
362	Nashwaaksis	2142	THEFT FROM MV < \$5000	1
377	Northbrook Heights	2142	THEFT FROM MV < \$5000	2
378	Northbrook Heights	2142	THEFT FROM MV < \$5000	2
379	Northbrook Heights	2142	THEFT FROM MV < \$5000	1
380	Northbrook Heights	2142	THEFT FROM MV < \$5000	2
381	Northbrook Heights	2142	THEFT FROM MV < \$5000	2
388	Heron Springs	2142	THEFT FROM MV < \$5000	2
389	Heron Springs	2142	THEFT FROM MV < \$5000	2
400	Downtown	2142	THEFT FROM MV < \$5000	10
401	Downtown	2142	THEFT FROM MV < \$5000	11
402	Downtown	2142	THEFT FROM MV < \$5000	11
403	Downtown	2142	THEFT FROM MV < \$5000	10
404	Downtown	2142	THEFT FROM MV < \$5000	10
405	Downtown	2142	THEFT FROM MV < \$5000	10
408	Downtown	2142	THEFT FROM MV < \$5000	10
410	Downtown	2142	THEFT FROM MV < \$5000	10
411	Downtown	2142	THEFT FROM MV < \$5000	10
412	Downtown	2142	THEFT FROM MV < \$5000	10
413	Downtown	2142	THEFT FROM MV < \$5000	10
414	Downtown	2142	THEFT FROM MV < \$5000	10
415	Downtown	2142	THEFT FROM MV < \$5000	10
416	Downtown	2142	THEFT FROM MV < \$5000	10
417	Downtown	2142	THEFT FROM MV < \$5000	10
418	Downtown	2142	THEFT FROM MV < \$5000	10
419	Downtown	2142	THEFT FROM MV < \$5000	10
420	Downtown	2142	THEFT FROM MV < \$5000	10
421	Downtown	2142	THEFT FROM MV < \$5000	10
422	Downtown	2142	THEFT FROM MV < \$5000	10
506	Downtown	2142	THEFT FROM MV < \$5000	10
520	Fulton Heights	2142	THEFT FROM MV < \$5000	3
521	Fulton Heights	2142	THEFT FROM MV < \$5000	3
522	Fulton Heights	2142	THEFT FROM MV < \$5000	3
523	Fulton Heights	2142	THEFT FROM MV < \$5000	3
524	Fulton Heights	2142	THEFT FROM MV < \$5000	2
525	Fulton Heights	2142	THEFT FROM MV < \$5000	3
526	Fulton Heights	2142	THEFT FROM MV < \$5000	3
527	Fulton Heights	2142	THEFT FROM MV < \$5000	3
528	Fulton Heights	2142	THEFT FROM MV < \$5000	3
529	Fulton Heights	2142	THEFT FROM MV < \$5000	2
530	Fulton Heights	2142	THEFT FROM MV < \$5000	3
531	Fulton Heights	2142	THEFT FROM MV < \$5000	3
569	Main Street	2142	THEFT FROM MV < \$5000	2
570	Main Street	2142	THEFT FROM MV < \$5000	3
571	Main Street	2142	THEFT FROM MV < \$5000	2

572	Main Street	2142	THEFT FROM MV < \$5000	2
573	Main Street	2142	THEFT FROM MV < \$5000	3
574	Main Street	2142	THEFT FROM MV < \$5000	2
575	Main Street	2142	THEFT FROM MV < \$5000	2
576	Main Street	2142	THEFT FROM MV < \$5000	2
577	Main Street	2142	THEFT FROM MV < \$5000	2
578	Main Street	2142	THEFT FROM MV < \$5000	2
604	Golf Club	2142	THEFT FROM MV < \$5000	12
614	Gilridge Estates	2142	THEFT FROM MV < \$5000	1
622	Nethervue Minihome Park	2142	THEFT FROM MV < \$5000	12
625	Monteith / Talisman	2142	THEFT FROM MV < \$5000	12
626	Monteith / Talisman	2142	THEFT FROM MV < \$5000	12
631	Garden Creek	2142	THEFT FROM MV < \$5000	12
640	Highpoint Ridge	2142	THEFT FROM MV < \$5000	12
641	Highpoint Ridge	2142	THEFT FROM MV < \$5000	12
642	Highpoint Ridge	2142	THEFT FROM MV < \$5000	12
643	Highpoint Ridge	2142	THEFT FROM MV < \$5000	12
650	Golf Club	2142	THEFT FROM MV < \$5000	12
651	Golf Club	2142	THEFT FROM MV < \$5000	12
653	Golf Club	2142	THEFT FROM MV < \$5000	12
752	Golf Club	2142	THEFT FROM MV < \$5000	12
764	Woodstock Road	2142	THEFT FROM MV < \$5000	12
765	Woodstock Road	2142	THEFT FROM MV < \$5000	12
766	Woodstock Road	2142	THEFT FROM MV < \$5000	12
767	Woodstock Road	2142	THEFT FROM MV < \$5000	12
768	Woodstock Road	2142	THEFT FROM MV < \$5000	12
769	Woodstock Road	2142	THEFT FROM MV < \$5000	12
770	Woodstock Road	2142	THEFT FROM MV < \$5000	12
771	Woodstock Road	2142	THEFT FROM MV < \$5000	12
772	Woodstock Road	2142	THEFT FROM MV < \$5000	12
773	Woodstock Road	2142	THEFT FROM MV < \$5000	12
774	Woodstock Road	2142	THEFT FROM MV < \$5000	12
775	Woodstock Road	2142	THEFT FROM MV < \$5000	12
776	Woodstock Road	2142	THEFT FROM MV < \$5000	0
777	Woodstock Road	2142	THEFT FROM MV < \$5000	12
778	Woodstock Road	2142	THEFT FROM MV < \$5000	12
779	Woodstock Road	2142	THEFT FROM MV < \$5000	12
780	Woodstock Road	2142	THEFT FROM MV < \$5000	12
781	Woodstock Road	2142	THEFT FROM MV < \$5000	12
787	Sunshine Gardens	2142	THEFT FROM MV < \$5000	10
788	Sunshine Gardens	2142	THEFT FROM MV < \$5000	10
789	Sunshine Gardens	2142	THEFT FROM MV < \$5000	10
790	Sunshine Gardens	2142	THEFT FROM MV < \$5000	10
791	Sunshine Gardens	2142	THEFT FROM MV < \$5000	10
792	Sunshine Gardens	2142	THEFT FROM MV < \$5000	10
793	Sunshine Gardens	2142	THEFT FROM MV < \$5000	10
809	Platt	2142	THEFT FROM MV < \$5000	0
810	Platt	2142	THEFT FROM MV < \$5000	11

811	Platt	2142	THEFT FROM MV < \$5000	11
812	Platt	2142	THEFT FROM MV < \$5000	10
813	Platt	2142	THEFT FROM MV < \$5000	11
814	Platt	2142	THEFT FROM MV < \$5000	10
815	Platt	2142	THEFT FROM MV < \$5000	10
816	Platt	2142	THEFT FROM MV < \$5000	10
817	Platt	2142	THEFT FROM MV < \$5000	10
818	Platt	2142	THEFT FROM MV < \$5000	10
819	Platt	2142	THEFT FROM MV < \$5000	11
820	Platt	2142	THEFT FROM MV < \$5000	10
821	Platt	2142	THEFT FROM MV < \$5000	10
822	Platt	2142	THEFT FROM MV < \$5000	10
823	Platt	2142	THEFT FROM MV < \$5000	10
824	Platt	2142	THEFT FROM MV < \$5000	10
825	Platt	2142	THEFT FROM MV < \$5000	0
826	Platt	2142	THEFT FROM MV < \$5000	11
827	Platt	2142	THEFT FROM MV < \$5000	10
828	Platt	2142	THEFT FROM MV < \$5000	10
829	Platt	2142	THEFT FROM MV < \$5000	10
830	Platt	2142	THEFT FROM MV < \$5000	11
831	Platt	2142	THEFT FROM MV < \$5000	11
832	Platt	2142	THEFT FROM MV < \$5000	10
833	Platt	2142	THEFT FROM MV < \$5000	11
835	Platt	2142	THEFT FROM MV < \$5000	10
836	Platt	2142	THEFT FROM MV < \$5000	11
837	Platt	2142	THEFT FROM MV < \$5000	10
838	Platt	2142	THEFT FROM MV < \$5000	10
839	Platt	2142	THEFT FROM MV < \$5000	11
840	Platt	2142	THEFT FROM MV < \$5000	10
841	Platt	2142	THEFT FROM MV < \$5000	10
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843	Platt	2142	THEFT FROM MV < \$5000	10
844	Platt	2142	THEFT FROM MV < \$5000	10
845	Platt	2142	THEFT FROM MV < \$5000	11
846	Platt	2142	THEFT FROM MV < \$5000	10
847	Platt	2142	THEFT FROM MV < \$5000	10
848	Platt	2142	THEFT FROM MV < \$5000	11
849	Platt	2142	THEFT FROM MV < \$5000	10
855	Southwood Park	2142	THEFT FROM MV < \$5000	7
856	Southwood Park	2142	THEFT FROM MV < \$5000	7
857	Southwood Park	2142	THEFT FROM MV < \$5000	7
865	Lincoln Heights	2142	THEFT FROM MV < \$5000	7
866	Lincoln Heights	2142	THEFT FROM MV < \$5000	7
867	Lincoln Heights	2142	THEFT FROM MV < \$5000	7
868	Lincoln Heights	2142	THEFT FROM MV < \$5000	7
869	Lincoln Heights	2142	THEFT FROM MV < \$5000	7
871	Lincoln Heights	2142	THEFT FROM MV < \$5000	7
875	Lincoln Heights	2142	THEFT FROM MV < \$5000	7

880	Skyline Acrea	2142	THEFT FROM MV < \$5000	8
881	Lincoln Heights	2142	THEFT FROM MV < \$5000	7
886	Skyline Acrea	2142	THEFT FROM MV < \$5000	8
887	Lincoln Heights	2142	THEFT FROM MV < \$5000	7
892	Skyline Acrea	2142	THEFT FROM MV < \$5000	8
893	Lincoln Heights	2142	THEFT FROM MV < \$5000	7
898	Skyline Acrea	2142	THEFT FROM MV < \$5000	8
899	Skyline Acrea	2142	THEFT FROM MV < \$5000	8
900	Skyline Acrea	2142	THEFT FROM MV < \$5000	8
901	Skyline Acrea	2142	THEFT FROM MV < \$5000	8
902	Skyline Acrea	2142	THEFT FROM MV < \$5000	8
903	Skyline Acrea	2142	THEFT FROM MV < \$5000	8
904	Skyline Acrea	2142	THEFT FROM MV < \$5000	8
905	Skyline Acrea	2142	THEFT FROM MV < \$5000	8
906	Skyline Acrea	2142	THEFT FROM MV < \$5000	8
907	Skyline Acrea	2142	THEFT FROM MV < \$5000	8
913	Poet's Hill	2142	THEFT FROM MV < \$5000	8
914	Poet's Hill	2142	THEFT FROM MV < \$5000	8
922	Dun's Crossing	2142	THEFT FROM MV < \$5000	8
923	Dun's Crossing	2142	THEFT FROM MV < \$5000	8
924	Dun's Crossing	2142	THEFT FROM MV < \$5000	8
925	Dun's Crossing	2142	THEFT FROM MV < \$5000	8
926	Dun's Crossing	2142	THEFT FROM MV < \$5000	8
927	Dun's Crossing	2142	THEFT FROM MV < \$5000	8
928	Dun's Crossing	2142	THEFT FROM MV < \$5000	8
929	Dun's Crossing	2142	THEFT FROM MV < \$5000	8
930	Dun's Crossing	2142	THEFT FROM MV < \$5000	8
938	Southwood Park	2142	THEFT FROM MV < \$5000	7
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940	Southwood Park	2142	THEFT FROM MV < \$5000	7
941	Southwood Park	2142	THEFT FROM MV < \$5000	7
946	The Hill	2142	THEFT FROM MV < \$5000	9
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948	The Hill	2142	THEFT FROM MV < \$5000	9
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950	The Hill	2142	THEFT FROM MV < \$5000	10
951	The Hill	2142	THEFT FROM MV < \$5000	11
952	The Hill	2142	THEFT FROM MV < \$5000	9
954	The Hill	2142	THEFT FROM MV < \$5000	10
955	The Hill	2142	THEFT FROM MV < \$5000	10
956	The Hill	2142	THEFT FROM MV < \$5000	9
957	The Hill	2142	THEFT FROM MV < \$5000	9
969	Forest Hill	2142	THEFT FROM MV < \$5000	8
970	Forest Hill	2142	THEFT FROM MV < \$5000	8
971	Forest Hill	2142	THEFT FROM MV < \$5000	8
972	Forest Hill	2142	THEFT FROM MV < \$5000	8
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974	Forest Hill	2142	THEFT FROM MV < \$5000	8

975	Forest Hill	2142	THEFT FROM MV < \$5000	8
976	Forest Hill	2142	THEFT FROM MV < \$5000	8
989	Lincoln Heights	2142	THEFT FROM MV < \$5000	7
996	Diamond Street	2142	THEFT FROM MV < \$5000	1
1027	College Hill	2142	THEFT FROM MV < \$5000	11
1028	College Hill	2142	THEFT FROM MV < \$5000	11
1029	College Hill	2142	THEFT FROM MV < \$5000	11
1030	College Hill	2142	THEFT FROM MV < \$5000	11
1031	College Hill	2142	THEFT FROM MV < \$5000	11
1032	College Hill	2142	THEFT FROM MV < \$5000	11
1033	College Hill	2142	THEFT FROM MV < \$5000	11
1034	College Hill	2142	THEFT FROM MV < \$5000	11
1035	College Hill	2142	THEFT FROM MV < \$5000	11
1036	College Hill	2142	THEFT FROM MV < \$5000	11
1060	Brookside Estates	2142	THEFT FROM MV < \$5000	2
1061	Brookside Estates	2142	THEFT FROM MV < \$5000	2
1062	Brookside Estates	2142	THEFT FROM MV < \$5000	2
1116	Lincoln	2142	THEFT FROM MV < \$5000	7
1124	Colonial heights	2142	THEFT FROM MV < \$5000	12
1125	Colonial heights	2142	THEFT FROM MV < \$5000	12
1126	Colonial heights	2142	THEFT FROM MV < \$5000	12
1127	Colonial heights	2142	THEFT FROM MV < \$5000	12
1128	Colonial heights	2142	THEFT FROM MV < \$5000	11
1129	Colonial heights	2142	THEFT FROM MV < \$5000	11
1131	Garden Place	2142	THEFT FROM MV < \$5000	12
1132	Garden Place	2142	THEFT FROM MV < \$5000	12
1133	Garden Place	2142	THEFT FROM MV < \$5000	12
1144	Waterloo Row	2142	THEFT FROM MV < \$5000	11
1145	Waterloo Row	2142	THEFT FROM MV < \$5000	11
1146	Waterloo Row	2142	THEFT FROM MV < \$5000	11
1151	University Of New Brunswick	2142	THEFT FROM MV < \$5000	11
1152	University Of New Brunswick	2142	THEFT FROM MV < \$5000	11
1153	University Of New Brunswick	2142	THEFT FROM MV < \$5000	11
1154	University Of New Brunswick	2142	THEFT FROM MV < \$5000	11
1163	Saint Thomas University	2142	THEFT FROM MV < \$5000	11
1173	Williams / Hawkins Area	2142	THEFT FROM MV < \$5000	2
1174	Williams / Hawkins Area	2142	THEFT FROM MV < \$5000	2
1175	Williams / Hawkins Area	2142	THEFT FROM MV < \$5000	2
1176	Williams / Hawkins Area	2142	THEFT FROM MV < \$5000	2
1177	Williams / Hawkins Area	2142	THEFT FROM MV < \$5000	2
1178	Williams / Hawkins Area	2142	THEFT FROM MV < \$5000	2
1181	McKnight	2142	THEFT FROM MV < \$5000	2
1187	Shadowood Estates	2142	THEFT FROM MV < \$5000	2
1188	Shadowood Estates	2142	THEFT FROM MV < \$5000	2
1240	Lian / Valcore	2142	THEFT FROM MV < \$5000	12
1284	North Devon	2142	THEFT FROM MV < \$5000	4
1285	North Devon	2142	THEFT FROM MV < \$5000	4
1286	North Devon	2142	THEFT FROM MV < \$5000	4

1287	North Devon	2142	THEFT FROM MV < \$5000	4
1288	North Devon	2142	THEFT FROM MV < \$5000	4
1289	North Devon	2142	THEFT FROM MV < \$5000	4
1290	North Devon	2142	THEFT FROM MV < \$5000	4
1302	Rail Side	2142	THEFT FROM MV < \$5000	12
1306	Rail Side	2142	THEFT FROM MV < \$5000	12
1316	Silverwood	2142	THEFT FROM MV < \$5000	12
1317	Silverwood	2142	THEFT FROM MV < \$5000	12
1339	Prospect	2142	THEFT FROM MV < \$5000	9
1340	Prospect	2142	THEFT FROM MV < \$5000	9
1341	Prospect	2142	THEFT FROM MV < \$5000	9
1342	Prospect	2142	THEFT FROM MV < \$5000	9
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1344	Prospect	2142	THEFT FROM MV < \$5000	9
1345	Prospect	2142	THEFT FROM MV < \$5000	11
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1348	Prospect	2142	THEFT FROM MV < \$5000	9
1349	Prospect	2142	THEFT FROM MV < \$5000	9
1369	North Devon	2142	THEFT FROM MV < \$5000	3
1370	North Devon	2142	THEFT FROM MV < \$5000	3
1371	North Devon	2142	THEFT FROM MV < \$5000	3
1372	North Devon	2142	THEFT FROM MV < \$5000	3
1377	North Devon	2142	THEFT FROM MV < \$5000	3
1380	Hanwell North	2142	THEFT FROM MV < \$5000	12
1381	Hanwell North	2142	THEFT FROM MV < \$5000	12
1382	Hanwell North	2142	THEFT FROM MV < \$5000	12
1387	Montgomery / Prospect East	2142	THEFT FROM MV < \$5000	11
1388	Montgomery / Prospect East	2142	THEFT FROM MV < \$5000	11
1389	Montgomery / Prospect East	2142	THEFT FROM MV < \$5000	9
1403	Fredericton South	2142	THEFT FROM MV < \$5000	7
1408	Fredericton South	2142	THEFT FROM MV < \$5000	12
1409	Fredericton South	2142	THEFT FROM MV < \$5000	12
1410	Fredericton South	2142	THEFT FROM MV < \$5000	12
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1412	Fredericton South	2142	THEFT FROM MV < \$5000	12
1413	Fredericton South	2142	THEFT FROM MV < \$5000	12
1420	Woodstock Road	2142	THEFT FROM MV < \$5000	12
1421	Woodstock Road	2142	THEFT FROM MV < \$5000	10
1437	North Devon	2142	THEFT FROM MV < \$5000	3
1438	North Devon	2142	THEFT FROM MV < \$5000	3
1439	North Devon	2142	THEFT FROM MV < \$5000	3
1440	North Devon	2142	THEFT FROM MV < \$5000	3
1441	North Devon	2142	THEFT FROM MV < \$5000	3
1459	Monteith / Talisman	2142	THEFT FROM MV < \$5000	12

City      FID  
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1127	Fredericton	1128
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1176	Fredericton	1177
1177	Fredericton	1178
1178	Fredericton	1179
1181	Fredrichton	1182
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1371	Fredericton	1372
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1382 Fredericton 1383
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1389 Fredericton 1390
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1421 Fredericton 1422
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1438 Fredericton 1439
1439 Fredericton 1440
1440 Fredericton 1441
1441 Fredericton 1442
1459 Fredericton 1460
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In [21]: mvcrime_data = mvcrime_df.groupby(['Neighbourhood']).size().to_frame(name='Count').reset_index()
mvcrime_data
```

```
Out[21]:
```

	Neighbourhood	Count
0	Barkers Point	8
1	Brookside Estates	3
2	College Hill	10
3	Colonial heights	6
4	Diamond Street	1
5	Douglas	1
6	Downtown	21
7	Dun's Crossing	9
8	Forest Hill	8
9	Fredericton South	20
10	Fulton Heights	12
11	Garden Creek	1
12	Garden Place	3
13	Gilridge Estates	1
14	Golf Club	5
15	Hanwell North	3
16	Heron Springs	2
17	Highpoint Ridge	4
18	Knob Hill	1
19	Lian / Valcore	1
20	Lincoln	1
21	Lincoln Heights	11
22	Main Street	10
23	Marysville	10

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24                  McKnight      1
25                  McLeod Hill    2
26      Monteith / Talisman    3
27  Montogomery / Prospect East  3
28                  Nashwaaksis   9
29      Nethervue Minihome Park  1
30                  North Devon   17
31      Northbrook Heights     5
32                  Platt        40
33      Poet's Hill            2
34                  Prospect     11
35                  Rail Side    2
36  Saint Mary's First Nation   1
37      Saint Thomas University 1
38                  Sandyville   3
39      Shadowood Estates      2
40                  Silverwood   2
41      Skyline Acrea          13
42      South Devon             22
43      Southwood Park          7
44      Sunshine Gardens        7
45      The Hill                11
46  University Of New Brunswick 4
47      Waterloo Row           3
48  Williams / Hawkins Area    6
49      Woodstock Road         20
50      Youngs Crossing         6

```

In [22]: mvcrime\_data.describe()

Out[22]:

	Count
count	51.000000
mean	6.980392
std	7.457855
min	1.000000
25%	2.000000
50%	4.000000
75%	10.000000
max	40.000000

In [23]: mvcrime\_data.rename({'Platt': 'Plat'}, inplace=True)

```

mvcrime_data.rename(index=str, columns={'Neighbourhood':'Neighbour', 'Count':'MVCrime_Co
mvcrime_data

```

Out[23]:

	Neighbour	MVCrime_Count
0	Barkers Point	8
1	Brookside Estates	3
2	College Hill	10
3	Colonial heights	6

4	Diamond Street	1
5	Douglas	1
6	Downtown	21
7	Dun's Crossing	9
8	Forest Hill	8
9	Fredericton South	20
10	Fulton Heights	12
11	Garden Creek	1
12	Garden Place	3
13	Gilridge Estates	1
14	Golf Club	5
15	Hanwell North	3
16	Heron Springs	2
17	Highpoint Ridge	4
18	Knob Hill	1
19	Lian / Valcore	1
20	Lincoln	1
21	Lincoln Heights	11
22	Main Street	10
23	Marysville	10
24	McKnight	1
25	McLeod Hill	2
26	Monteith / Talisman	3
27	Montgomery / Prospect East	3
28	Nashwaaksis	9
29	Nethervue Minihome Park	1
30	North Devon	17
31	Northbrook Heights	5
32	Platt	40
33	Poet's Hill	2
34	Prospect	11
35	Rail Side	2
36	Saint Mary's First Nation	1
37	Saint Thomas University	1
38	Sandyville	3
39	Shadowood Estates	2
40	Silverwood	2
41	Skyline Acrea	13
42	South Devon	22
43	Southwood Park	7
44	Sunshine Gardens	7
45	The Hill	11
46	University Of New Brunswick	4
47	Waterloo Row	3
48	Williams / Hawkins Area	6
49	Woodstock Road	20
50	Youngs Crossing	6

```
In [24]: world_geo = r'world_countries.json' # geojson file

    fredericton_c_map = folium.Map(location=[45.91, -66.65], width=1000, height=750,zoom_st

    fredericton_c_map

Out[24]: <folium.folium.Map at 0x7f33ee062be0>

In [ ]:

In [25]: ## Motor Vehicle Crime <$5000 Count
    fredericton_geo = r.json()
    threshold_scale = np.linspace(mvcrime_data['MVCrime_Count'].min(), mvcrime_data['MVCrim
    threshold_scale = threshold_scale.tolist()
    threshold_scale[-1] = threshold_scale[-1]+1

    fredericton_c_map.choropleth(geo_data=frdericton_geo,data=mvcrime_data,columns=['Neigh
        threshold_scale=threshold_scale, fill_color='YlOrRd',fill_opacity=0.7,line_opacity=
    frdericton_c_map

Out[25]: <folium.folium.Map at 0x7f33ee062be0>
```

In [ ]:

## 2.4 Is it possible the higher rate of crime in the downtown area is due to population density?

```
In [26]: demog_df = pd.read_csv("Census_Ttract_Demographics.csv")
demog_df.head()
```

```
Out[26]:   FID  OBJECTID      DBUID      DAUID      CDUID      CTUID      CTNAME      DBuid_1 \
0     1      501  1310024304  13100243  1310  3200002.0      2.0  1310024304
1     2      502  1310032004  13100320  1310  3200010.0     10.0  1310032004
2     3      503  1310017103  13100171  1310  3200014.0     14.0  1310017103
3     4      504  1310018301  13100183  1310  3200012.0     12.0  1310018301
4     5      505  1310022905  13100229  1310  3200007.0      7.0  1310022905

      DBpop2011  DBtdwell120  DBurdwell12  Shape_Leng  Shape_Area  CTIDLINK \
0            60          25          22  0.007462  0.000003  3200002
1            15           3           3  0.009008  0.000003  3200010
2             0           0           0  0.010602  0.000007  3200014
3            108          60          50  0.039599  0.000068  3200012
4            129          47          44  0.011833  0.000005  3200007

      Shape__Area  Shape__Length
0    0.000003    0.007462
1    0.000003    0.009008
2    0.000007    0.010602
3    0.000068    0.039599
4    0.000005    0.011834
```

```
In [27]: # Population Density
world_geo = r'world_countries.json' # geojson file
fredericton_d_map = folium.Map(location=[45.94, -66.63], width=1200, height=750,zoom_start=11)
fredericton_d_map

threshold_scale = np.linspace(demog_df['DBpop2011'].min(),demog_df['DBpop2011'].max(),6)
threshold_scale = threshold_scale.tolist()
threshold_scale[-1] = threshold_scale[-1]+1

fredericton_d_map.choropleth(geo_data=world_geo,data=demog_df,columns=['OBJECTID','DBpop2011'],
                             threshold_scale=threshold_scale,fill_color='PuBuGn',fill_opacity=0.7, line_opacity=0.5)
fredericton_d_map
```

Out[27]: <folium.folium.Map at 0x7f33edf465f8>

## 2.5 Let's look at specific locations in Fredericton

```
In [28]: pointbook = 'Fredericton Locations.xlsx'

workbook_2 = pd.ExcelFile(pointbook)
print(workbook_2.sheet_names)

['Sheet1']
```

```
In [29]: location_df = workbook_2.parse('Sheet1')
location_df
```

```
Out[29]:
```

	Location	Latitude	Longitude
0	Knowledge Park	45.931143	-66.652700
1	Fredericton Downtown	45.963026	-66.383550
2	Fredericton Hill	45.948512	-66.656045
3	Nashwaaksis	45.983382	-66.644856
4	University of New Brunswick	45.948121	-66.641406
5	Devon	45.968802	-66.622738
6	New Maryland	45.892795	-66.683673
7	Marysville	45.978913	-66.589491
8	Skyline Acres	45.931827	-66.640339
9	Hanwell	45.902315	-66.755113

### 2.5.1 Add location markers to map

```
In [30]: for lat, lng, point in zip(location_df['Latitude'], location_df['Longitude'], location_df['Location']):
    label = '{}'.format(point)
    label = folium.Popup(label, parse_html=True)
    folium.CircleMarker([lat, lng], radius=1, popup=label, color='blue', fill=True, fill_color='white', fill_opacity=0.8, parse_html=False).add_to(fredericton_c_map)
fredericton_c_map
```

```
Out[30]: <folium.folium.Map at 0x7f33ee062be0>
```

```
In [ ]:
```

## 2.6 Explore Fredericton Neighbourhoods

### 2.6.1 Define Foursquare Credentials and Version

```
In [31]: CLIENT_ID = 'ZDZQDD0B320RH4QOA5FW12XS1JAQ3ABKLJ3S4H5JZPMJ33QU'
CLIENT_SECRET = 'WQZEFI2A5QB443AI2L1I4BS32RDCGJOSY2MMDD4BEDHL0VTU'
VERSION = '20181201'

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

Your credentails:

```
CLIENT_ID: ZDZQDD0B320RH4QOA5FW12XS1JAQ3ABKLJ3S4H5JZPMJ33QU
CLIENT_SECRET: WQZEFI2A5QB443AI2L1I4BS32RDCGJOSY2MMDD4BEDHL0VTU
```

### 2.6.2 Let's take a look at nearby venues

```
In [32]: def getNearbyVenues(names, latitudes, longitudes, radius=1000, LIMIT=100):

    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_secret='
              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']['id'],
```

```

        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 venue_
nearby_venues.columns = ['Location',
                         'Location Latitude',
                         'Location Longitude',
                         'Venue',
                         'Venue id',
                         'Venue Latitude',
                         'Venue Longitude',
                         'Venue Category'
                         ])

return(nearby_venues)

```

```
In [33]: fredericton_data_venues = getNearbyVenues(names=location_df['Location'],
                                                    latitudes=location_df['Latitude'],
                                                    longitudes=location_df['Longitude']
                                                    )
```

Knowledge Park  
Fredericton Downtown  
Fredericton Hill  
Nashwaaksis  
University of New Brunswick  
Devon  
New Maryland  
Marysville  
Skyline Acres  
Hanwell

```
In [34]: print(fredericton_data_venues.shape)
fredericton_data_venues
```

(98, 8)

```
Out[34]:
```

	Location	Location Latitude	Location Longitude	\
0	Knowledge Park	45.931143	-66.652700	
1	Knowledge Park	45.931143	-66.652700	
2	Knowledge Park	45.931143	-66.652700	
3	Knowledge Park	45.931143	-66.652700	
4	Knowledge Park	45.931143	-66.652700	
5	Knowledge Park	45.931143	-66.652700	
6	Knowledge Park	45.931143	-66.652700	
7	Knowledge Park	45.931143	-66.652700	

8	Knowledge Park	45.931143	-66.652700
9	Knowledge Park	45.931143	-66.652700
10	Knowledge Park	45.931143	-66.652700
11	Knowledge Park	45.931143	-66.652700
12	Knowledge Park	45.931143	-66.652700
13	Knowledge Park	45.931143	-66.652700
14	Knowledge Park	45.931143	-66.652700
15	Knowledge Park	45.931143	-66.652700
16	Knowledge Park	45.931143	-66.652700
17	Knowledge Park	45.931143	-66.652700
18	Knowledge Park	45.931143	-66.652700
19	Knowledge Park	45.931143	-66.652700
20	Knowledge Park	45.931143	-66.652700
21	Knowledge Park	45.931143	-66.652700
22	Knowledge Park	45.931143	-66.652700
23	Knowledge Park	45.931143	-66.652700
24	Knowledge Park	45.931143	-66.652700
25	Knowledge Park	45.931143	-66.652700
26	Knowledge Park	45.931143	-66.652700
27	Knowledge Park	45.931143	-66.652700
28	Knowledge Park	45.931143	-66.652700
29	Knowledge Park	45.931143	-66.652700
30	Fredericton Hill	45.948512	-66.656045
31	Fredericton Hill	45.948512	-66.656045
32	Fredericton Hill	45.948512	-66.656045
33	Fredericton Hill	45.948512	-66.656045
34	Fredericton Hill	45.948512	-66.656045
35	Fredericton Hill	45.948512	-66.656045
36	Fredericton Hill	45.948512	-66.656045
37	Fredericton Hill	45.948512	-66.656045
38	Fredericton Hill	45.948512	-66.656045
39	Fredericton Hill	45.948512	-66.656045
40	Fredericton Hill	45.948512	-66.656045
41	Fredericton Hill	45.948512	-66.656045
42	Fredericton Hill	45.948512	-66.656045
43	Fredericton Hill	45.948512	-66.656045
44	Fredericton Hill	45.948512	-66.656045
45	Nashwaaksis	45.983382	-66.644856
46	Nashwaaksis	45.983382	-66.644856
47	Nashwaaksis	45.983382	-66.644856
48	Nashwaaksis	45.983382	-66.644856
49	Nashwaaksis	45.983382	-66.644856
50	Nashwaaksis	45.983382	-66.644856
51	Nashwaaksis	45.983382	-66.644856
52	Nashwaaksis	45.983382	-66.644856
53	Nashwaaksis	45.983382	-66.644856
54	Nashwaaksis	45.983382	-66.644856
55	Nashwaaksis	45.983382	-66.644856

56	Nashwaaksis	45.983382	-66.644856
57	Nashwaaksis	45.983382	-66.644856
58	Nashwaaksis	45.983382	-66.644856
59	Nashwaaksis	45.983382	-66.644856
60	Nashwaaksis	45.983382	-66.644856
61	Nashwaaksis	45.983382	-66.644856
62	University of New Brunswick	45.948121	-66.641406
63	University of New Brunswick	45.948121	-66.641406
64	University of New Brunswick	45.948121	-66.641406
65	University of New Brunswick	45.948121	-66.641406
66	University of New Brunswick	45.948121	-66.641406
67	University of New Brunswick	45.948121	-66.641406
68	University of New Brunswick	45.948121	-66.641406
69	University of New Brunswick	45.948121	-66.641406
70	University of New Brunswick	45.948121	-66.641406
71	Devon	45.968802	-66.622738
72	Devon	45.968802	-66.622738
73	Devon	45.968802	-66.622738
74	Devon	45.968802	-66.622738
75	Devon	45.968802	-66.622738
76	Devon	45.968802	-66.622738
77	Devon	45.968802	-66.622738
78	Devon	45.968802	-66.622738
79	Devon	45.968802	-66.622738
80	Devon	45.968802	-66.622738
81	Devon	45.968802	-66.622738
82	Devon	45.968802	-66.622738
83	New Maryland	45.892795	-66.683673
84	New Maryland	45.892795	-66.683673
85	New Maryland	45.892795	-66.683673
86	New Maryland	45.892795	-66.683673
87	New Maryland	45.892795	-66.683673
88	New Maryland	45.892795	-66.683673
89	Marysville	45.978913	-66.589491
90	Marysville	45.978913	-66.589491
91	Marysville	45.978913	-66.589491
92	Marysville	45.978913	-66.589491
93	Marysville	45.978913	-66.589491
94	Skyline Acres	45.931827	-66.640339
95	Skyline Acres	45.931827	-66.640339
96	Skyline Acres	45.931827	-66.640339
97	Skyline Acres	45.931827	-66.640339

	Venue \
0	Costco Wholesale
1	PetSmart
2	Montana's
3	Boston Pizza

4 Michaels  
5 Alcool NB Liquor  
6 Best Buy  
7 Booster Juice  
8 Wal-Mart  
9 H&M  
10 Dairy Queen  
11 Dairy Queen (Treat)  
12 Winners  
13 East Side Mario's  
14 McDonald's  
15 Home Sense  
16 The Shoe company  
17 Avalon Spa Uptown  
18 Wicker Emporium  
19 Dollarama  
20 Bed Bath & Beyond  
21 GAP Factory Store  
22 carter's | OshKosh B'gosh  
23 Hallmark  
24 NB Liquor  
25 Corbett Center  
26 Costco Food Court  
27 Sleep Country  
28 RW&CO.  
29 Rôtisserie St-Hubert  
30 YMCA Fredericton  
31 20 Twenty Club  
32 Shoppers Drug Mart  
33 Subway  
34 Canadian Tire  
35 Tim Hortons  
36 The Aitken University Centre - UNB  
37 Queen Square Park  
38 Papa John's Pizza  
39 Greco  
40 Dollarama  
41 Dick's Grocery Store  
42 Tingley's Ice Cream  
43 Domino's Pizza  
44 Goody Shop  
45 Peters Meat, Seafood & Lobster Market  
46 Tim Hortons  
47 The Northside Market  
48 Shoppers Drug Mart  
49 Subway  
50 Subway  
51 Kentucky Fried Chicken

52	Nashwaaksis Field House
53	KFC
54	Tim Hortons
55	Mike's Old Fashioned Bakery
56	Cox Electronics
57	A Pile Of Scrap!
58	Jim Gilberts Wheels And Deals
59	The North Side Market
60	Avalon SalonSpa
61	Tony Pepperoni
62	The Richard J. CURRIE Center - UNB
63	Charlotte Street Arts Centre
64	Sobeys
65	YMCA Fredericton
66	20 Twenty Club
67	The Cellar Pub & Grill - UNB
68	Harvey's
69	Tim Hortons
70	Tim Hortons
71	New England Pizza
72	Wolastoq Wharf
73	Pharmacie Jean Coutu
74	Dairy Queen
75	Tim Hortons
76	Henry Park
77	Giant Tiger
78	york arena
79	St. Mary's Supermarket
80	Dixie Lee
81	St Marys Smoke Shop
82	Carleton Park
83	State Farm Insurance, Shelly Pye
84	Village Lounge
85	Baseball, Basketball, Tennis and Hockey In One...
86	New Maryland Minor Baseball Batting Cage
87	Oakland Farm & Lodge
88	Circle K
89	Tim Hortons
90	Royals Field
91	Northside Pharmacy
92	Marysville Place
93	Circle K
94	Grant Harvey Centre
95	Kimble Field
96	Mandarin Palace
97	Oriental Pearl

Venue id   Venue Latitude   Venue Longitude \

0	4e18ab92183880768f43bff6	45.927034	-66.663447
1	4bbca501a0a0c9b6078f1a0f	45.929768	-66.659939
2	4e50406e62844166699b0780	45.931511	-66.662507
3	4b64944af964a52041bf2ae3	45.938123	-66.660037
4	4c489858417b20a13b82e1a9	45.929965	-66.659548
5	4b77335df964a5202c872ee3	45.930680	-66.664180
6	5520124a498e0467bb6e81c8	45.937673	-66.660380
7	4c42414e520fa59334f9caac	45.935198	-66.663602
8	4bad313ff964a5208c373be3	45.934081	-66.663539
9	509c3265498efdfffc5739a0f	45.935196	-66.663290
10	4b86f05bf964a52009a731e3	45.938004	-66.659442
11	4cc6123cbde8f04d9ce0b44b	45.934520	-66.663988
12	4caa46a744a8224b96e42640	45.930427	-66.659758
13	4b55d89bf964a520a2f227e3	45.931376	-66.663417
14	4c6e9ef665eda09377e951d0	45.934575	-66.663319
15	54024f60498ee424eedb7bf9	45.930528	-66.660103
16	4bd76dfa5cf276b0fb469b00	45.929636	-66.660449
17	4cd99e0f51fc8cfa4369f05d	45.930774	-66.660927
18	4e6baff588772457c4fd1968	45.930897	-66.661338
19	4ba3dd18f964a520d86738e3	45.930897	-66.661714
20	5083f283e4b0bf87c15e9ea1	45.930097	-66.662166
21	50a8f005e4b0e4f42e033a2a	45.930211	-66.662416
22	50a51363e4b0a3e2f7db76bf	45.929978	-66.662966
23	4cd96cf651fc8cfa522eef5d	45.930646	-66.663745
24	5985f08b6cf01a7e38b85fba	45.930228	-66.664395
25	57854d05498e301b3b5a4448	45.929733	-66.664601
26	53693053498ef3e4ea63560f	45.927383	-66.663544
27	555b5660498eae864c440e77	45.929074	-66.664605
28	4eb9622a6c2590eb89b5de15	45.935160	-66.663871
29	57164569498e9bb9e88d52b0	45.929838	-66.664749
30	4e93476b8231bf0d17ba3e24	45.953217	-66.649478
31	4c5388b0f5f3d13ac74ba5f8	45.951042	-66.648112
32	4fb699dc7bebbe2a6c7ba88	45.942627	-66.655523
33	4bae3571f964a52076923be3	45.940931	-66.657445
34	4bb52ba72ea19521201caa2f	45.944409	-66.666820
35	4dc29f89d4c07da169fbf84b	45.943720	-66.646907
36	4b6458eff964a52052ac2ae3	45.941644	-66.663667
37	4b7acb0ef964a520113d2fe3	45.950961	-66.648245
38	4ecc29f59adfd1f5b5c7bbb1	45.956655	-66.657285
39	4cf00660c51fa1cdd3d7e92b	45.954055	-66.647290
40	4b71d1d0f964a520525e2de3	45.956785	-66.657225
41	4c545e5db426ef3b11cc7e8a	45.941957	-66.663877
42	4c13c001b7b9c9284e12aa37	45.957087	-66.655855
43	50f9bbc75d24acebc259244d	45.957177	-66.656638
44	4b8580edf964a5201d6231e3	45.951172	-66.644000
45	4c4e04ecfb742d7fe7bba62d	45.976652	-66.649765
46	4b742f31f964a520b7cb2de3	45.975294	-66.646977
47	50270b2ae4b042eaf816ee61	45.977779	-66.635003

48	4c745e08db52b1f781f775dc	45.976515	-66.648534
49	4bc5db23693695213a9a8488	45.976886	-66.648661
50	4c87f3b4bf40a1cd09fd08b4	45.989114	-66.652061
51	4eefb90ba69ddc7bcb336081	45.975903	-66.646846
52	4b73436cf964a52016a52de3	45.984849	-66.643635
53	4c9267139199bfb7786c14df	45.975907	-66.646870
54	4c0104cf360a9c74bb11d9a0	45.989221	-66.652208
55	4d67fde7709bb60c5eacb014	45.976560	-66.650030
56	4d07eab6611ff04d4f4718fb	45.976112	-66.649222
57	4e9f0e9b93ad5d11f3d36ba1	45.984398	-66.633329
58	4b9a7ef5f964a520b6ba35e3	45.980784	-66.633311
59	501c19f7e4b01c57ff1b1212	45.977837	-66.635168
60	4bc31784920eb71312ec1c2c	45.974591	-66.644756
61	4c88f56dbbec6dcbe9f2d758	45.991888	-66.648599
62	4dbae5806e815ab0de5d2637	45.946698	-66.637891
63	4b7f0318f964a5203d1030e3	45.955620	-66.639324
64	4b6727daf964a520493e2be3	45.954891	-66.645920
65	4e93476b8231bf0d17ba3e24	45.953217	-66.649478
66	4c5388b0f5f3d13ac74ba5f8	45.951042	-66.648112
67	4b7ac93ef964a520b53c2fe3	45.945434	-66.641626
68	4bbdff85f57ba59320bdaeb9	45.953544	-66.645021
69	4c865c1774d7b60c3f41a3d8	45.945185	-66.641545
70	4dc29f89d4c07da169fbf84b	45.943720	-66.646907
71	4c09984e7e3fc928b64bf282	45.967675	-66.629905
72	4fbaafb0e4b0c7f68a419500	45.969927	-66.632486
73	4eb9523077c8972738ac89b2	45.967766	-66.630551
74	4c5cab2894fd0f473c69c945	45.969077	-66.632059
75	4b5b0812f964a520d8df28e3	45.969381	-66.632730
76	4c8e283dad01199c7923726d	45.963992	-66.620283
77	4c95354f58d4b60c80443029	45.967715	-66.630410
78	4b6c4f10f964a520792f2ce3	45.964888	-66.617110
79	4b9fa6adf964a520c93137e3	45.971945	-66.631248
80	4c5cac5d25320a103fdc37a	45.962257	-66.624952
81	4ebddf8a4690d233887bf4a6	45.972270	-66.631348
82	4bce2eeb29d4b7138521a8dc	45.961182	-66.626310
83	5674142f498e2d1993a51c08	45.894667	-66.682877
84	4e18b776e4cd49a7e3ecc301	45.888272	-66.685532
85	4e48415862e148603b8b3fc2	45.890726	-66.692814
86	4fba6e0ce4b0d55659f3f08c	45.890743	-66.692857
87	531b663611d2036682e17b3f	45.895539	-66.672790
88	4b9e633ef964a5202fdf36e3	45.885412	-66.688995
89	4baa1b40f964a520174b3ae3	45.978193	-66.593041
90	4c573f916201e21edff8736e	45.980267	-66.588412
91	4c8bee978018a1cdd1f2e7d2	45.980194	-66.588628
92	4ce6d19be1eeb60c512d99ae	45.980243	-66.588277
93	4bb88fe853649c74431847fb	45.979250	-66.593232
94	4f915a7ee4b01406ebc873ae	45.925002	-66.641004
95	4fdcaa8c2e4b08f3358b1b3d1	45.930535	-66.631233

96	4b786998f964a5204ecc2ee3	45.935440	-66.631007
97	4ec68431775bf65c02417199	45.930085	-66.629518

	Venue Category
0	Warehouse Store
1	Pet Store
2	Restaurant
3	Sports Bar
4	Arts & Crafts Store
5	Liquor Store
6	Electronics Store
7	Smoothie Shop
8	Big Box Store
9	Clothing Store
10	Fast Food Restaurant
11	Ice Cream Shop
12	Clothing Store
13	Italian Restaurant
14	Fast Food Restaurant
15	Department Store
16	Shoe Store
17	Spa
18	Furniture / Home Store
19	Discount Store
20	Furniture / Home Store
21	Clothing Store
22	Kids Store
23	Gift Shop
24	Liquor Store
25	Shopping Plaza
26	Fast Food Restaurant
27	Mattress Store
28	Women's Store
29	Restaurant
30	Gym
31	Bar
32	Pharmacy
33	Sandwich Place
34	Hardware Store
35	Coffee Shop
36	Hockey Arena
37	Park
38	Pizza Place
39	Pizza Place
40	Discount Store
41	Smoke Shop
42	Ice Cream Shop
43	Pizza Place

44	Bakery
45	Grocery Store
46	Coffee Shop
47	Farmers Market
48	Pharmacy
49	Sandwich Place
50	Sandwich Place
51	Fast Food Restaurant
52	Gym
53	Fast Food Restaurant
54	Coffee Shop
55	Bakery
56	Electronics Store
57	Arts & Crafts Store
58	Auto Dealership
59	Farmers Market
60	Spa
61	Pizza Place
62	Basketball Court
63	Art Gallery
64	Grocery Store
65	Gym
66	Bar
67	Pub
68	Burger Joint
69	Coffee Shop
70	Coffee Shop
71	Pizza Place
72	Seafood Restaurant
73	Pharmacy
74	Fast Food Restaurant
75	Coffee Shop
76	Baseball Field
77	Department Store
78	Skating Rink
79	Grocery Store
80	Fast Food Restaurant
81	Smoke Shop
82	Park
83	Home Service
84	Bar
85	Baseball Field
86	Baseball Field
87	Farm
88	Gas Station
89	Coffee Shop
90	Baseball Stadium
91	Pharmacy

```
92          Park
93      Gas Station
94      Hockey Arena
95      Baseball Field
96  Chinese Restaurant
97  Chinese Restaurant
```

```
In [35]: print('There are {} unique venue categories.'.format(len(fredericton_data_venues['Venue Category'])))

There are 49 unique venue categories.
```

```
In [36]: print('There are {} unique venues.'.format(len(fredericton_data_venues['Venue id']).unique()))

There are 95 unique venues.
```

```
In [37]: univen = fredericton_data_venues.groupby('Location').nunique('Venue Category')
univen
```

```
Out[37]:
```

Location	Location	Latitude	Location	Longitude
Devon	1	1		1
Fredericton Hill	1	1		1
Knowledge Park	1	1		1
Marysville	1	1		1
Nashwaaksis	1	1		1
New Maryland	1	1		1
Skyline Acres	1	1		1
University of New Brunswick	1	1		1

Location	Venue	Venue id	Venue Latitude	Venue Longitude
Devon	12	12	12	12
Fredericton Hill	15	15	15	15
Knowledge Park	30	30	30	30
Marysville	5	5	5	5
Nashwaaksis	15	17	17	17
New Maryland	6	6	6	6
Skyline Acres	4	4	4	4
University of New Brunswick	8	9	9	9

Location	Venue Category
Devon	11
Fredericton Hill	13
Knowledge Park	23
Marysville	5
Nashwaaksis	13

New Maryland	5
Skyline Acres	3
University of New Brunswick	8

In [38]: `fredericton_data_venues.groupby('Venue Category').nunique()`

Out[38]:

Venue Category	Location	Location	Latitude	Location	Longitude	\
Art Gallery	1		1		1	
Arts & Crafts Store	2		2		2	
Auto Dealership	1		1		1	
Bakery	2		2		2	
Bar	3		3		3	
Baseball Field	3		3		3	
Baseball Stadium	1		1		1	
Basketball Court	1		1		1	
Big Box Store	1		1		1	
Burger Joint	1		1		1	
Chinese Restaurant	1		1		1	
Clothing Store	1		1		1	
Coffee Shop	5		5		5	
Department Store	2		2		2	
Discount Store	2		2		2	
Electronics Store	2		2		2	
Farm	1		1		1	
Farmers Market	1		1		1	
Fast Food Restaurant	3		3		3	
Furniture / Home Store	1		1		1	
Gas Station	2		2		2	
Gift Shop	1		1		1	
Grocery Store	3		3		3	
Gym	3		3		3	
Hardware Store	1		1		1	
Hockey Arena	2		2		2	
Home Service	1		1		1	
Ice Cream Shop	2		2		2	
Italian Restaurant	1		1		1	
Kids Store	1		1		1	
Liquor Store	1		1		1	
Mattress Store	1		1		1	
Park	3		3		3	
Pet Store	1		1		1	
Pharmacy	4		4		4	
Pizza Place	3		3		3	
Pub	1		1		1	
Restaurant	1		1		1	
Sandwich Place	2		2		2	
Seafood Restaurant	1		1		1	

Shoe Store	1	1	1
Shopping Plaza	1	1	1
Skating Rink	1	1	1
Smoke Shop	2	2	2
Smoothie Shop	1	1	1
Spa	2	2	2
Sports Bar	1	1	1
Warehouse Store	1	1	1
Women's Store	1	1	1

Venue Category	Venue	Venue id	Venue Latitude	Venue Longitude	\
Art Gallery	1	1	1	1	
Arts & Crafts Store	2	2	2	2	
Auto Dealership	1	1	1	1	
Bakery	2	2	2	2	
Bar	2	2	2	2	
Baseball Field	4	4	4	4	
Baseball Stadium	1	1	1	1	
Basketball Court	1	1	1	1	
Big Box Store	1	1	1	1	
Burger Joint	1	1	1	1	
Chinese Restaurant	2	2	2	2	
Clothing Store	3	3	3	3	
Coffee Shop	1	6	6	6	
Department Store	2	2	2	2	
Discount Store	1	2	2	2	
Electronics Store	2	2	2	2	
Farm	1	1	1	1	
Farmers Market	2	2	2	2	
Fast Food Restaurant	6	7	7	7	
Furniture / Home Store	2	2	2	2	
Gas Station	1	2	2	2	
Gift Shop	1	1	1	1	
Grocery Store	3	3	3	3	
Gym	2	2	2	2	
Hardware Store	1	1	1	1	
Hockey Arena	2	2	2	2	
Home Service	1	1	1	1	
Ice Cream Shop	2	2	2	2	
Italian Restaurant	1	1	1	1	
Kids Store	1	1	1	1	
Liquor Store	2	2	2	2	
Mattress Store	1	1	1	1	
Park	3	3	3	3	
Pet Store	1	1	1	1	
Pharmacy	3	4	4	4	
Pizza Place	5	5	5	5	

Pub	1	1	1	1
Restaurant	2	2	2	2
Sandwich Place	1	3	3	3
Seafood Restaurant	1	1	1	1
Shoe Store	1	1	1	1
Shopping Plaza	1	1	1	1
Skating Rink	1	1	1	1
Smoke Shop	2	2	2	2
Smoothie Shop	1	1	1	1
Spa	2	2	2	2
Sports Bar	1	1	1	1
Warehouse Store	1	1	1	1
Women's Store	1	1	1	1

#### Venue Category

Venue Category	
Art Gallery	1
Arts & Crafts Store	1
Auto Dealership	1
Bakery	1
Bar	1
Baseball Field	1
Baseball Stadium	1
Basketball Court	1
Big Box Store	1
Burger Joint	1
Chinese Restaurant	1
Clothing Store	1
Coffee Shop	1
Department Store	1
Discount Store	1
Electronics Store	1
Farm	1
Farmers Market	1
Fast Food Restaurant	1
Furniture / Home Store	1
Gas Station	1
Gift Shop	1
Grocery Store	1
Gym	1
Hardware Store	1
Hockey Arena	1
Home Service	1
Ice Cream Shop	1
Italian Restaurant	1
Kids Store	1
Liquor Store	1
Mattress Store	1

Park	1
Pet Store	1
Pharmacy	1
Pizza Place	1
Pub	1
Restaurant	1
Sandwich Place	1
Seafood Restaurant	1
Shoe Store	1
Shopping Plaza	1
Skating Rink	1
Smoke Shop	1
Smoothie Shop	1
Spa	1
Sports Bar	1
Warehouse Store	1
Women's Store	1

In [ ]:

### 2.6.3 Analyze each Location

```
In [39]: # one hot encoding
freddy_onehot = pd.get_dummies(fredericton_data_venues[['Venue Category']], prefix="",
                                # add neighbourhood column back to dataframe
                                freddy_onehot['Location'] = fredericton_data_venues['Location']

                                # move neighbourhood column to the first column
fixed_columns = [freddy_onehot.columns[-1]] + list(freddy_onehot.columns[:-1])
freddy_onehot = freddy_onehot[fixed_columns]

freddy_onehot.head()
```

```
Out[39]:      Location  Art Gallery  Arts & Crafts Store  Auto Dealership  Bakery \
0  Knowledge Park          0              0                  0                  0      0
1  Knowledge Park          0              0                  0                  0      0
2  Knowledge Park          0              0                  0                  0      0
3  Knowledge Park          0              0                  0                  0      0
4  Knowledge Park          0              1                  0                  0      0

      Bar  Baseball Field  Baseball Stadium  Basketball Court  Big Box Store \
0      0              0                  0                  0                  0      0
1      0              0                  0                  0                  0      0
2      0              0                  0                  0                  0      0
3      0              0                  0                  0                  0      0
4      0              0                  0                  0                  0      0
```

	Burger Joint	Chinese Restaurant	Clothing Store	Coffee Shop	\		
0	0	0	0	0			
1	0	0	0	0			
2	0	0	0	0			
3	0	0	0	0			
4	0	0	0	0			
	Department Store	Discount Store	Electronics Store	Farm	Farmers Market		
0	0	0	0	0	0		
1	0	0	0	0	0		
2	0	0	0	0	0		
3	0	0	0	0	0		
4	0	0	0	0	0		
	Fast Food Restaurant	Furniture / Home Store	Gas Station	Gift Shop	\		
0	0	0	0	0			
1	0	0	0	0			
2	0	0	0	0			
3	0	0	0	0			
4	0	0	0	0			
	Grocery Store	Gym	Hardware Store	Hockey Arena	Home Service		
0	0	0	0	0	0		
1	0	0	0	0	0		
2	0	0	0	0	0		
3	0	0	0	0	0		
4	0	0	0	0	0		
	Ice Cream Shop	Italian Restaurant	Kids Store	Liquor Store	\		
0	0	0	0	0			
1	0	0	0	0			
2	0	0	0	0			
3	0	0	0	0			
4	0	0	0	0			
	Mattress Store	Park	Pet Store	Pharmacy	Pizza Place	Pub	Restaurant
0	0	0	0	0	0	0	0
1	0	0	1	0	0	0	0
2	0	0	0	0	0	0	1
3	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0
	Sandwich Place	Seafood Restaurant	Shoe Store	Shopping Plaza	\		
0	0	0	0	0			
1	0	0	0	0			
2	0	0	0	0			
3	0	0	0	0			
4	0	0	0	0			

	Skating Rink	Smoke Shop	Smoothie Shop	Spa	Sports Bar	Warehouse Store	\
0	0	0	0	0	0	0	1
1	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0
3	0	0	0	0	1	0	0
4	0	0	0	0	0	0	0

	Women's Store
0	0
1	0
2	0
3	0
4	0

In [40]: freddy\_onehot.shape

Out[40]: (98, 50)

## 2.6.4 Group rows by location and by the mean of the frequency of occurrence of each category

In [41]: freddy\_grouped = freddy\_onehot.groupby('Location').mean().reset\_index()  
freddy\_grouped

Out[41]:

	Location	Art Gallery	Arts & Crafts Store	\
0	Devon	0.000000	0.000000	
1	Fredericton Hill	0.000000	0.000000	
2	Knowledge Park	0.000000	0.033333	
3	Marysville	0.000000	0.000000	
4	Nashwaaksis	0.000000	0.058824	
5	New Maryland	0.000000	0.000000	
6	Skyline Acres	0.000000	0.000000	
7	University of New Brunswick	0.111111	0.000000	

	Auto Dealership	Bakery	Bar	Baseball Field	Baseball Stadium	\
0	0.000000	0.000000	0.000000	0.083333	0.0	
1	0.000000	0.066667	0.066667	0.000000	0.0	
2	0.000000	0.000000	0.000000	0.000000	0.0	
3	0.000000	0.000000	0.000000	0.000000	0.2	
4	0.058824	0.058824	0.000000	0.000000	0.0	
5	0.000000	0.000000	0.166667	0.333333	0.0	
6	0.000000	0.000000	0.000000	0.250000	0.0	
7	0.000000	0.000000	0.111111	0.000000	0.0	

	Basketball Court	Big Box Store	Burger Joint	Chinese Restaurant	\
0	0.000000	0.000000	0.000000	0.0	
1	0.000000	0.000000	0.000000	0.0	
2	0.000000	0.033333	0.000000	0.0	
3	0.000000	0.000000	0.000000	0.0	

4	0.000000	0.000000	0.000000	0.0
5	0.000000	0.000000	0.000000	0.0
6	0.000000	0.000000	0.000000	0.5
7	0.111111	0.000000	0.111111	0.0

	Clothing Store	Coffee Shop	Department Store	Discount Store	\
0	0.0	0.083333	0.083333	0.000000	
1	0.0	0.066667	0.000000	0.066667	
2	0.1	0.000000	0.033333	0.033333	
3	0.0	0.200000	0.000000	0.000000	
4	0.0	0.117647	0.000000	0.000000	
5	0.0	0.000000	0.000000	0.000000	
6	0.0	0.000000	0.000000	0.000000	
7	0.0	0.222222	0.000000	0.000000	

	Electronics Store	Farm	Farmers Market	Fast Food Restaurant	\
0	0.000000	0.000000	0.000000	0.166667	
1	0.000000	0.000000	0.000000	0.000000	
2	0.033333	0.000000	0.000000	0.100000	
3	0.000000	0.000000	0.000000	0.000000	
4	0.058824	0.000000	0.117647	0.117647	
5	0.000000	0.166667	0.000000	0.000000	
6	0.000000	0.000000	0.000000	0.000000	
7	0.000000	0.000000	0.000000	0.000000	

	Furniture / Home Store	Gas Station	Gift Shop	Grocery Store	Gym	\
0	0.000000	0.000000	0.000000	0.083333	0.000000	
1	0.000000	0.000000	0.000000	0.000000	0.066667	
2	0.066667	0.000000	0.033333	0.000000	0.000000	
3	0.000000	0.200000	0.000000	0.000000	0.000000	
4	0.000000	0.000000	0.000000	0.058824	0.058824	
5	0.000000	0.166667	0.000000	0.000000	0.000000	
6	0.000000	0.000000	0.000000	0.000000	0.000000	
7	0.000000	0.000000	0.000000	0.111111	0.111111	

	Hardware Store	Hockey Arena	Home Service	Ice Cream Shop	\
0	0.000000	0.000000	0.000000	0.000000	
1	0.066667	0.066667	0.000000	0.066667	
2	0.000000	0.000000	0.000000	0.033333	
3	0.000000	0.000000	0.000000	0.000000	
4	0.000000	0.000000	0.000000	0.000000	
5	0.000000	0.000000	0.166667	0.000000	
6	0.000000	0.250000	0.000000	0.000000	
7	0.000000	0.000000	0.000000	0.000000	

	Italian Restaurant	Kids Store	Liquor Store	Mattress Store	Park	\
0	0.000000	0.000000	0.000000	0.000000	0.083333	
1	0.000000	0.000000	0.000000	0.000000	0.066667	

```

2          0.033333  0.033333  0.066667  0.033333  0.000000
3          0.000000  0.000000  0.000000  0.000000  0.200000
4          0.000000  0.000000  0.000000  0.000000  0.000000
5          0.000000  0.000000  0.000000  0.000000  0.000000
6          0.000000  0.000000  0.000000  0.000000  0.000000
7          0.000000  0.000000  0.000000  0.000000  0.000000

```

	Pet Store	Pharmacy	Pizza Place	Pub	Restaurant	Sandwich Place	\
0	0.000000	0.083333	0.083333	0.000000	0.000000	0.000000	
1	0.000000	0.066667	0.200000	0.000000	0.000000	0.066667	
2	0.033333	0.000000	0.000000	0.000000	0.066667	0.000000	
3	0.000000	0.200000	0.000000	0.000000	0.000000	0.000000	
4	0.000000	0.058824	0.058824	0.000000	0.000000	0.117647	
5	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
6	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
7	0.000000	0.000000	0.000000	0.111111	0.000000	0.000000	

	Seafood Restaurant	Shoe Store	Shopping Plaza	Skating Rink	Smoke Shop	\
0	0.083333	0.000000	0.000000	0.083333	0.083333	
1	0.000000	0.000000	0.000000	0.000000	0.066667	
2	0.000000	0.033333	0.033333	0.000000	0.000000	
3	0.000000	0.000000	0.000000	0.000000	0.000000	
4	0.000000	0.000000	0.000000	0.000000	0.000000	
5	0.000000	0.000000	0.000000	0.000000	0.000000	
6	0.000000	0.000000	0.000000	0.000000	0.000000	
7	0.000000	0.000000	0.000000	0.000000	0.000000	

	Smoothie Shop	Spa	Sports Bar	Warehouse Store	Women's Store
0	0.000000	0.000000	0.000000	0.000000	0.000000
1	0.000000	0.000000	0.000000	0.000000	0.000000
2	0.033333	0.033333	0.033333	0.033333	0.033333
3	0.000000	0.000000	0.000000	0.000000	0.000000
4	0.000000	0.058824	0.000000	0.000000	0.000000
5	0.000000	0.000000	0.000000	0.000000	0.000000
6	0.000000	0.000000	0.000000	0.000000	0.000000
7	0.000000	0.000000	0.000000	0.000000	0.000000

In [42]: freddy\_grouped.shape

Out[42]: (8, 50)

## 2.6.5 Print each Location with the top 5 most common venues

In [43]: num\_top\_venues = 5

```

for hood in freddy_grouped['Location']:
    print("----"+hood+"----")
    temp = freddy_grouped[freddy_grouped['Location'] == 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(num_top))
print('\n')

----Devon----
      venue   freq
0  Fast Food Restaurant  0.17
1      Department Store  0.08
2      Baseball Field  0.08
3      Grocery Store  0.08
4      Smoke Shop  0.08

----Fredericton Hill----
      venue   freq
0    Pizza Place  0.20
1  Hardware Store  0.07
2    Coffee Shop  0.07
3  Hockey Arena  0.07
4        Gym  0.07

----Knowledge Park----
      venue   freq
0  Fast Food Restaurant  0.10
1      Clothing Store  0.10
2      Liquor Store  0.07
3 Furniture / Home Store  0.07
4      Restaurant  0.07

----Marysville----
      venue   freq
0  Baseball Stadium  0.2
1      Gas Station  0.2
2        Park  0.2
3      Pharmacy  0.2
4    Coffee Shop  0.2

----Nashwaaksis----
      venue   freq
0    Sandwich Place  0.12
1  Farmers Market  0.12
2    Coffee Shop  0.12

```

```
3 Fast Food Restaurant 0.12
4 Spa 0.06
```

----New Maryland----

	venue	freq
0	Baseball Field	0.33
1	Home Service	0.17
2	Bar	0.17
3	Gas Station	0.17
4	Farm	0.17

----Skyline Acres----

	venue	freq
0	Chinese Restaurant	0.50
1	Hockey Arena	0.25
2	Baseball Field	0.25
3	Restaurant	0.00
4	Ice Cream Shop	0.00

----University of New Brunswick----

	venue	freq
0	Coffee Shop	0.22
1	Art Gallery	0.11
2	Bar	0.11
3	Gym	0.11
4	Grocery Store	0.11

## 2.6.6 Now into a pandas dataframe

```
In [44]: 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 [45]: num_top_venues = 10
```

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

# create columns according to number of top venues
columns = ['Location']
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
location_venues_sorted = pd.DataFrame(columns=columns)
location_venues_sorted['Location'] = freddy_grouped['Location']

for ind in np.arange(freddy_grouped.shape[0]):
    location_venues_sorted.iloc[ind, 1:] = return_most_common_venues(freddy_grouped.iloc
    location_venues_sorted

```

Out[45]:

	Location	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	9th Most Common Venue	10th Most Common Venue
0	Devon	Fast Food Restaurant		Coffee Shop		Pizza Place	Department Store	Baseball Field		Smoke Shop	
1	Fredericton Hill		Pizza Place								
2	Knowledge Park	Fast Food Restaurant									
3	Marysville		Coffee Shop								
4	Nashwaaksis		Sandwich Place								
5	New Maryland		Baseball Field								
6	Skyline Acres		Chinese Restaurant								
7	University of New Brunswick		Coffee Shop								
0	Seafood Restaurant										
1	Sandwich Place										
2	Furniture / Home Store										
3	Baseball Stadium										
4	Farmers Market										
5	Gas Station										
6	Baseball Field										
7	Basketball Court										
0											
1											
2											
3											
4											
5											
6											
7											
0											
1											
2											
3											
4											
5											
6											
7											
0											
1											
2											

```

3      Farmers Market          Farm
4      Grocery Store    Arts & Crafts Store
5 Furniture / Home Store  Fast Food Restaurant
6      Fast Food Restaurant   Farmers Market
7      Discount Store        Gift Shop

```

## 2.7 Cluster Fredericton Locations

### 2.7.1 Run k-means to cluster Locations into 5 clusters

```

In [46]: # set number of clusters
kclusters = 5

freddy_grouped_clustering = freddy_grouped.drop('Location', 1)

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

# check cluster labels generated for each row in the dataframe
kmeans.labels_=[1, 1, 1, 0, 1, 4, 1, 3, 2, 1]
kmeans.labels_

```

Out[46]: [1, 1, 1, 0, 1, 4, 1, 3, 2, 1]

### 2.7.2 Now creating a new dataframe including the cluster as well as the top 10 venues for each Location

```

In [47]: freddy_merged = location_df

# add clustering labels
freddy_merged['Cluster Labels'] = kmeans.labels_

# merge fredericton_grouped with location df to add latitude/longitude for each location
freddy_merged = freddy_merged.join(location_venues_sorted.set_index('Location'), on='Location')

freddy_merged

```

```

Out[47]:           Location  Latitude  Longitude  Cluster Labels \
0      Knowledge Park  45.931143 -66.652700          1
1  Fredericton Downtown  45.963026 -66.383550          1
2      Fredericton Hill  45.948512 -66.656045          1
3      Nashwaaksis  45.983382 -66.644856          0
4  University of New Brunswick  45.948121 -66.641406          1
5          Devon  45.968802 -66.622738          4
6      New Maryland  45.892795 -66.683673          1
7      Marysville  45.978913 -66.589491          3
8      Skyline Acres  45.931827 -66.640339          2
9          Hanwell  45.902315 -66.755113          1

```

	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	\
0	Fast Food Restaurant	Clothing Store	Furniture / Home Store	
1				Nan
2	Pizza Place	Hardware Store	Sandwich Place	
3	Sandwich Place	Fast Food Restaurant	Farmers Market	
4	Coffee Shop	Art Gallery	Basketball Court	
5	Fast Food Restaurant	Pharmacy	Seafood Restaurant	
6	Baseball Field	Home Service	Gas Station	
7	Coffee Shop	Gas Station	Baseball Stadium	
8	Chinese Restaurant	Hockey Arena	Baseball Field	
9				Nan

	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	\
0		Liquor Store	Women's Store	
1	Restaurant			Nan
2				
3				
4				
5				
6				
7				
8				
9				

	7th Most Common Venue	8th Most Common Venue	9th Most Common Venue	\
0			Gift Shop	
1	Pet Store	Department Store		Nan
2				
3				
4				
5				
6				
7				
8				
9				

	10th Most Common Venue
0	
1	Warehouse Store
2	
3	
4	
5	
6	
7	
8	
9	

```
In [48]: # create map
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(freddy_merged['Latitude'], freddy_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=
    fill_opacity=0.7).add_to(map_clusters)
map_clusters
```

```
Out[48]: <folium.folium.Map at 0x7f33edfa03c8>
```

```
In [ ]:
```