Battle of Neighborhoods: Where to Live in Calgary?

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1. Description of the Problem and Discussion of the Background

Week 1: Introduction Section

I chose to work on a rather personal question that I've been asking myself during the past few months. Therefore, you will find this introduction section somewhat less-technical than the rest of the sections in this project. I immigrated to Canada 4 years ago, in 2015. I did my Masters at the University of Alberta, located in Edmonton. I did it in Geotechnical Engineering, specialized in Reservoir Geomechanics.

I love Edmonton, is a city full of parks, outdoors activities, festivals, and awesome landscapes. Nonetheless, the majority of the Oil & Gas Companies have their headquarters down in Calgary, and they are my main target when I am searching for a suitable job position. This is the main reason I find necessary to move to that city.

During the course of this final project, I will be Scraping some information from the different Calgary's neighborhoods. Classifying them in accordance with my personal needs and taste and finding a proper place to move, in case is needed for a future job position.

1. Description of the Data and Problem Solving Methodology

DATA SET: CALGARY NEIGHBORHOODS

Obtained from the URL: https://en.wikipedia.org/wiki/List_of_neighbourhoods_in_Calgary

The Data Base chosen for this project contains the following information from the different neighborhoods in Calgary: Ward, Sector, Type of Neighborhood (Residential, Park, Industrial, Residual Area), Population (@2012), Population Density, and Area in km2.

Additional to the statistical information obtained from Wikipedia, Geographical coordinates (including Latitude and Longitude) from each neighborhood will be added to the Data-Frame, this with the main purpose of serving as valuable information for pulling Venues out of each neighborhood and analyzing the overall profile of each neighborhood.

PROBLEM SOLVING METHODOLOGY

1. Scrape the Neighborhoods information from Wikipedia Data base

2. Build an appropiate Data-Frame with the information

3. Obtain the Geographical Coordinates Information from each Neighborhood

4. Use Foursquare to explore the Venues and build a profile of each Neighborhood

5. Filter the Neighborhoods based on their profile

6. Build graphical representations to facilitate the User Data Analysis and Results Presentation

7. Analysis of Results and Discussion

8. Conclusions form the Study

TARGET AUDIENCE

1. Fellow immigrants thinking on moving to Calgary. This analysis will provide basic but useful information regarding the profile of each Neighborhood in Calgary and might help them to choose the most suitable place for living.

2. Fellow starter Data Scientists, which can find interesting the scope and understandable approach taken during the course of this project, would use it as learning platform and/or consulting data base.

Week 2: Coding Section

In [1]:

```
# Import the Neccesary Libraries and Complements

import pandas as pd
!pip install lxml
!pip install html5lib
```

Requirement already satisfied: lxml in /home/jupyterlab/conda/envs/python/lib/python3.6/site-packages (4.4.0)
Requirement already satisfied: html5lib in /home/jupyterlab/conda/envs/python/lib/python3.6/site-packages (0.9999999)
Requirement already satisfied: six in /home/jupyterlab/conda/envs/python/lib/python3.6/site-packages (from html5lib) (1.12.0)

In [2]:

```
# Wikipedia URL that Contains the Information
URL = 'https://en.wikipedia.org/wiki/List_of_neighbourhoods_in_Calgary'
Table = pd.read_html(URL)
```

In [3]:

```python
# Scrape the information Table from Wikipedia and read it into a DataFrame
calgary = Table[0]
calgary.head()
```

Out[3]:

	Name[9]	Quadrant	Sector[10]	Ward[11]	Type[10]	2012 PopulationRank	Population(2012) [9]
0	Abbeydale	NE/SE	Northeast	10	Residential	82	5917.0
1	Acadia	SE	South	9	Residential	27	10705.0
2	Albert Park/Radisson Heights	SE	East	10	Residential	75	6234.0
3	Altadore	SW	Centre	11	Residential	39	9116.0
4	Alyth/Bonnybrook	SE	Centre	9	Industrial	208	16.0

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In [4]:

```python
# Drop Unnecesary Columns from the Calgary Neighborhoods DataFrame

df_neigh = calgary.drop(['Quadrant', '2012 PopulationRank', 'Population(2011)[9]', '% chan
ge', 'Dwellings(2012)[9]'], axis=1)
df_neigh.head()
```

Out[4]:

	Name[9]	Sector[10]	Ward[11]	Type[10]	Population(2012) [9]	Area(km2) [10]	Populationdens
0	Abbeydale	Northeast	10	Residential	5917.0	1.7	348
1	Acadia	South	9	Residential	10705.0	3.9	274
2	Albert Park/Radisson Heights	East	10	Residential	6234.0	2.5	249
3	Altadore	Centre	11	Residential	9116.0	2.9	314
4	Alyth/Bonnybrook	Centre	9	Industrial	16.0	3.8	

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In [5]:

```
#Rename the Columns for more Clarity
df_calgary = df_neigh.rename(columns={"Name[9]": "Neighborhood", "Sector[10]": "Sector",
'Ward[11]': 'Ward',  'Type[10]': 'Type', 'Population(2012)[9]':'Population', 'Area(km2)[1
0]':'Area (km2)', 'Populationdensity':'Population Density' })
df_calgary.head()
```

Out[5]:

	Neighborhood	Sector	Ward	Type	Population	Area (km2)	Population Density
0	Abbeydale	Northeast	10	Residential	5917.0	1.7	3480.6
1	Acadia	South	9	Residential	10705.0	3.9	2744.9
2	Albert Park/Radisson Heights	East	10	Residential	6234.0	2.5	2493.6
3	Altadore	Centre	11	Residential	9116.0	2.9	3143.4
4	Alyth/Bonnybrook	Centre	9	Industrial	16.0	3.8	4.2

In [6]:

```python
# Clean up DataFrame and leave only information pertaining Residential Neighborhoods

index = df_calgary[df_calgary['Type']=='Industrial'].index
df_calgary.drop(index, inplace=True)
index = df_calgary[df_calgary['Type']=='Major Park'].index
df_calgary.drop(index, inplace=True)
index = df_calgary[df_calgary['Type']=='Residual Area'].index
df_calgary.drop(index, inplace=True)
index = df_calgary[df_calgary['Type']=='Total City of Calgary'].index
df_calgary.drop(index, inplace=True)
df_calgary = df_calgary.reset_index(drop=True)
df_calgary.head(10)
```

Out[6]:

	Neighborhood	Sector	Ward	Type	Population	Area (km2)	Population Density
0	Abbeydale	Northeast	10	Residential	5917.0	1.7	3480.6
1	Acadia	South	9	Residential	10705.0	3.9	2744.9
2	Albert Park/Radisson Heights	East	10	Residential	6234.0	2.5	2493.6
3	Altadore	Centre	11	Residential	9116.0	2.9	3143.4
4	Applewood Park	East	10	Residential	6498.0	1.6	4061.3
5	Arbour Lake	Northwest	2	Residential	10836.0	4.4	2462.7
6	Aspen Woods	West	6	Residential	5271.0	3.8	1387.1
7	Auburn Bay	Southeast	12	Residential	7193.0	4.5	1598.4
8	Banff Trail	Centre	7	Residential	3837.0	1.5	2558
9	Bankview	Centre	8	Residential	5221.0	0.7	7458.6

In [7]:

```python
# Find out the Number of Residential Neighborhoods (7 Characteristics from each one of the
m)
df_calgary.shape
```

Out[7]:

```
(197, 7)
```

In [8]:

```python
# Get the Geographic Coordinates from Calgary's Neighborhoods
# Data was extracted from Geopy Database and manipulated to convert it into a .xlsx File,
 due to Import Issues
# Coordinates DF is a .xlsx File that contains Latitude/Longitude data from all the Neighb
orhoods in df_calgary

coordinates = pd.read_excel ('PythonExport.xlsx', sheet_name = 'Sheet1')
coordinates.head()
```

Out[8]:

	Neighborhood	Latitude	Longitude
0	Abbeydale	51.058836	-113.929413
1	Acadia	51.102527	-110.213738
2	Albert Park/Radisson Heights	51.044845	-113.990195
3	Altadore	51.015104	-114.100756
4	Applewood Park	51.044658	-113.928931

In [9]:

```python
# Merge the DataFrames df_calgary (Neighborhoods Information) with coordinates (Geographic
Information)

Calgary = pd.merge(df_calgary, coordinates, on="Neighborhood")
Calgary.head(10)
```

Out[9]:

	Neighborhood	Sector	Ward	Type	Population	Area (km2)	Population Density	Latitude	Longit
0	Abbeydale	Northeast	10	Residential	5917.0	1.7	3480.6	51.058836	-113.929
1	Acadia	South	9	Residential	10705.0	3.9	2744.9	51.102527	-110.213
2	Albert Park/Radisson Heights	East	10	Residential	6234.0	2.5	2493.6	51.044845	-113.990
3	Altadore	Centre	11	Residential	9116.0	2.9	3143.4	51.015104	-114.100
4	Applewood Park	East	10	Residential	6498.0	1.6	4061.3	51.044658	-113.928
5	Arbour Lake	Northwest	2	Residential	10836.0	4.4	2462.7	51.136786	-114.202
6	Aspen Woods	West	6	Residential	5271.0	3.8	1387.1	51.043119	-114.210
7	Auburn Bay	Southeast	12	Residential	7193.0	4.5	1598.4	50.890605	-113.955
8	Banff Trail	Centre	7	Residential	3837.0	1.5	2558	51.071462	-114.11
9	Bankview	Centre	8	Residential	5221.0	0.7	7458.6	51.033887	-114.099

DATA ANALYSIS: MAPPING CALGARY NEIGHBORHOODS AND START BUILDING THEIR PROFILE USING FOURSQUARE

In [10]:

```python
# Import Additional Analysis Libraries and Complements

import numpy as np # library to handle data in a vectorized manner

import pandas as pd # library for data analsysis
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 the Foursquare API lab
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 # tranform JSON file into a pandas dataframe

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

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

#!conda install -c conda-forge folium=0.5.0 --yes # uncomment this line if you haven't completed the Foursquare API lab
import folium # map rendering library

print('Libraries imported.')
```

```
Solving environment: done


==> WARNING: A newer version of conda exists. <==
  current version: 4.5.11
  latest version: 4.7.11

Please update conda by running

    $ conda update -n base -c defaults conda



## Package Plan ##

  environment location: /home/jupyterlab/conda/envs/python

  added / updated specs:
    - geopy


The following packages will be downloaded:

    package                    |               build
    ---------------------------|-----------------
    certifi-2019.6.16          |              py36_1          149 KB  conda-forge

The following packages will be UPDATED:

    certifi: 2019.6.16-py36_1  anaconda --> 2019.6.16-py36_1  conda-forge

The following packages will be DOWNGRADED:

    openssl: 1.0.2s-h7b6447c_0 anaconda --> 1.0.2r-h14c3975_0 conda-forge


Downloading and Extracting Packages
certifi-2019.6.16    | 149 KB    | ################################### | 10
0%
Preparing transaction: done
Verifying transaction: done
Executing transaction: done
Libraries imported.
```

In [11]:

```python
address = 'Calgary'
geolocator = Nominatim(user_agent="Calgary_explorer")
location = geolocator.geocode(address)
latitude = location.latitude
longitude = location.longitude
print('The geograpical coordinates of Calgary are {}, {}.'.format(latitude, longitude))

# create map of Toronto using latitude and longitude values
map_calgary = folium.Map(location=[latitude, longitude], zoom_start=10)

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

map_calgary
```

The geograpical coordinates of Calgary are 51.02532675, -114.049868485806.

Out[11]:

In [12]:

```python
# Foursquare Credentials and Version

CLIENT_ID = '2KH2YYS0EKOOQL2XHOM4X0UMKFKPJ0LNB3WM21HW1M2BOSTX' # your Foursquare ID
CLIENT_SECRET = '1V53MSBSRLETWJX0FOFZECTBCA2Z12AE2CZ0FDDWTNIN0NQR' # your Foursquare Secret
VERSION = '20190809' # Foursquare API version
```

In [13]:

```python
# Run a function to Obtain the Main Venues within a radius of 1000 m from each Neighbrhood
in Calgary

def getNearbyVenues(names, latitudes, longitudes, radius=1000):

    venues_list=[]
    for name, lat, lng in zip(names, latitudes, longitudes):
        print(name)
        LIMIT = 100 # limit of number of venues returned by Foursquare API
        # create the API request URL
        url = 'https://api.foursquare.com/v2/venues/explore?&client_id={}&client_secret={}
&v={}&ll={},{}&radius={}&limit={}'.format(
            CLIENT_ID,
            CLIENT_SECRET,
            VERSION,
            lat,
            lng,
            radius,
            LIMIT)

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

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

    nearby_venues = pd.DataFrame([item for venue_list in venues_list for item in venue_lis
t])
    nearby_venues.columns = ['Neighborhood',
                  'Neighborhood Latitude',
                  'Neighborhood Longitude',
                  'Venue',
                  'Venue Latitude',
                  'Venue Longitude',
                  'Venue Category']

    return(nearby_venues)
```

In [ ]:

```python
# Store the Venues from each Neighborhood in Calgary into a Separated Data-Frame:

calgary_venues = getNearbyVenues(names= Calgary['Neighborhood'],
                                 latitudes= Calgary['Latitude'],
                                 longitudes= Calgary['Longitude']
                                )
```

In [52]:

```python
# Get an Idea of the Different Venues around 1000 m in every Neighborhood in Calgary

print(calgary_venues.shape)
calgary_venues.head()
```

(4138, 7)

Out[52]:

	Neighborhood	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
0	Abbeydale	51.058836	-113.929413	Subway	51.059215	-113.934836	Sandwich Place
1	Abbeydale	51.058836	-113.929413	Mac's	51.059376	-113.934425	Convenience Store
2	Abbeydale	51.058836	-113.929413	Cave to Castle Property Inspection Inc	51.054379	-113.932812	Home Service
3	Abbeydale	51.058836	-113.929413	Barrio Fiesta	51.052695	-113.935544	Filipino Restaurant
4	Abbeydale	51.058836	-113.929413	Mely's Bakery and Café	51.052672	-113.936031	Café

In [16]:

```python
#Get an Idea of the Different Types of Venues around every Neighborhood in Calgary

print('There are {} unique categories.'.format(len(calgary_venues['Venue Category'].unique())))
```

There are 266 unique categories.

In [17]:

```python
# Analyze each Neighborhood in Calgary, AB
# One hot encoding
calgary_onehot = pd.get_dummies(calgary_venues[['Venue Category']], prefix="", prefix_sep="")

# Add neighborhood column back to dataframe
calgary_onehot['Neighborhood'] = calgary_venues['Neighborhood']

calgary_onehot.head()
```

Out[17]:

	ATM	Accessories Store	African Restaurant	Airport Food Court	Airport Lounge	Airport Service	Airport Terminal	American Restaurant	Argentinian Restaurant	
0	0	0	0	0	0	0	0	0	0	
1	0	0	0	0	0	0	0	0	0	
2	0	0	0	0	0	0	0	0	0	
3	0	0	0	0	0	0	0	0	0	
4	0	0	0	0	0	0	0	0	0	

In [18]:

```python
# Next, let's group rows by neighborhood
# and by taking the mean of the frequency of occurrence of each category

calgary_grouped = calgary_onehot.groupby('Neighborhood').mean().reset_index()
calgary_grouped
```

Out[18]:

	Neighborhood	ATM	Accessories Store	African Restaurant	Airport Food Court	Airport Lounge	Airport Service	A Ter
0	Abbeydale	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
1	Albert Park/Radisson Heights	0.000000	0.000000	0.037037	0.000000	0.000000	0.000000	0.00
2	Altadore	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
3	Applewood Park	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
4	Arbour Lake	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
5	Aspen Woods	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
6	Auburn Bay	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
7	Banff Trail	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
8	Bankview	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
9	Bayview	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
10	Beddington Heights	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
11	Bel-Aire	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
12	Beltline	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
13	Bonavista Downs	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
14	Bowness	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
15	Braeside	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
16	Brentwood	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
17	Bridgeland/Riverside	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
18	Bridlewood	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
19	Britannia	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
20	CFB Currie	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
21	CFB Lincoln Park PMQ	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
22	Cambrian Heights	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
23	Canyon Meadows	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
24	Capitol Hill	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
25	Castleridge	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
26	Cedarbrae	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
27	Chaparral	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
28	Charleswood	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
29	Chinatown	0.000000	0.000000	0.00000	0.000000	0.000000	0.000000	0.00
30	Chinook Park	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
31	Christie Park	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00

	Neighborhood	ATM	Accessories Store	African Restaurant	Airport Food Court	Airport Lounge	Airport Service	A Ter
32	Citadel	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
33	Cityscape[2]	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
34	Cliff Bungalow	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
35	Coach Hill	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
36	Collingwood	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
37	Copperfield	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
38	Coral Springs	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
39	Cougar Ridge	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
40	Country Hills	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
41	Country Hills Village	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
42	Coventry Hills	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
43	Cranston	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
44	Crescent Heights	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
45	Crestmont	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
46	Dalhousie	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
47	Deer Ridge	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
48	Deer Run	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
49	Diamond Cove	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
50	Discovery Ridge	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
51	Douglasdale/Glen	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
52	Dover	0.000000	0.000000	0.000000	0.076923	0.153846	0.153846	0.07
53	Downtown Commercial Core	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
54	Downtown East Village	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
55	Downtown West End	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
56	Eagle Ridge	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
57	Eau Claire	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
58	Edgemont	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
59	Elbow Park	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
60	Elboya	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
61	Erin Woods	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
62	Erlton	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
63	Evanston	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
64	Evergreen	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
65	Fairview	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00

	Neighborhood	ATM	Accessories Store	African Restaurant	Airport Food Court	Airport Lounge	Airport Service	A Ter
66	Falconridge	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
67	Forest Heights	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
68	Forest Lawn	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
69	Glamorgan	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
70	Glenbrook	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
71	Glendale	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
72	Greenview	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
73	Greenwood/Greenbriar	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
74	Hamptons	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
75	Harvest Hills	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
76	Hawkwood	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
77	Haysboro	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
78	Hidden Valley	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
79	Highland Park	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
80	Highwood	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
81	Hillhurst	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
82	Hounsfield Heights/Briar Hill	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
83	Huntington Hills	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
84	Inglewood	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
85	Kelvin Grove	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
86	Killarney/Glengarry	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
87	Kincora	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
88	Kingsland	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
89	Lake Bonavista	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
90	Lakeview	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
91	Lincoln Park	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
92	Lower Mount Royal	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
93	MacEwan Glen	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
94	Mahogany	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
95	Manchester	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
96	Maple Ridge	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
97	Marlborough	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
98	Marlborough Park	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
99	Martindale	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00

	Neighborhood	ATM	Accessories Store	African Restaurant	Airport Food Court	Airport Lounge	Airport Service	A Terr
100	Mayfair	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
101	Mayland Heights	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
102	McKenzie Lake	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
103	McKenzie Towne	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
104	Meadowlark Park	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
105	Midnapore	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
106	Millrise	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
107	Mission	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
108	Monterey Park	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
109	Montgomery	0.000000	0.023256	0.000000	0.000000	0.000000	0.000000	0.00
110	Mount Pleasant	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
111	New Brighton	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
112	Nolan Hill	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
113	North Glenmore Park	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
114	North Haven	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
115	North Haven Upper	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
116	Oakridge	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
117	Ogden	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
118	Palliser	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
119	Panorama Hills	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
120	Parkdale	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
121	Parkhill	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
122	Patterson	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
123	Penbrooke Meadows	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
124	Pineridge	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
125	Point Mckay	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
126	Pump Hill	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
127	Queens Park Village	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
128	Queensland	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
129	Ramsay	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
130	Ranchlands	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
131	Red Carpet	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
132	Redstone	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
133	Renfrew	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
134	Richmond	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00

	Neighborhood	ATM	Accessories Store	African Restaurant	Airport Food Court	Airport Lounge	Airport Service	A Ter
135	Rideau Park	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
136	Riverbend	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
137	Rocky Ridge	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
138	Rosedale	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
139	Rosemont	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
140	Rosscarrock	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
141	Roxboro	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
142	Royal Oak	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
143	Rundle	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
144	Rutland Park	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
145	Saddle Ridge	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
146	Sage Hill	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
147	Sandstone Valley	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
148	Scarboro	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
149	Scarboro/Sunalta West	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
150	Scenic Acres	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
151	Seton	0.034483	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
152	Shaganappi	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
153	Shawnee Slopes	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
154	Shawnessy	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
155	Sherwood	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
156	Signal Hill	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
157	Silver Springs	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
158	Silverado	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
159	Skyview Ranch	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
160	Somerset	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
161	South Calgary	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
162	Southview	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
163	Southwood	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
164	Springbank Hill	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
165	Spruce Cliff	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
166	St. Andrews Heights	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
167	Strathcona Park	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
168	Sunalta	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00

	Neighborhood	ATM	Accessories Store	African Restaurant	Airport Food Court	Airport Lounge	Airport Service	A Ter
169	Sundance	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
170	Sunnyside	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
171	Taradale	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
172	Temple	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
173	Thorncliffe	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
174	Tuscany	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
175	Tuxedo Park	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
176	University Heights	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
177	University of Calgary	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
178	Upper Mount Royal	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
179	Valley Ridge	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
180	Varsity	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
181	Vista Heights	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
182	Walden	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
183	West Hillhurst	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
184	West Springs	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
185	Westgate	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
186	Whitehorn	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
187	Wildwood	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
188	Willow Park	0.000000	0.090909	0.000000	0.000000	0.000000	0.000000	0.00
189	Windsor Park	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
190	Winston Heights/Mountview	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
191	Woodbine	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
192	Woodlands	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
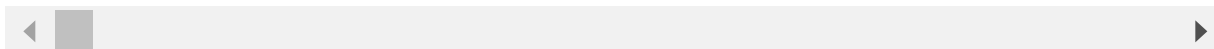
In [19]:

```python
# Calgary 5 Top Venues by each Neighborhood:

num_top_venues = 5

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

```
    ----Abbeydale----
                  venue  freq
0        Sandwich Place   0.2
1     Convenience Store   0.2
2          Home Service   0.2
3                  Café   0.2
4    Filipino Restaurant   0.2


    ----Albert Park/Radisson Heights----
                  venue  freq
0           Pizza Place  0.11
1         Grocery Store  0.07
2      Asian Restaurant  0.07
3        Sandwich Place  0.07
4      Indian Restaurant  0.04


    ----Altadore----
               venue  freq
0            Dog Run  0.23
1               Park  0.15
2      Ice Cream Shop  0.08
3         Coffee Shop  0.08
4        Hockey Rink  0.08


    ----Applewood Park----
                             venue  freq
0                  Warehouse Store  0.25
1                     Liquor Store  0.25
2                      Coffee Shop  0.25
3                             Park  0.25
4    Paper / Office Supplies Store  0.00


    ----Arbour Lake----
                                        venue  freq
0    Residential Building (Apartment / Condo)   0.1
1                       Vietnamese Restaurant   0.1
2                          Convenience Store    0.1
3                                Coffee Shop    0.1
4                     Furniture / Home Store    0.1


    ----Aspen Woods----
                venue  freq
0         Coffee Shop  0.14
1     Asian Restaurant  0.10
2           Restaurant  0.05
3                 Bank  0.05
4    Mexican Restaurant  0.05


    ----Auburn Bay----
                         venue   freq
0    Construction & Landscaping    0.4
```

```
1       Breakfast Spot      0.2
2   Health & Beauty Service 0.2
3           Water Park      0.2
4       Paintball Field     0.0
```

----Banff Trail----

	venue	freq
0	Hotel	0.11
1	Fast Food Restaurant	0.08
2	Coffee Shop	0.05
3	Liquor Store	0.05
4	Park	0.05

----Bankview----

	venue	freq
0	Coffee Shop	0.10
1	Vietnamese Restaurant	0.10
2	Pub	0.08
3	Fast Food Restaurant	0.08
4	Sandwich Place	0.05

----Bayview----

	venue	freq
0	Breakfast Spot	0.2
1	Pub	0.2
2	Other Great Outdoors	0.2
3	Grocery Store	0.2
4	Park	0.2

----Beddington Heights----

	venue	freq
0	Grocery Store	0.12
1	Liquor Store	0.12
2	Coffee Shop	0.08
3	Bank	0.04
4	Sandwich Place	0.04

----Bel-Aire----

	venue	freq
0	Clothing Store	0.15
1	Golf Course	0.08
2	Home Service	0.08
3	Restaurant	0.08
4	Department Store	0.08

----Beltline----

	venue	freq
0	Restaurant	0.07
1	Pub	0.06
2	Bar	0.05
3	Pizza Place	0.04

```
4  Coffee Shop  0.04
```

```
----Bonavista Downs----
                venue  freq
0         Golf Course  0.25
1  Chinese Restaurant  0.25
2     Paintball Field  0.25
3          Astrologer  0.25
4                 ATM  0.00
```

```
----Bowness----
                   venue  freq
0            Coffee Shop  0.22
1                Stadium  0.11
2                   Café  0.11
3     Mexican Restaurant  0.11
4  Vietnamese Restaurant  0.11
```

```
----Braeside----
                 venue  freq
0          Coffee Shop  0.20
1  Fast Food Restaurant  0.13
2     Convenience Store  0.13
3                   Gym  0.07
4              Pharmacy  0.07
```

```
----Brentwood----
                  venue  freq
0        Sandwich Place  0.09
1  Fast Food Restaurant  0.09
2           Coffee Shop  0.09
3            Restaurant  0.05
4         Big Box Store  0.05
```

```
----Bridgeland/Riverside----
                venue  freq
0  Italian Restaurant  0.07
1      Sandwich Place  0.07
2         Coffee Shop  0.07
3        Burger Joint  0.04
4               Diner  0.04
```

```
----Bridlewood----
            venue  freq
0     Coffee Shop  0.20
1  Cosmetics Shop  0.07
2  Sandwich Place  0.07
3       Pet Store  0.07
4        Pharmacy  0.07
```

```
    ----Britannia----
                    venue  freq
0             Dog Run  0.18
1                Park  0.18
2      Ice Cream Shop  0.09
3       Shopping Mall  0.09
4   Food & Drink Shop  0.09



    ----CFB Currie----
                    venue  freq
0         Golf Course  0.14
1            Pharmacy  0.07
2      Sandwich Place  0.07
3   Food & Drink Shop  0.07
4              Bakery  0.07



    ----CFB Lincoln Park PMQ----
                    venue  freq
0         Golf Course  0.14
1            Pharmacy  0.07
2      Sandwich Place  0.07
3   Food & Drink Shop  0.07
4              Bakery  0.07



    ----Cambrian Heights----
                       venue  freq
0                     Pub  0.08
1        Asian Restaurant  0.08
2           Grocery Store  0.08
3                     Gym  0.08
4   Thrift / Vintage Store  0.08



    ----Canyon Meadows----
                     venue  freq
0   Gym / Fitness Center  0.09
1           Yoga Studio  0.09
2                   Pub  0.09
3           Coffee Shop  0.09
4         Breakfast Spot  0.09



    ----Capitol Hill----
                       venue  freq
0             Coffee Shop  0.21
1                     Bar  0.06
2          Sandwich Place  0.06
3   Fast Food Restaurant  0.06
4                Pharmacy  0.03



    ----Castleridge----
                     venue  freq
0           Grocery Store  0.15
```

```
1       Fast Food Restaurant   0.15
2           Indian Restaurant   0.09
3                  Coffee Shop   0.06
4  Middle Eastern Restaurant   0.06
```

----Cedarbrae----
```
                venue  freq
0            Coffee Shop   0.15
1             Pizza Place   0.15
2                     Bar   0.08
3    Seafood Restaurant   0.08
4          Liquor Store   0.08
```

----Chaparral----
```
                venue  freq
0            Coffee Shop   0.22
1            Gas Station   0.11
2       Sushi Restaurant   0.11
3           Liquor Store   0.11
4              Pharmacy   0.11
```

----Charleswood----
```
                        venue  freq
0                    Coffee Shop   0.08
1                           Pub   0.08
2   Construction & Landscaping   0.04
3                     Gift Shop   0.04
4                     Pet Store   0.04
```

----Chinatown----
```
                    venue  freq
0          Golf Course   0.14
1             Pharmacy   0.07
2      Sandwich Place   0.07
3   Food & Drink Shop   0.07
4               Bakery   0.07
```

----Chinook Park----
```
                venue  freq
0          Bagel Shop   0.08
1                Pier   0.08
2                Café   0.08
3           Pet Store   0.08
4     History Museum   0.08
```

----Christie Park----
```
                    venue  freq
0          Grocery Store   0.22
1                    Café   0.11
2                     Pub   0.11
3   Japanese Restaurant   0.11
```

```
4   Chinese Restaurant  0.11


   ----Citadel----
                  venue  freq
0          Golf Course   0.14
1             Pharmacy   0.07
2       Sandwich Place   0.07
3    Food & Drink Shop   0.07
4               Bakery   0.07


   ----Cityscape[2]----
                  venue  freq
0          Golf Course   0.14
1             Pharmacy   0.07
2       Sandwich Place   0.07
3    Food & Drink Shop   0.07
4               Bakery   0.07


   ----Cliff Bungalow----
                     venue  freq
0              Coffee Shop   0.08
1    Gym / Fitness Center   0.04
2               Restaurant   0.04
3                     Pub   0.04
4             Pizza Place   0.03


   ----Coach Hill----
                      venue  freq
0                 Pharmacy   0.11
1   Vietnamese Restaurant   0.11
2              Gas Station   0.11
3            Grocery Store   0.11
4                      Bar   0.11


   ----Collingwood----
                  venue  freq
0          Golf Course   0.14
1             Pharmacy   0.07
2       Sandwich Place   0.07
3    Food & Drink Shop   0.07
4               Bakery   0.07


   ----Copperfield----
                  venue  freq
0                 Trail  0.25
1          Liquor Store  0.25
2          Dance Studio  0.25
3     Convenience Store  0.25
4     Other Repair Shop  0.00
```

```
    ----Coral Springs----
                    venue  freq
0          Golf Course   0.14
1            Pharmacy   0.07
2       Sandwich Place   0.07
3    Food & Drink Shop   0.07
4              Bakery   0.07


    ----Cougar Ridge----
                    venue  freq
0   Fast Food Restaurant   0.25
1            Coffee Shop   0.12
2           Dance Studio   0.12
3       Sushi Restaurant   0.12
4               Ski Area   0.12


    ----Country Hills----
                    venue  freq
0   Vietnamese Restaurant   0.13
1            Coffee Shop   0.09
2              Pharmacy   0.09
3        Sandwich Place   0.04
4                   Spa   0.04


    ----Country Hills Village----
                    venue  freq
0          Grocery Store   0.10
1   Fast Food Restaurant   0.07
2            Coffee Shop   0.07
3                   Gym   0.05
4           Pizza Place   0.05


    ----Coventry Hills----
                              venue  freq
0                    Grocery Store   0.10
1                        Pet Store   0.06
2   Paper / Office Supplies Store   0.06
3                              Gym   0.06
4                        Juice Bar   0.03


    ----Cranston----
                    venue  freq
0          Golf Course   0.14
1            Pharmacy   0.07
2       Sandwich Place   0.07
3    Food & Drink Shop   0.07
4              Bakery   0.07


    ----Crescent Heights----
                    venue  freq
0    Chinese Restaurant   0.09
```

```
1     Vietnamese Restaurant  0.06
2         Sushi Restaurant  0.05
3                     Park  0.04
4          Sandwich Place  0.04
```

----Crestmont----

```
                      venue  freq
0             Playground  0.50
1           Home Service  0.25
2  Performing Arts Venue  0.25
3                 Museum  0.00
4            Music Store  0.00
```

----Dalhousie----

```
                      venue  freq
0          Grocery Store  0.10
1            Auto Garage  0.05
2         Sandwich Place  0.05
3    Fast Food Restaurant  0.05
4             Pizza Place  0.05
```

----Deer Ridge----

```
                      venue  freq
0  Fast Food Restaurant  0.15
1                    Pub  0.12
2          Grocery Store  0.08
3             Coffee Shop  0.08
4         Automotive Shop  0.04
```

----Deer Run----

```
                        venue  freq
0  Construction & Landscaping   0.2
1                     Dog Run   0.2
2                        Park   0.2
3              Baseball Field   0.2
4                      Forest   0.2
```

----Diamond Cove----

```
                   venue  freq
0    Other Repair Shop   0.2
1         Luggage Store   0.2
2           Golf Course   0.2
3    Chinese Restaurant   0.2
4             Astrologer   0.2
```

----Discovery Ridge----

```
                   venue  freq
0     Convenience Store  0.67
1                  Café  0.33
2                   ATM  0.00
3   Other Great Outdoors  0.00
```

```
4                 Park  0.00
```

```
----Douglasdale/Glen----
               venue  freq
0        Golf Course  0.14
1           Pharmacy  0.07
2     Sandwich Place  0.07
3  Food & Drink Shop  0.07
4             Bakery  0.07
```

```
----Dover----
                 venue  freq
0        Airport Lounge  0.15
1       Airport Service  0.15
2    American Restaurant  0.15
3   Fast Food Restaurant  0.15
4     Belgian Restaurant  0.08
```

```
----Downtown Commercial Core----
         venue  freq
0   Coffee Shop  0.09
1          Pub  0.07
2    Steakhouse  0.07
3    Restaurant  0.06
4         Hotel  0.06
```

```
----Downtown East Village----
                 venue  freq
0          Coffee Shop  0.11
1    Chinese Restaurant  0.07
2    Italian Restaurant  0.05
3              Theater  0.04
4   American Restaurant  0.04
```

```
----Downtown West End----
                 venue  freq
0          Coffee Shop  0.07
1                  Pub  0.06
2                  Bar  0.04
3    Italian Restaurant  0.03
4               Bakery  0.03
```

```
----Eagle Ridge----
            venue  freq
0          Museum  0.17
1  Sandwich Place  0.17
2          Bakery  0.08
3            Pier  0.08
4   Boat or Ferry  0.08
```

----Eau Claire----
```
         venue  freq
0  Coffee Shop  0.10
1         Park  0.08
2         Café  0.06
3   Restaurant  0.06
4   Steakhouse  0.05
```

----Edgemont----
```
                     venue  freq
0  Construction & Landscaping  0.25
1                Coffee Shop  0.25
2              Garden Center  0.25
3                 Playground  0.25
4        Other Great Outdoors  0.00
```

----Elbow Park----
```
                        venue  freq
0                        Park   0.6
1                       River   0.2
2             Athletics & Sports   0.2
3              Organic Grocery   0.0
4  Paper / Office Supplies Store   0.0
```

----Elboya----
```
          venue  freq
0    Restaurant  0.10
1           Bar  0.06
2   Coffee Shop  0.06
3  Shopping Mall  0.03
4      Tea Room  0.03
```

----Erin Woods----
```
                 venue  freq
0         Intersection  0.17
1    Convenience Store  0.17
2  Sporting Goods Shop  0.17
3       Paintball Field  0.17
4         Skating Rink  0.17
```

----Erlton----
```
              venue  freq
0       Coffee Shop  0.07
1              Park  0.05
2  French Restaurant  0.05
3               Pub  0.04
4           Brewery  0.04
```

----Evanston----
```
              venue  freq
0       Coffee Shop  0.08
```

```
1   Gym / Fitness Center  0.08
2           Grocery Store  0.08
3          Discount Store  0.04
4                Pharmacy  0.04
```

```
----Evergreen----
                                venue  freq
0                          Flower Shop  0.50
1                        Garden Center  0.25
2                          Pizza Place  0.25
3                      Organic Grocery  0.00
4  Paper / Office Supplies Store        0.00
```

```
----Fairview----
                     venue  freq
0           Farmers Market  0.08
1          Sushi Restaurant  0.06
2              Pizza Place  0.06
3      American Restaurant  0.06
4             Burger Joint  0.04
```

```
----Falconridge----
                     venue  freq
0     Fast Food Restaurant  0.33
1           Sandwich Place  0.17
2        Indian Restaurant  0.08
3                 Pharmacy  0.08
4             Skating Rink  0.08
```

```
----Forest Heights----
                      venue  freq
0    Vietnamese Restaurant  0.21
1            Grocery Store  0.12
2     Fast Food Restaurant  0.08
3        Convenience Store  0.08
4                 Pharmacy  0.04
```

```
----Forest Lawn----
                      venue  freq
0     Fast Food Restaurant  0.19
1            Grocery Store  0.12
2    Vietnamese Restaurant  0.12
3        Asian Restaurant  0.06
4             Skating Rink  0.06
```

```
----Glamorgan----
                   venue  freq
0          Pizza Place  0.18
1                  Bar  0.12
2                  Gym  0.06
3         Concert Hall  0.06
```

```
4   Convenience Store  0.06
```

```
----Glenbrook----
                    venue  freq
0         Grocery Store  0.17
1       Electronics Store  0.06
2  Vietnamese Restaurant  0.06
3             Hobby Shop  0.06
4                 Bakery  0.06
```

```
----Glendale----
                  venue  freq
0         Hockey Arena  0.18
1    Korean Restaurant  0.09
2          Coffee Shop  0.09
3             Pharmacy  0.09
4                 Park  0.09
```

```
----Greenview----
                    venue  freq
0  Fast Food Restaurant  0.14
1                 Diner  0.07
2     Convenience Store  0.07
3        Breakfast Spot  0.07
4          Gourmet Shop  0.07
```

```
----Greenwood/Greenbriar----
                  venue  freq
0                 Gym  0.27
1     History Museum  0.09
2             Theater  0.09
3         Skating Rink  0.09
4    Athletics & Sports  0.09
```

```
----Hamptons----
                       venue  freq
0             Pizza Place   0.2
1             Coffee Shop   0.1
2                   Park   0.1
3  Health & Beauty Service   0.1
4      Fast Food Restaurant   0.1
```

```
----Harvest Hills----
                    venue  freq
0         Grocery Store  0.11
1           Coffee Shop  0.11
2  Fast Food Restaurant  0.11
3                   Pub  0.06
4           Pizza Place  0.06
```

```
    ----Hawkwood----
                   venue  freq
0      Chinese Restaurant   0.4
1                    Park   0.2
2              Playground   0.2
3        Convenience Store   0.2
4    Other Great Outdoors   0.0



    ----Haysboro----
                   venue  freq
0      Sporting Goods Shop  0.09
1                    Café  0.09
2               Pet Store  0.09
3    Fast Food Restaurant  0.09
4              Coffee Shop  0.09



    ----Hidden Valley----
                   venue  freq
0             Pizza Place  0.33
1            Intersection  0.17
2       Convenience Store  0.17
3                    Park  0.17
4                   Trail  0.17



    ----Highland Park----
                   venue  freq
0       Italian Restaurant  0.11
1    Vietnamese Restaurant  0.11
2        Convenience Store  0.11
3              Pizza Place  0.11
4     Fast Food Restaurant  0.11



    ----Highwood----
                   venue  freq
0    Vietnamese Restaurant  0.17
1        Indian Restaurant  0.17
2     Fast Food Restaurant  0.17
3        Convenience Store  0.17
4                      Bar  0.17



    ----Hillhurst----
                   venue  freq
0              Coffee Shop  0.08
1                      Pub  0.07
2     American Restaurant  0.05
3         Sushi Restaurant  0.05
4             Burger Joint  0.03



    ----Hounsfield Heights/Briar Hill----
               venue  freq
0              Hotel  0.22
```

```
1              Café   0.06
2       Yoga Studio   0.06
3    Breakfast Spot   0.06
4       Coffee Shop   0.06
```

----Huntington Hills----

```
                    venue   freq
0             Coffee Shop   0.19
1           Grocery Store   0.19
2     Fast Food Restaurant  0.12
3      Italian Restaurant   0.06
4            Liquor Store   0.06
```

----Inglewood----

```
          venue   freq
0        Exhibit  0.07
1    Coffee Shop  0.07
2         Bakery  0.05
3     Restaurant  0.05
4        Brewery  0.03
```

----Kelvin Grove----

```
                   venue   freq
0              Pharmacy   0.12
1                  Café   0.12
2                  Pier   0.12
3     Convenience Store   0.12
4           Coffee Shop   0.12
```

----Killarney/Glengarry----

```
                    venue   freq
0       Convenience Store  0.09
1       Korean Restaurant  0.09
2     Fast Food Restaurant 0.04
3             Golf Course  0.04
4        Greek Restaurant  0.04
```

----Kincora----

```
                      venue   freq
0               Coffee Shop  0.11
1        Gym / Fitness Center 0.07
2             Grocery Store  0.07
3       Fast Food Restaurant 0.04
4    Health & Beauty Service 0.04
```

----Kingsland----

```
                  venue   freq
0           Coffee Shop  0.06
1                   Pub  0.06
2      Sushi Restaurant  0.06
3            Steakhouse  0.04
```

```
4      Burger Joint  0.04
```

```
----Lake Bonavista----
                venue  freq
0             Brewery  0.07
1      Sandwich Place  0.07
2       Grocery Store  0.07
3        Skating Rink  0.07
4    Food & Drink Shop  0.07
```

```
----Lakeview----
                   venue  freq
0                   Café  0.5
1                   Park  0.5
2                    ATM  0.0
3  Performing Arts Venue  0.0
4                 Museum  0.0
```

```
----Lincoln Park----
          venue  freq
0   Coffee Shop  0.19
1           Gym  0.12
2  Concert Hall  0.12
3    Restaurant  0.06
4    Food Court  0.06
```

```
----Lower Mount Royal----
                   venue  freq
0            Coffee Shop  0.09
1                    Pub  0.05
2  Vietnamese Restaurant  0.04
3            Pizza Place  0.04
4     Mexican Restaurant  0.04
```

```
----MacEwan Glen----
           venue  freq
0            Pub  0.17
1           Park  0.17
2     Sports Bar  0.17
3   Skating Rink  0.17
4   Liquor Store  0.17
```

```
----Mahogany----
                 venue  freq
0           Playground  0.33
1  Photography Studio  0.33
2             Boutique  0.17
3       Sandwich Place  0.17
4                  ATM  0.00
```

```
    ----Manchester----
                          venue  freq
0                      Locksmith  0.25
1                     Restaurant  0.25
2            American Restaurant  0.25
3       Construction & Landscaping  0.25
4            Other Great Outdoors  0.00



    ----Maple Ridge----
                   venue  freq
0            Golf Course   0.4
1           Liquor Store   0.2
2                    Bar   0.2
3       Convenience Store   0.2
4                    ATM   0.0



    ----Marlborough----
                     venue  freq
0       Fast Food Restaurant  0.09
1              Coffee Shop  0.09
2                 Pharmacy  0.09
3         Italian Restaurant  0.05
4                      Gym  0.05



    ----Marlborough Park----
                     venue  freq
0              Pizza Place  0.20
1       Fast Food Restaurant  0.15
2              Coffee Shop  0.10
3            Sandwich Place  0.10
4                 Pharmacy  0.10



    ----Martindale----
                      venue  freq
0          Convenience Store   0.4
1              Train Station   0.2
2          Athletics & Sports   0.2
3       Gym / Fitness Center   0.2
4                Music Venue   0.0



    ----Mayfair----
                        venue  freq
0             Clothing Store  0.27
1                 Steakhouse  0.07
2           Department Store  0.07
3       Furniture / Home Store  0.07
4           Convenience Store  0.07



    ----Mayland Heights----
                      venue  freq
0                     Hotel  0.18
```

```
1  Vietnamese Restaurant  0.18
2         Sandwich Place  0.12
3                  Diner  0.06
4          Grocery Store  0.06
```

----McKenzie Lake----

```
              venue  freq
0            Forest  0.18
1  Asian Restaurant  0.09
2              Lake  0.09
3        Shoe Store  0.09
4        Food Truck  0.09
```

----McKenzie Towne----

```
                 venue  freq
0          Pizza Place  0.07
1          Coffee Shop  0.07
2    Italian Restaurant  0.04
3  Fried Chicken Joint  0.04
4     Sushi Restaurant  0.04
```

----Meadowlark Park----

```
                  venue  freq
0         Clothing Store  0.12
1            Coffee Shop  0.05
2  Fast Food Restaurant  0.04
3         Cosmetics Shop  0.03
4   Sporting Goods Shop  0.03
```

----Midnapore----

```
                  venue  freq
0  Fast Food Restaurant  0.10
1           Coffee Shop  0.10
2              Pharmacy  0.05
3   American Restaurant  0.05
4          Liquor Store  0.05
```

----Millrise----

```
                        venue  freq
0            Convenience Store  0.12
1             Business Service  0.12
2  Paper / Office Supplies Store  0.12
3                 Liquor Store  0.12
4     Construction & Landscaping  0.12
```

----Mission----

```
             venue  freq
0     Burger Joint  0.05
1      Coffee Shop  0.05
2      Pizza Place  0.05
3   Breakfast Spot  0.05
```

```
4            Café  0.03
```

```
----Monterey Park----
                   venue  freq
0        Liquor Store   0.2
1  Sporting Goods Shop   0.2
2    Business Service   0.2
3    Convenience Store   0.2
4          Pizza Place   0.2
```

```
----Montgomery----
                   venue  freq
0          Coffee Shop  0.12
1  Fast Food Restaurant  0.09
2                 Park  0.07
3  Sporting Goods Shop  0.05
4       Clothing Store  0.05
```

```
----Mount Pleasant----
                   venue  freq
0  Fast Food Restaurant  0.14
1           Restaurant  0.09
2   Italian Restaurant  0.09
3   Chinese Restaurant  0.09
4          Coffee Shop  0.09
```

```
----New Brighton----
                   venue  freq
0          Pizza Place  0.10
1          Coffee Shop  0.10
2            Pet Store  0.06
3         Liquor Store  0.06
4  Gym / Fitness Center  0.03
```

```
----Nolan Hill----
                        venue  freq
0               Coffee Shop  0.14
1  Construction & Landscaping  0.14
2             Grocery Store  0.14
3                 Pharmacy  0.14
4      Fast Food Restaurant  0.14
```

```
----North Glenmore Park----
                 venue  freq
0         Golf Course  0.11
1      Breakfast Spot  0.11
2            Pharmacy  0.11
3              Bakery  0.06
4   Convenience Store  0.06
```

```
    ----North Haven----
                      venue  freq
0                      Gym   0.2
1     Indian Restaurant     0.2
2    Seafood Restaurant     0.2
3                   Bakery   0.2
4                     Park   0.2


    ----North Haven Upper----
                  venue  freq
0          Coffee Shop   0.4
1          Liquor Store  0.2
2                 Park   0.2
3        Grocery Store   0.2
4                  ATM   0.0


    ----Oakridge----
                            venue  freq
0                  Grocery Store   0.15
1                  Breakfast Spot  0.08
2      Construction & Landscaping  0.08
3                    Gas Station   0.08
4           Other Great Outdoors   0.08


    ----Ogden----
                            venue  freq
0                  Grocery Store   0.15
1                  Breakfast Spot  0.08
2      Construction & Landscaping  0.08
3                    Gas Station   0.08
4           Other Great Outdoors   0.08


    ----Palliser----
                         venue  freq
0                       Pub    0.10
1                Pizza Place    0.10
2       Fast Food Restaurant   0.10
3               Grocery Store  0.10
4              Breakfast Spot  0.05


    ----Panorama Hills----
                        venue  freq
0            Liquor Store    0.22
1            Grocery Store   0.11
2           Massage Studio   0.11
3                     Bank   0.06
4       Italian Restaurant   0.06


    ----Parkdale----
                    venue  freq
0        Ice Cream Shop   0.17
```

```
1        Sandwich Place  0.08
2           Coffee Shop  0.08
3            Hobby Shop  0.08
4    Chinese Restaurant  0.08


----Parkhill----
                 venue  freq
0  Fast Food Restaurant  0.10
1               Brewery  0.10
2    Mexican Restaurant  0.05
3              Tea Room  0.05
4           Coffee Shop  0.05


----Patterson----
                   venue  freq
0  Vietnamese Restaurant  0.25
1                    Bar  0.25
2            Gas Station  0.25
3       Convenience Store  0.25
4                    ATM  0.00


----Penbrooke Meadows----
                 venue  freq
0  Fast Food Restaurant  0.27
1           Pizza Place  0.18
2    Chinese Restaurant  0.09
3                   Pub  0.09
4              Pharmacy  0.09


----Pineridge----
                 venue  freq
0  Fast Food Restaurant  0.12
1          Liquor Store  0.12
2      Convenience Store  0.12
3    Sporting Goods Shop  0.06
4           Pizza Place  0.06


----Point Mckay----
                 venue  freq
0        Ice Cream Shop  0.15
1                  Park  0.08
2                 Trail  0.08
3    Chinese Restaurant  0.08
4   Gym / Fitness Center  0.08


----Pump Hill----
                venue  freq
0                Café  0.08
1                 Pub  0.08
2          Coffee Shop  0.08
3    Convenience Store  0.04
```

```
4    Grocery Store  0.04
```


----Queens Park Village----
```
                    venue  freq
0  Vietnamese Restaurant  0.17
1      Indian Restaurant  0.17
2   Fast Food Restaurant  0.17
3      Convenience Store  0.17
4                    Bar  0.17
```


----Queensland----
```
                       venue  freq
0      Fast Food Restaurant  0.12
1                    Market  0.06
2   Shabu-Shabu Restaurant  0.06
3             Grocery Store  0.06
4        Chinese Restaurant  0.06
```


----Ramsay----
```
                  venue  freq
0          Coffee Shop  0.07
1           Restaurant  0.05
2                Diner  0.04
3          Music Venue  0.04
4   Miscellaneous Shop  0.04
```


----Ranchlands----
```
                    venue  freq
0            Pizza Place   0.3
1  Vietnamese Restaurant   0.1
2  Outdoors & Recreation   0.1
3   Fast Food Restaurant   0.1
4     Seafood Restaurant   0.1
```


----Red Carpet----
```
                    venue  freq
0  Vietnamese Restaurant  0.14
1      Convenience Store  0.14
2           Liquor Store  0.14
3                   Park  0.14
4                   Lake  0.14
```


----Redstone----
```
                    venue  freq
0         Sandwich Place  0.25
1            Pizza Place  0.25
2              Gastropub  0.25
3                    Spa  0.25
4  Outdoors & Recreation  0.00
```

----Renfrew----
```
                  venue  freq
0        Hockey Arena  0.25
1       Grocery Store  0.12
2  Gym / Fitness Center  0.12
3   Italian Restaurant  0.12
4                Café  0.12
```

----Richmond----
```
              venue  freq
0        Coffee Shop  0.14
1      Grocery Store  0.10
2        Pizza Place  0.05
3  French Restaurant  0.05
4          Gastropub  0.05
```

----Rideau Park----
```
         venue  freq
0  Coffee Shop  0.14
1         Park  0.07
2          Bar  0.07
3       Bakery  0.07
4          Pub  0.04
```

----Riverbend----
```
                  venue  freq
0   Fast Food Restaurant  0.19
1           Coffee Shop  0.12
2           Pizza Place  0.12
3                  Pub  0.06
4  Vietnamese Restaurant  0.06
```

----Rocky Ridge----
```
             venue  freq
0     Liquor Store  0.25
1       Playground  0.25
2   Scenic Lookout  0.25
3          Stables  0.25
4       Print Shop  0.00
```

----Rosedale----
```
                  venue  freq
0    Chinese Restaurant  0.11
1           Coffee Shop  0.11
2         Noodle House  0.05
3  Fast Food Restaurant  0.05
4     Sushi Restaurant  0.05
```

----Rosemont----
```
         venue   freq
0          Park  0.12
```

```
1           Pub  0.06
2   Pizza Place  0.06
3   Golf Course  0.06
4           Spa  0.06
```

----Rosscarrock----
```
                    venue  freq
0    Fast Food Restaurant  0.11
1   Vietnamese Restaurant  0.05
2     Sporting Goods Shop  0.05
3             Pizza Place  0.05
4        Convenience Store  0.05
```

----Roxboro----
```
                venue  freq
0         Coffee Shop  0.09
1                Park  0.07
2   French Restaurant  0.05
3                 Bar  0.05
4      Breakfast Spot  0.05
```

----Royal Oak----
```
                  venue  freq
0      Business Service  0.33
1  Fast Food Restaurant  0.17
2        Baseball Field  0.17
3                   Spa  0.17
4                  Café  0.17
```

----Rundle----
```
                  venue  freq
0  Fast Food Restaurant  0.18
1                   Pub  0.09
2     Indian Restaurant  0.09
3            Smoke Shop  0.09
4           Pizza Place  0.09
```

----Rutland Park----
```
                    venue  freq
0             Coffee Shop  0.10
1        Korean Restaurant  0.06
2   Vietnamese Restaurant  0.06
3                     Bar  0.06
4              Hobby Shop  0.06
```

----Saddle Ridge----
```
              venue  freq
0       Pizza Place   0.2
1         Pet Store   0.1
2    Sandwich Place   0.1
3       Coffee Shop   0.1
```

```
4     Liquor Store    0.1


     ----Sage Hill----
                   venue  freq
0  Convenience Store    0.1
1        Coffee Shop    0.1
2     Breakfast Spot    0.1
3          Wine Shop    0.1
4           Pharmacy    0.1


     ----Sandstone Valley----
                     venue  freq
0           Coffee Shop  0.12
1            Playground  0.12
2          Liquor Store  0.12
3  Fast Food Restaurant  0.12
4           Pizza Place  0.12


     ----Scarboro----
                     venue  freq
0  Fast Food Restaurant  0.07
1           Record Shop  0.07
2                   Pub  0.07
3        Sandwich Place  0.07
4      Indian Restaurant  0.07


     ----Scarboro/Sunalta West----
             venue  freq
0          Café  0.18
1           Pub  0.09
2       Theater  0.09
3   Golf Course  0.09
4  Gourmet Shop  0.09


     ----Scenic Acres----
                   venue  freq
0  Chinese Restaurant  0.14
1                 Pub  0.07
2   Mobile Phone Shop  0.07
3        Skating Rink  0.07
4            Pharmacy  0.07


     ----Seton----
                   venue  freq
0              Hotel  0.14
1               Café  0.07
2       Liquor Store  0.07
3  Athletics & Sports  0.07
4          Coffee Shop  0.07
```

```
    ----Shaganappi----
                    venue  freq
0                   Café  0.12
1         Discount Store  0.06
2                 Bistro  0.06
3                    Pub  0.06
4      Convenience Store  0.06


    ----Shawnee Slopes----
                    venue  freq
0          Breakfast Spot  0.12
1             Golf Course  0.12
2      Light Rail Station  0.12
3             Pizza Place  0.12
4                  Garden  0.12


    ----Shawnessy----
                    venue  freq
0      Convenience Store  0.38
1             Gas Station  0.12
2            Liquor Store  0.12
3       Electronics Store  0.12
4             Pizza Place  0.12


    ----Sherwood----
                       venue  freq
0      Fast Food Restaurant  0.10
1        Sporting Goods Shop  0.08
2                Coffee Shop  0.05
3         American Restaurant  0.05
4     Furniture / Home Store  0.05


    ----Signal Hill----
                       venue  freq
0              Pizza Place  0.10
1              Coffee Shop  0.07
2      Fast Food Restaurant  0.07
3               Restaurant  0.05
4      Japanese Restaurant  0.02


    ----Silver Springs----
                       venue  freq
0      Gym / Fitness Center   0.2
1                       Pub   0.1
2               Pizza Place   0.1
3        Chinese Restaurant   0.1
4         Food & Drink Shop   0.1


    ----Silverado----
                    venue  freq
0             Coffee Shop  0.12
```

```
1          Grocery Store  0.12
2   Fast Food Restaurant  0.12
3           Liquor Store  0.12
4    Gym / Fitness Center  0.12
```

----Skyview Ranch----

```
           venue  freq
0     Pizza Place  0.33
1     Gas Station  0.17
2             Spa  0.17
3       Gastropub  0.17
4  Sandwich Place  0.17
```

----Somerset----

```
               venue  freq
0  Convenience Store  0.22
1        Gas Station  0.11
2       Burger Joint  0.11
3       Liquor Store  0.11
4        Bus Station  0.11
```

----South Calgary----

```
            venue  freq
0      Coffee Shop  0.16
1     Liquor Store  0.08
2              Pub  0.04
3      Music Store  0.04
4   Breakfast Spot  0.04
```

----Southview----

```
                   venue  freq
0          Grocery Store  0.16
1  Vietnamese Restaurant  0.11
2            Golf Course  0.05
3           Liquor Store  0.05
4               Pharmacy  0.05
```

----Southwood----

```
                venue  freq
0                 Pub  0.10
1         Coffee Shop  0.10
2       Grocery Store  0.06
3         Pizza Place  0.06
4   Light Rail Station  0.06
```

----Springbank Hill----

```
                venue  freq
0         Coffee Shop  0.25
1                 Spa  0.25
2    Indian Restaurant  0.25
3       Grocery Store  0.25
```

```
4     Organic Grocery  0.00
```

```
----Spruce Cliff----
                  venue  freq
0    Sporting Goods Shop  0.09
1     Chinese Restaurant  0.09
2            Coffee Shop  0.09
3    Fast Food Restaurant  0.09
4         Ice Cream Shop  0.09
```

```
----St. Andrews Heights----
                  venue  freq
0                 Hotel  0.18
1    Fast Food Restaurant  0.14
2            Pizza Place  0.09
3                   Inn  0.05
4             BBQ Joint  0.05
```

```
----Strathcona Park----
            venue  freq
0    Liquor Store  0.25
1        Building  0.25
2        Pharmacy  0.25
3   Grocery Store  0.25
4             ATM  0.00
```

```
----Sunalta----
                  venue  freq
0                   Pub  0.09
1          Grocery Store  0.07
2    Fast Food Restaurant  0.07
3         Sandwich Place  0.04
4         Breakfast Spot  0.04
```

```
----Sundance----
                  venue  freq
0                 Motel  0.25
1    Chinese Restaurant  0.25
2                  Lake  0.25
3           Pizza Place  0.25
4                   ATM  0.00
```

```
----Sunnyside----
                  venue  freq
0                   Pub  0.09
1       Sushi Restaurant  0.07
2            Coffee Shop  0.06
3    American Restaurant  0.04
4    Japanese Restaurant  0.04
```

```
    ----Taradale----
                  venue  freq
0         Coffee Shop  0.14
1       Grocery Store  0.14
2   Convenience Store  0.07
3           Pet Store  0.07
4                Bank  0.07


    ----Temple----
                  venue  freq
0   Convenience Store  0.22
1               Diner  0.11
2      Discount Store  0.11
3         Gas Station  0.11
4         Karaoke Bar  0.11


    ----Thorncliffe----
                      venue  freq
0             Coffee Shop  0.17
1                Pharmacy  0.11
2            Liquor Store  0.11
3       Convenience Store  0.11
4   Vietnamese Restaurant  0.06


    ----Tuscany----
               venue  freq
0      Coffee Shop  0.12
1    Grocery Store  0.12
2              Bar  0.12
3     Liquor Store  0.12
4        Pet Store  0.12


    ----Tuxedo Park----
                      venue  freq
0       Convenience Store  0.09
1       Chinese Restaurant  0.09
2              Restaurant  0.07
3   Fast Food Restaurant  0.07
4      Italian Restaurant  0.07


    ----University Heights----
                      venue  freq
0             Coffee Shop  0.17
1                     Pub  0.07
2                  Lounge  0.07
3   Fast Food Restaurant  0.07
4           Concert Hall  0.07


    ----University of Calgary----
                  venue  freq
0         Coffee Shop  0.13
```

```
1                  Pub  0.09
2             Pharmacy  0.04
3  Fast Food Restaurant  0.04
4          Concert Hall  0.04
```

----Upper Mount Royal----

```
              venue  freq
0          Coffee Shop  0.10
1    Convenience Store  0.08
2          Pizza Place  0.05
3    Athletics & Sports  0.05
4         Liquor Store  0.05
```

----Valley Ridge----

```
              venue  freq
0         Golf Course  0.25
1          Restaurant  0.25
2    Greek Restaurant  0.25
3   Convenience Store  0.25
4                 ATM  0.00
```

----Varsity----

```
                venue  freq
0          Coffee Shop  0.09
1  Fast Food Restaurant  0.09
2           Restaurant  0.06
3             Pharmacy  0.06
4          Pizza Place  0.06
```

----Vista Heights----

```
                 venue  freq
0                 Hotel  0.24
1  Vietnamese Restaurant  0.14
2                 Diner  0.05
3  Fast Food Restaurant  0.05
4               Brewery  0.05
```

----Walden----

```
                venue  freq
0           Playground  0.33
1             Pharmacy  0.33
2    Gym / Fitness Center  0.33
3                  ATM  0.00
4  Outdoors & Recreation  0.00
```

----West Hillhurst----

```
                venue  freq
0           Hobby Shop  0.12
1          Pizza Place  0.12
2           Restaurant  0.06
3   Arts & Crafts Store  0.06
```

```
4         Hockey Arena  0.06



----West Springs----
                venue  freq
0      Convenience Store   0.2
1            Gas Station   0.2
2                    Bar   0.2
3             Restaurant   0.2
4  Vietnamese Restaurant   0.2



----Westgate----
               venue  freq
0          Kids Store  0.25
1                 Pub  0.25
2   Convenience Store  0.25
3         Pizza Place  0.25
4     Organic Grocery  0.00



----Whitehorn----
                venue  freq
0      Convenience Store  0.33
1  Vietnamese Restaurant  0.11
2     Chinese Restaurant  0.11
3     Light Rail Station  0.11
4                  Diner  0.11



----Wildwood----
                venue  freq
0               Dog Run  0.14
1     Convenience Store  0.14
2            Steakhouse  0.14
3     Chinese Restaurant  0.14
4  Fast Food Restaurant  0.14



----Willow Park----
               venue  freq
0         Grocery Store  0.18
1           Golf Course  0.09
2          Liquor Store  0.09
3     Miscellaneous Shop  0.09
4      Convenience Store  0.09



----Windsor Park----
                venue  freq
0            Coffee Shop  0.24
1         Sandwich Place  0.07
2                Theater  0.07
3            College Gym  0.07
4  Fast Food Restaurant  0.07
```

```
    ----Winston Heights/Mountview----
                venue  freq
0        Golf Course  0.12
1        Pizza Place  0.08
2  Convenience Store  0.08
3      Grocery Store  0.08
4       Hockey Arena  0.08



    ----Woodbine----
               venue  freq
0  Asian Restaurant   0.1
1    Sandwich Place   0.1
2          Pharmacy   0.1
3            Bakery   0.1
4              Park   0.1



    ----Woodlands----
                venue  freq
0        Golf Course  0.14
1           Pharmacy  0.07
2     Sandwich Place  0.07
3  Food & Drink Shop  0.07
4             Bakery  0.07
```

VISUALIZATION OF THE VENUES IN EACH NEIGHBORHOOD: PROFILE BUILDING

In [20]:

```python
#To Facilitate the visualization of the main Venues per Neighborhood in Calgary,
# Let's write Previous information into a Pandas DataFrame

def return_most_common_venues(row, num_top_venues):
    row_categories = row.iloc[1:]
    row_categories_sorted = row_categories.sort_values(ascending=False)

    return row_categories_sorted.index.values[0:num_top_venues]

num_top_venues = 10

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

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

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

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

neighborhoods_venues_sorted.head(10)
```

Out[20]:

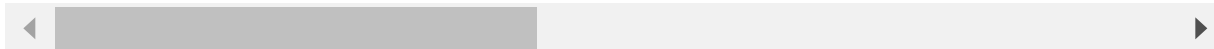|	Neighborhood	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	
0	Abbeydale	Café	Filipino Restaurant	Convenience Store	Sandwich Place	Home Service	Zoo Exhibit	
1	Albert Park/Radisson Heights	Pizza Place	Grocery Store	Sandwich Place	Asian Restaurant	Ethiopian Restaurant	Smoke Shop	
2	Altadore	Dog Run	Park	Greek Restaurant	Bar	Coffee Shop	Massage Studio	
3	Applewood Park	Park	Liquor Store	Coffee Shop	Warehouse Store	Food Court	Filipino Restaurant	
4	Arbour Lake	Spa	Furniture / Home Store	Yoga Studio	Bookstore	Convenience Store	Steakhouse	Vi... R...
5	Aspen Woods	Coffee Shop	Asian Restaurant	Cupcake Shop	Mexican Restaurant	Boutique	Food & Drink Shop	
6	Auburn Bay	Construction & Landscaping	Breakfast Spot	Water Park	Health & Beauty Service	Frozen Yogurt Shop	Fried Chicken Joint	F
7	Banff Trail	Hotel	Fast Food Restaurant	Park	Liquor Store	Coffee Shop	Pizza Place	
8	Bankview	Coffee Shop	Vietnamese Restaurant	Pub	Fast Food Restaurant	Pizza Place	Mexican Restaurant	S
9	Bayview	Pub	Grocery Store	Park	Other Great Outdoors	Breakfast Spot	French Restaurant	

In [21]:

```
#Merge the inital Calgary Dataframe with Sorted Most Visited places for each Neighborhood

Calgary_merged = Calgary.join (neighborhoods_venues_sorted.set_index('Neighborhood'), on=
'Neighborhood')
Calgary_merged.head(10)
```

Out[21]:

	Neighborhood	Sector	Ward	Type	Population	Area (km2)	Population Density	Latitude	Longit
0	Abbeydale	Northeast	10	Residential	5917.0	1.7	3480.6	51.058836	-113.929
1	Acadia	South	9	Residential	10705.0	3.9	2744.9	51.102527	-110.213
2	Albert Park/Radisson Heights	East	10	Residential	6234.0	2.5	2493.6	51.044845	-113.990
3	Altadore	Centre	11	Residential	9116.0	2.9	3143.4	51.015104	-114.100
4	Applewood Park	East	10	Residential	6498.0	1.6	4061.3	51.044658	-113.928
5	Arbour Lake	Northwest	2	Residential	10836.0	4.4	2462.7	51.136786	-114.202
6	Aspen Woods	West	6	Residential	5271.0	3.8	1387.1	51.043119	-114.210
7	Auburn Bay	Southeast	12	Residential	7193.0	4.5	1598.4	50.890605	-113.959
8	Banff Trail	Centre	7	Residential	3837.0	1.5	2558	51.071462	-114.11
9	Bankview	Centre	8	Residential	5221.0	0.7	7458.6	51.033887	-114.099

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In [22]:

```python
# Let's get rid of the Neighborhoods where Foursquare did not find any Venues within the Investigation radius

Calgary_clear = Calgary_merged.dropna(subset=['Population', '1st Most Common Venue'])
Calgary_clear
```

Out[22]:

	Neighborhood	Sector	Ward	Type	Population	Area (km2)	Population Density	Latitude
0	Abbeydale	Northeast	10	Residential	5917.0	1.7	3480.6	51.058836
2	Albert Park/Radisson Heights	East	10	Residential	6234.0	2.5	2493.6	51.044845
3	Altadore	Centre	11	Residential	9116.0	2.9	3143.4	51.015104
4	Applewood Park	East	10	Residential	6498.0	1.6	4061.3	51.044658
5	Arbour Lake	Northwest	2	Residential	10836.0	4.4	2462.7	51.136786
6	Aspen Woods	West	6	Residential	5271.0	3.8	1387.1	51.043119
7	Auburn Bay	Southeast	12	Residential	7193.0	4.5	1598.4	50.890605
8	Banff Trail	Centre	7	Residential	3837.0	1.5	2558	51.071462
9	Bankview	Centre	8	Residential	5221.0	0.7	7458.6	51.033887
10	Bayview	South	11	Residential	682.0	0.4	1705	50.975278
11	Beddington Heights	North	4	Residential	11585.0	3.2	3620.3	51.128598
12	Bel-Aire	Centre	11	Residential	424.0	0.3	1413.3	50.999444
13	Beltline	Centre	8	Residential	19681.0	2.9	6786.6	51.040498
14	Bonavista Downs	South	14	Residential	925.0	0.5	1850	50.944656
15	Bowness	Northwest	1	Residential	11012.0	5.6	1966.4	51.089277
16	Braeside	South	11	Residential	5940.0	2.0	2970	50.955784
17	Brentwood	Northwest	7	Residential	6059.0	2.9	2089.3	51.098611
18	Bridgeland/Riverside	Centre	7/9	Residential	5594.0	3.1	1804.5	51.053801
19	Bridlewood	South	13	Residential	11835.0	3.2	3698.4	50.900713
20	Britannia	Centre	11	Residential	803.0	0.5	1606	51.012540

	Neighborhood	Sector	Ward	Type	Population	Area (km2)	Population Density	Latitude
21	Cambrian Heights	Centre	7	Residential	2059.0	0.9	2287.8	51.087196
22	Canyon Meadows	South	13	Residential	7787.0	3.1	2511.9	50.942825
23	Capitol Hill	Centre	7	Residential	4015.0	1.4	2867.9	51.070556
24	Castleridge	Northeast	5	Residential	6096.0	1.2	5080	51.105977
25	Cedarbrae	South	11	Residential	6237.0	2.1	2970	50.956318
26	CFB Currie	West	11	Residential	172.0	1.1	156.4	50.941389
27	CFB Lincoln Park PMQ	West	11	Residential	1973.0	0.4	4932.5	50.941389
28	Chaparral	South	14	Residential	11552.0	5.4	2139.3	50.883594
29	Charleswood	Northwest	7	Residential	3421.0	1.8	1900.6	51.084161
30	Chinatown	Centre	7	Residential	1577.0	0.2	7885	50.941389
31	Chinook Park	South	11	Residential	1707.0	0.6	2845	50.983123
32	Christie Park	West	6	Residential	2196.0	0.8	2745	51.038434
33	Citadel	Northwest	2	Residential	10197.0	2.7	3776.7	50.941389
35	Cliff Bungalow	Centre	8	Residential	1936.0	0.4	4840	51.034436
36	Coach Hill	West	6	Residential	3279.0	1.1	2980.9	51.055422
37	Collingwood	Northwest	7	Residential	2222.0	1.6	1388.8	50.941389
38	Copperfield	Southeast	12	Residential	7834.0	4.4	1780.5	50.912048
39	Coral Springs	Northeast	5	Residential	5868.0	1.8	3260	50.941389
40	Cougar Ridge	West	6	Residential	5874.0	2.2	2670	51.070710
41	Country Hills	North	4	Residential	3728.0	1.9	1962.1	51.143001
42	Country Hills Village	North	3	Residential	2615.0	1.0	2615	51.157500

	Neighborhood	Sector	Ward	Type	Population	Area (km2)	Population Density	Latitude
43	Coventry Hills	North	3	Residential	15969.0	4.1	3894.9	51.163596
44	Cranston	Southeast	12	Residential	11857.0	8.3	1428.6	50.941389
45	Crescent Heights	Centre	7	Residential	6271.0	1.6	3919.4	51.059629
46	Crestmont	West	1	Residential	1454.0	0.6	2423.3	51.085215
47	Dalhousie	Northwest	7	Residential	9085.0	3.3	2753	51.106849
48	Deer Ridge	South	14	Residential	4084.0	1.4	2917.1	50.927276
49	Deer Run	South	14	Residential	5341.0	1.9	2811.1	50.920297
50	Diamond Cove	South	14	Residential	699.0	0.5	1398	50.946477
51	Discovery Ridge	West	6	Residential	4350.0	3.6	1208.3	51.014140
52	Douglasdale/Glen	Southeast	12	Residential	11890.0	6.4	1857.8	50.941389
53	Dover	East	9	Residential	10474.0	4.2	2493.8	51.129980
54	Downtown Commercial Core	Centre	7/8	Residential	8015.0	1.3	6165.4	51.047378
55	Downtown East Village	Centre	7	Residential	2782.0	0.5	5564	51.046496
56	Downtown West End	Centre	8	Residential	2322.0	0.4	5805	51.047554
57	Eagle Ridge	South	11	Residential	415.0	0.4	1037.5	50.985116
58	Eau Claire	Centre	7	Residential	1851.0	0.5	3702	51.053056
59	Edgemont	Northwest	4	Residential	15898.0	6.6	2408.8	53.470202
60	Elbow Park	Centre	8/11	Residential	3377.0	1.8	1876.1	51.020634
61	Elboya	Centre	11	Residential	1712.0	0.7	2445.7	51.011575
62	Erin Woods	East	10	Residential	6901.0	1.6	4313.1	51.019345
63	Erlton	Centre	9	Residential	1234.0	0.5	2468	51.029086

	Neighborhood	Sector	Ward	Type	Population	Area (km2)	Population Density	Latitude
64	Evanston	North	2	Residential	6594.0	4.9	1345.7	51.163333
65	Evergreen	South	13	Residential	20110.0	4.6	4371.7	53.631252
66	Fairview	South	9	Residential	3623.0	1.3	2786.9	50.985000
67	Falconridge	Northeast	5	Residential	10381.0	2.2	4718.6	51.102692
68	Forest Heights	East	10	Residential	6212.0	1.5	4141.3	51.041111
69	Forest Lawn	East	10	Residential	7487.0	2.3	3255.2	51.033333
70	Glamorgan	West	6	Residential	6376.0	2.0	3188	51.013442
71	Glenbrook	West	6	Residential	7056.0	1.9	3713.7	51.023309
72	Glendale	West	6	Residential	2749.0	1.4	1963.6	51.033056
73	Greenview	North	4	Residential	1975.0	0.5	3950	51.093889
74	Greenwood/Greenbriar	Northwest	1	Residential	946.0	1.2	788.3	51.090697
75	Hamptons	Northwest	2	Residential	7905.0	3.5	2258.6	51.145669
76	Harvest Hills	North	3	Residential	7402.0	2.2	3364.5	51.148198
77	Hawkwood	Northwest	2	Residential	9831.0	3.2	3072.2	51.129711
78	Haysboro	South	11	Residential	6943.0	2.7	2571.5	50.973967
79	Hidden Valley	North	4	Residential	11799.0	4.3	2744	51.151085
80	Highland Park	Centre	4	Residential	3792.0	1.4	2708.6	51.087222
81	Highwood	Centre	7	Residential	2214.0	0.9	2460	51.091547
82	Hillhurst	Centre	7	Residential	6291.0	2.1	2995.7	51.055414
84	Hounsfield Heights/Briar Hill	Centre	7	Residential	2954.0	1.2	2461.7	51.063987
85	Huntington Hills	North	4	Residential	13213.0	4.8	2752.7	51.118724

	Neighborhood	Sector	Ward	Type	Population	Area (km2)	Population Density	Latitude
86	Inglewood	Centre	9	Residential	3564.0	2.5	1425.6	51.042778
87	Kelvin Grove	South	11	Residential	2343.0	0.8	2928.8	50.990556
88	Killarney/Glengarry	Centre	8	Residential	6816.0	1.8	3786.7	51.031579
89	Kincora	North	2	Residential	4876.0	2.3	2120	51.158447
90	Kingsland	South	11	Residential	4513.0	1.3	3471.5	50.986324
91	Lake Bonavista	South	14	Residential	10475.0	5.2	2014.4	50.939987
92	Lakeview	West	11	Residential	5468.0	2.2	2485.5	50.994722
94	Lincoln Park	West	11	Residential	2505.0	1.5	1670	51.011389
95	Lower Mount Royal	Centre	8	Residential	3180.0	0.3	10600	51.036645
96	MacEwan Glen	North	4	Residential	5100.0	1.4	3642.9	51.136808
97	Mahogany	Southeast	12	Residential	1266.0	6.4	197.8	50.900000
98	Manchester	Centre	9	Residential	618.0	0.5	1236	51.020556
99	Maple Ridge	South	14	Residential	1910.0	2.8	682.1	50.957500
100	Marlborough	Northeast	10	Residential	8434.0	2.7	3123.7	51.059444
101	Marlborough Park	Northeast	10	Residential	8391.0	2.5	3356.4	51.059881
102	Martindale	Northeast	5	Residential	13674.0	2.7	5064.4	51.118134
103	Mayfair	Centre	11	Residential	481.0	0.3	1603.3	50.995278
104	Mayland Heights	Northeast	10	Residential	5833.0	2.0	2916.5	51.060571
105	McKenzie Lake	Southeast	12	Residential	14050.0	5.1	2754.9	50.911282
106	McKenzie Towne	Southeast	12	Residential	16102.0	4.8	3354.6	50.916499
107	Meadowlark Park	Centre	11	Residential	623.0	0.6	1038.3	50.997947
108	Midnapore	South	14	Residential	6861.0	2.9	2365.9	50.910752

	Neighborhood	Sector	Ward	Type	Population	Area (km2)	Population Density	Latitude
109	Millrise	South	13	Residential	6892.0	1.8	3828.9	50.916609
110	Mission	Centre	8	Residential	4325.0	0.5	8650	51.031944
111	Monterey Park	Northeast	5	Residential	10470.0	3.4	3079.4	51.081667
112	Montgomery	Northwest	1	Residential	3860.0	3.0	1286.7	51.077222
113	Mount Pleasant	Centre	7	Residential	4851.0	1.9	2553.2	51.072500
114	New Brighton	Southeast	12	Residential	8303.0	2.9	2863.1	50.921389
115	Nolan Hill	North	2	Residential	0.0	2.1	0	51.175000
116	North Glenmore Park	West	11	Residential	2386.0	1.2	1988.3	51.002533
117	North Haven	North	4	Residential	2288.0	0.8	2860	51.096111
118	North Haven Upper	North	4	Residential	622.0	0.3	2073.3	51.103455
119	Oakridge	South	11	Residential	5651.0	2.4	2354.6	50.967778
120	Ogden	Southeast	9	Residential	8702.0	4.1	2122.4	50.967778
121	Palliser	South	11	Residential	3293.0	1.0	3293	50.967469
122	Panorama Hills	North	3	Residential	22247.0	6.3	3531.3	51.160946
123	Parkdale	Centre	7	Residential	2296.0	1.1	2087.3	51.058889
124	Parkhill	Centre	9	Residential	1592.0	0.7	2274.3	51.021389
126	Patterson	West	6	Residential	4281.0	2.0	2140.5	51.062259
127	Penbrooke Meadows	East	10	Residential	8547.0	2.0	4273.5	51.047740
128	Pineridge	Northeast	5	Residential	9644.0	2.6	3709.2	51.074167
129	Point Mckay	Centre	7	Residential	1318.0	0.4	3295	51.060167
130	Pump Hill	South	11	Residential	1614.0	0.9	1793.3	50.968121

	Neighborhood	Sector	Ward	Type	Population	Area (km2)	Population Density	Latitude
131	Queens Park Village	Centre	7	Residential	415.0	0.6	691.7	51.086803
132	Queensland	South	14	Residential	4771.0	1.6	2981.9	50.938056
133	Ramsay	Centre	9	Residential	2110.0	1.0	2110	51.037727
134	Ranchlands	Northwest	2	Residential	7626.0	2.3	3315.7	51.120013
135	Red Carpet	East	10	Residential	1555.0	0.6	2591.7	51.041307
136	Redstone	Northeast	3	Residential	0.0	1.9	0	51.171218
137	Renfrew	Centre	9	Residential	5846.0	2.7	2165.2	51.062222
138	Richmond	Centre	8	Residential	4229.0	1.8	2349.4	51.031389
139	Rideau Park	Centre	9	Residential	636.0	0.3	2120	51.024344
140	Riverbend	Southeast	9	Residential	9684.0	4.1	2362	50.972778
141	Rocky Ridge	Northwest	1	Residential	7662.0	2.8	2736.4	51.143274
142	Rosedale	Centre	7	Residential	1569.0	0.7	2241.4	51.063889
143	Rosemont	Centre	7	Residential	1241.0	0.5	2482	51.078056
144	Rosscarrock	West	8	Residential	3356.0	1.1	3050.9	51.042694
145	Roxboro	Centre	9	Residential	421.0	0.3	1403.3	51.027124
146	Royal Oak	Northwest	2	Residential	11252.0	3.6	3125.6	51.143333
147	Rundle	Northeast	5	Residential	11258.0	2.6	4330	51.073233
148	Rutland Park	West	11	Residential	2227.0	0.7	3181.4	51.021847
149	Saddle Ridge	Northeast	3	Residential	14372.0	5.5	2613.1	51.129706
150	Sage Hill	North	2	Residential	2189.0	3.8	576.1	51.175000
151	Sandstone Valley	North	4	Residential	6253.0	1.8	3473.9	51.137325
152	Scarboro	Centre	8	Residential	880.0	0.5	1760	51.039901

	Neighborhood	Sector	Ward	Type	Population	Area (km2)	Population Density	Latitude
153	Scarboro/Sunalta West	Centre	8	Residential	410.0	0.4	1025	51.041052
154	Scenic Acres	Northwest	1	Residential	8650.0	4.3	2011.6	51.119741
155	Seton	Southeast	12	Residential	0.0	1.7	0	50.880000
156	Shaganappi	Centre	8	Residential	1553.0	1.5	1035.3	51.042939
157	Shawnee Slopes	South	13	Residential	1565.0	1.2	1304.2	50.925362
158	Shawnessy	South	13	Residential	9385.0	3.7	2536.5	50.908539
159	Sherwood	North	2	Residential	2523.0	2.4	1051.3	51.161000
160	Signal Hill	West	6	Residential	13914.0	5.6	2484.6	51.023313
161	Silver Springs	Northwest	1	Residential	8933.0	5.0	1786.6	51.109649
162	Silverado	South	14	Residential	5136.0	5.1	1007.1	50.884366
163	Skyview Ranch	Northeast	3	Residential	2990.0	4.6	650	51.160534
164	Somerset	South	13	Residential	8540.0	2.3	3713	50.897778
165	South Calgary	Centre	8	Residential	3698.0	0.9	4108.9	51.026135
166	Southview	East	10	Residential	1900.0	1.6	1187.5	51.033892
167	Southwood	South	11	Residential	6085.0	2.7	2253.7	50.957248
168	Springbank Hill	West	6	Residential	8783.0	6.3	1394.1	51.028926
169	Spruce Cliff	West	8	Residential	4285.0	1.1	3895.5	51.049706
170	St. Andrews Heights	Centre	7	Residential	1588.0	1.2	1323.3	51.063756
171	Strathcona Park	West	6	Residential	7033.0	2.7	2604.8	51.047868
172	Sunalta	Centre	8	Residential	3314.0	0.9	3682.2	51.042940
173	Sundance	South	14	Residential	10499.0	4.0	2624.8	50.897776
174	Sunnyside	Centre	7	Residential	3704.0	1.0	3704	51.052778

	Neighborhood	Sector	Ward	Type	Population	Area (km2)	Population Density	Latitude
175	Taradale	Northeast	3	Residential	16841.0	2.9	5807.2	51.116835
176	Temple	Northeast	5	Residential	10894.0	2.6	4190	51.088889
177	Thorncliffe	North	4	Residential	8693.0	3.3	2634.2	51.106096
178	Tuscany	Northwest	1	Residential	19013.0	6.9	2755.5	51.123889
179	Tuxedo Park	Centre	9	Residential	4571.0	1.3	3516.2	51.073788
180	University Heights	Northwest	1	Residential	2928.0	0.8	3660	51.070740
181	University of Calgary	Northwest	1	Residential	2725.0	2.7	1009.3	51.078365
182	Upper Mount Royal	Centre	8	Residential	2542.0	1.3	1955.4	51.029358
183	Valley Ridge	West	1	Residential	5013.0	3.3	1519.1	51.094066
184	Varsity	Northwest	1	Residential	12200.0	6.8	1794.1	51.092222
185	Vista Heights	Northeast	5	Residential	2204.0	1.1	2003.6	51.072002
186	Walden	South	14	Residential	935.0	2.4	389.6	50.869568
187	West Hillhurst	Centre	7	Residential	5802.0	2.4	2417.5	51.055043
188	West Springs	West	6	Residential	8228.0	4.1	2006.8	51.059722
189	Westgate	West	8	Residential	3172.0	1.2	2643.3	51.045323
190	Whitehorn	Northeast	5	Residential	11852.0	2.6	4558.5	51.088808
191	Wildwood	West	8	Residential	2598.0	2.6	999.2	51.051944
192	Willow Park	South	14	Residential	5229.0	3.4	1537.9	50.960293
193	Windsor Park	Centre	11	Residential	4126.0	1.3	3173.8	53.524616
194	Winston Heights/Mountview	Centre	9	Residential	3891.0	3.0	1297	51.072303
195	Woodbine	South	13	Residential	9131.0	3.2	2853.4	50.942554

	Neighborhood	Sector	Ward	Type	Population	Area (km2)	Population Density	Latitude
196	Woodlands	South	13	Residential	6201.0	2.8	2214.6	50.941389

◀ ▶

GET AN OVERALL IDEA OF THE MOST POPULAR TYPE OF VENUES IN CALGARY

This Information will be useful to start filtering the different Neighborhoods based on the personal interest

In [23]:

```python
# We have seen that there are 266 unique categories in the Venues Data-Frame in Calgary.
# Let's see the Frequency of Each Category

print (calgary_venues['Venue Category'].value_counts())
```

Coffee Shop	302
Fast Food Restaurant	155
Pub	152
Grocery Store	150
Pizza Place	148
Sandwich Place	115
Convenience Store	108
Liquor Store	100
Vietnamese Restaurant	99
Park	99
Pharmacy	94
Restaurant	93
Chinese Restaurant	71
Bar	69
Café	62
Italian Restaurant	61
Breakfast Spot	60
Hotel	59
Bakery	58
American Restaurant	58
Sushi Restaurant	56
Gym / Fitness Center	53
Golf Course	51
Japanese Restaurant	48
Burger Joint	47
Asian Restaurant	44
Gym	43
Steakhouse	39
Bank	37
Mexican Restaurant	35
Indian Restaurant	34
Pet Store	33
Diner	33
Sporting Goods Shop	32
Korean Restaurant	28
French Restaurant	26
Gastropub	25
Brewery	24
Electronics Store	23
Shopping Mall	23
Clothing Store	23
Yoga Studio	22
Middle Eastern Restaurant	21
Ice Cream Shop	21
Athletics & Sports	21
Food & Drink Shop	20
Seafood Restaurant	19
Gas Station	19
Tea Room	18
Hockey Arena	18
Sports Bar	17
Discount Store	17
Deli / Bodega	17
Trail	16
BBQ Joint	16
Gourmet Shop	16
Cosmetics Shop	16

Theater	16
Bookstore	16
Skating Rink	16
Furniture / Home Store	15
Department Store	15
Wine Shop	15
Mediterranean Restaurant	14
Noodle House	14
Spa	14
Light Rail Station	14
Cocktail Bar	14
Smoothie Shop	13
Lounge	13
Greek Restaurant	13
Concert Hall	13
Wine Bar	12
Gift Shop	12
Hobby Shop	12
Thai Restaurant	12
Other Repair Shop	11
Dessert Shop	11
Toy / Game Store	11
Food Court	11
Falafel Restaurant	11
Construction & Landscaping	11
Playground	10
Dog Run	10
Fried Chicken Joint	9
Lake	9
Arts & Crafts Store	9
Market	9
Paper / Office Supplies Store	9
Record Shop	9
Juice Bar	9
Brazilian Restaurant	9
Museum	9
Music Venue	9
Performing Arts Venue	9
Scenic Lookout	9
Comic Shop	8
History Museum	8
Salon / Barbershop	8
Moroccan Restaurant	8
Nightclub	8
Shoe Store	8
Smoke Shop	8
Home Service	8
Health & Beauty Service	8
Vegetarian / Vegan Restaurant	7
Movie Theater	7
Pool	7
Hockey Rink	7
Event Space	6
Women's Store	6
Business Service	6
Snack Place	6
Miscellaneous Shop	6

Karaoke Bar	6
Train Station	6
Dance Studio	6
Massage Studio	6
New American Restaurant	6
Supermarket	6
Music Store	6
Southern / Soul Food Restaurant	5
Intersection	5
Camera Store	5
Ramen Restaurant	5
Indie Movie Theater	5
Supplement Shop	5
Frozen Yogurt Shop	5
Farmers Market	5
Thrift / Vintage Store	5
Donut Shop	5
Automotive Shop	5
Big Box Store	4
Bubble Tea Shop	4
Flower Shop	4
Garden Center	4
Scandinavian Restaurant	4
Hookah Bar	4
Filipino Restaurant	4
Casino	4
Bowling Alley	4
Inn	4
Latin American Restaurant	4
College Gym	4
Exhibit	4
Video Game Store	4
Bagel Shop	4
School	4
Library	4
Art Gallery	4
Baseball Field	4
Other Great Outdoors	4
River	3
Food Truck	3
Eastern European Restaurant	3
Hardware Store	3
Ethiopian Restaurant	3
Hot Dog Joint	3
Video Store	3
High School	3
Rental Car Location	3
Pier	3
Comedy Club	3
Motel	3
Irish Pub	3
Mattress Store	3
Beer Garden	3
Building	3
Skate Park	3
Dim Sum Restaurant	3
Hostel	3

```
Bus Station                                      3
Tapas Restaurant                                 3
Island                                           3
Gluten-free Restaurant                           3
Forest                                           3
Argentinian Restaurant                           3
Boutique                                         3
Used Bookstore                                   3
Stadium                                          3
IT Services                                      3
Motorcycle Shop                                  2
Kids Store                                       2
Recreation Center                                2
Medical Center                                   2
Photography Studio                               2
Student Center                                   2
Fabric Shop                                      2
Luggage Store                                    2
Soccer Field                                     2
Men's Store                                      2
Indonesian Restaurant                            2
Shabu-Shabu Restaurant                           2
Accessories Store                                2
Piano Bar                                        2
Paintball Field                                  2
Water Park                                       2
Airport Lounge                                   2
Insurance Office                                 2
Kitchen Supply Store                             2
Airport Service                                  2
Food                                             2
Bistro                                           2
Shop & Service                                   2
Warehouse Store                                  2
Circus                                           2
Board Shop                                       2
Speakeasy                                        2
Baseball Stadium                                 2
Plaza                                            2
Neighborhood                                     2
Football Stadium                                 2
Astrologer                                       2
Organic Grocery                                  2
Candy Store                                      2
Auto Garage                                      2
Cajun / Creole Restaurant                        2
Wings Joint                                      2
Residential Building (Apartment / Condo)         2
Sports Club                                      1
General Entertainment                            1
African Restaurant                               1
Tennis Court                                     1
Cupcake Shop                                     1
Tourist Information Center                       1
Zoo Exhibit                                      1
Hong Kong Restaurant                             1
Hockey Field                                     1
```

```
Gym Pool                          1
Print Shop                        1
Locksmith                         1
Soccer Stadium                    1
Event Service                     1
Garden                            1
Bus Line                          1
Elementary School                 1
Dry Cleaner                       1
College Residence Hall            1
Waste Facility                    1
Lingerie Store                    1
College Classroom                 1
Professional & Other Places       1
Moving Target                     1
Tattoo Parlor                     1
Poutine Place                     1
Boat or Ferry                     1
Poke Place                        1
Stables                           1
Gun Shop                          1
Historic Site                     1
Theme Park                        1
Belgian Restaurant                1
Travel & Transport                1
Indie Theater                     1
Bridal Shop                       1
Road                              1
Airport Food Court                1
Racetrack                         1
Swiss Restaurant                  1
Outdoors & Recreation             1
Mobile Phone Shop                 1
Jewelry Store                     1
Auto Dealership                   1
Airport Terminal                  1
ATM                               1
Ski Area                          1
Name: Venue Category, dtype: int64
```

In [24]:

```python
# Now, let's create a dataframe of top 10 categories
Calgary_Venues_Top10 = calgary_venues['Venue Category'].value_counts()[0:10].to_frame(name
='frequency')
Calgary_Venues_Top10.reset_index()
Calgary_Venues_Top10.rename(index=str, columns={" ": "Venue Category", "frequency": "Frequ
ency"}, inplace=True)

Calgary_Venues_Top10
```

Out[24]:

	Frequency
Coffee Shop	302
Fast Food Restaurant	155
Pub	152
Grocery Store	150
Pizza Place	148
Sandwich Place	115
Convenience Store	108
Liquor Store	100
Vietnamese Restaurant	99
Park	99

FILTER THE NEIGHBORHOODS BASED ON THE INTERESTS:

Let's filter the Neighborhoods in Accordance with the Interest of a young couple with an Active Dog

Interest 1: Grocery Store nearby

Interest 2: Fast Food Restaurant nearby

Interest 3: Park nearby

In [25]:

```python
# Let's filter the Neighborhoods in Accordance with the Interest of a young couple with an
Active Dog
# Interest 1: Grocery Store nearby
# Interest 2: Fast Food Restaurant nearby
# Interest 3: Park nearby
```

In [26]:

```python
# Interest 1: Grocery Store nearby
Calgary_fav = Calgary_merged.loc[(Calgary_merged['1st Most Common Venue'] == 'Fast Food Re
staurant') | (Calgary_merged['1st Most Common Venue'] == 'Grocery Store') | (Calgary_merge
d['1st Most Common Venue'] == 'Park')]
print(Calgary_fav.shape)
Calgary_fav
```

```
(40, 19)
```

Out[26]:

	Neighborhood	Sector	Ward	Type	Population	Area (km2)	Population Density	Latitude	Lon
4	Applewood Park	East	10	Residential	6498.0	1.6	4061.3	51.044658	-113.9
17	Brentwood	Northwest	7	Residential	6059.0	2.9	2089.3	51.098611	-114.
20	Britannia	Centre	11	Residential	803.0	0.5	1606	51.012540	-114.0
24	Castleridge	Northeast	5	Residential	6096.0	1.2	5080	51.105977	-113.9
32	Christie Park	West	6	Residential	2196.0	0.8	2745	51.038434	-114.
40	Cougar Ridge	West	6	Residential	5874.0	2.2	2670	51.070710	-114.2
42	Country Hills Village	North	3	Residential	2615.0	1.0	2615	51.157500	-114.0
43	Coventry Hills	North	3	Residential	15969.0	4.1	3894.9	51.163596	-114.0
47	Dalhousie	Northwest	7	Residential	9085.0	3.3	2753	51.106849	-114.
48	Deer Ridge	South	14	Residential	4084.0	1.4	2917.1	50.927276	-114.0
53	Dover	East	9	Residential	10474.0	4.2	2493.8	51.129980	-113.9
60	Elbow Park	Centre	8/11	Residential	3377.0	1.8	1876.1	51.020634	-114.0
67	Falconridge	Northeast	5	Residential	10381.0	2.2	4718.6	51.102692	-113.9
69	Forest Lawn	East	10	Residential	7487.0	2.3	3255.2	51.033333	-113.9
71	Glenbrook	West	6	Residential	7056.0	1.9	3713.7	51.023309	-114.
73	Greenview	North	4	Residential	1975.0	0.5	3950	51.093889	-114.0
76	Harvest Hills	North	3	Residential	7402.0	2.2	3364.5	51.148198	-114.0
81	Highwood	Centre	7	Residential	2214.0	0.9	2460	51.091547	-114.0
85	Huntington Hills	North	4	Residential	13213.0	4.8	2752.7	51.118724	-114.0

	Neighborhood	Sector	Ward	Type	Population	Area (km2)	Population Density	Latitude	Lon
92	Lakeview	West	11	Residential	5468.0	2.2	2485.5	50.994722	-114.
100	Marlborough	Northeast	10	Residential	8434.0	2.7	3123.7	51.059444	-113.9
113	Mount Pleasant	Centre	7	Residential	4851.0	1.9	2553.2	51.072500	-114.0
115	Nolan Hill	North	2	Residential	0.0	2.1	0	51.175000	-114.
117	North Haven	North	4	Residential	2288.0	0.8	2860	51.096111	-114.0
119	Oakridge	South	11	Residential	5651.0	2.4	2354.6	50.967778	-114.
120	Ogden	Southeast	9	Residential	8702.0	4.1	2122.4	50.967778	-114.
127	Penbrooke Meadows	East	10	Residential	8547.0	2.0	4273.5	51.047740	-113.9
131	Queens Park Village	Centre	7	Residential	415.0	0.6	691.7	51.086803	-114.0
132	Queensland	South	14	Residential	4771.0	1.6	2981.9	50.938056	-114.0
135	Red Carpet	East	10	Residential	1555.0	0.6	2591.7	51.041307	-113.9
140	Riverbend	Southeast	9	Residential	9684.0	4.1	2362	50.972778	-114.0
143	Rosemont	Centre	7	Residential	1241.0	0.5	2482	51.078056	-114.
144	Rosscarrock	West	8	Residential	3356.0	1.1	3050.9	51.042694	-114.
147	Rundle	Northeast	5	Residential	11258.0	2.6	4330	51.073233	-113.9
159	Sherwood	North	2	Residential	2523.0	2.4	1051.3	51.161000	-114.
162	Silverado	South	14	Residential	5136.0	5.1	1007.1	50.884366	-114.0
166	Southview	East	10	Residential	1900.0	1.6	1187.5	51.033892	-113.9
168	Springbank Hill	West	6	Residential	8783.0	6.3	1394.1	51.028926	-114.2
184	Varsity	Northwest	1	Residential	12200.0	6.8	1794.1	51.092222	-114.
192	Willow Park	South	14	Residential	5229.0	3.4	1537.9	50.960293	-114.0
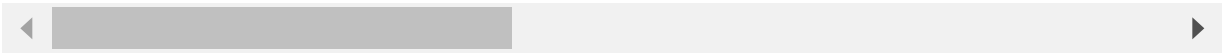
In [27]:

```python
# Sort the resultant Neighborhoods by the Most Populated ones:

Calgary_Fav = Calgary_fav.sort_values(['Population Density'])
Calgary_Fav = Calgary_Fav[Calgary_Fav.Population != 0]
Calgary_Fav
```

Out[27]:

	Neighborhood	Sector	Ward	Type	Population	Area (km2)	Population Density	Latitude	Lon
162	Silverado	South	14	Residential	5136.0	5.1	1007.1	50.884366	-114.0
159	Sherwood	North	2	Residential	2523.0	2.4	1051.3	51.161000	-114.
166	Southview	East	10	Residential	1900.0	1.6	1187.5	51.033892	-113.9
168	Springbank Hill	West	6	Residential	8783.0	6.3	1394.1	51.028926	-114.2
192	Willow Park	South	14	Residential	5229.0	3.4	1537.9	50.960293	-114.0
20	Britannia	Centre	11	Residential	803.0	0.5	1606	51.012540	-114.0
184	Varsity	Northwest	1	Residential	12200.0	6.8	1794.1	51.092222	-114.
60	Elbow Park	Centre	8/11	Residential	3377.0	1.8	1876.1	51.020634	-114.0
17	Brentwood	Northwest	7	Residential	6059.0	2.9	2089.3	51.098611	-114.
120	Ogden	Southeast	9	Residential	8702.0	4.1	2122.4	50.967778	-114.
119	Oakridge	South	11	Residential	5651.0	2.4	2354.6	50.967778	-114.
140	Riverbend	Southeast	9	Residential	9684.0	4.1	2362	50.972778	-114.0
81	Highwood	Centre	7	Residential	2214.0	0.9	2460	51.091547	-114.0
143	Rosemont	Centre	7	Residential	1241.0	0.5	2482	51.078056	-114.
92	Lakeview	West	11	Residential	5468.0	2.2	2485.5	50.994722	-114.
53	Dover	East	9	Residential	10474.0	4.2	2493.8	51.129980	-113.9
113	Mount Pleasant	Centre	7	Residential	4851.0	1.9	2553.2	51.072500	-114.0
135	Red Carpet	East	10	Residential	1555.0	0.6	2591.7	51.041307	-113.9
42	Country Hills Village	North	3	Residential	2615.0	1.0	2615	51.157500	-114.0

	Neighborhood	Sector	Ward	Type	Population	Area (km2)	Population Density	Latitude	Lon
40	Cougar Ridge	West	6	Residential	5874.0	2.2	2670	51.070710	-114.2
32	Christie Park	West	6	Residential	2196.0	0.8	2745	51.038434	-114.1
85	Huntington Hills	North	4	Residential	13213.0	4.8	2752.7	51.118724	-114.0
47	Dalhousie	Northwest	7	Residential	9085.0	3.3	2753	51.106849	-114.1
117	North Haven	North	4	Residential	2288.0	0.8	2860	51.096111	-114.0
48	Deer Ridge	South	14	Residential	4084.0	1.4	2917.1	50.927276	-114.0
132	Queensland	South	14	Residential	4771.0	1.6	2981.9	50.938056	-114.0
144	Rosscarrock	West	8	Residential	3356.0	1.1	3050.9	51.042694	-114.1
100	Marlborough	Northeast	10	Residential	8434.0	2.7	3123.7	51.059444	-113.9
69	Forest Lawn	East	10	Residential	7487.0	2.3	3255.2	51.033333	-113.9
76	Harvest Hills	North	3	Residential	7402.0	2.2	3364.5	51.148198	-114.0
71	Glenbrook	West	6	Residential	7056.0	1.9	3713.7	51.023309	-114.1
43	Coventry Hills	North	3	Residential	15969.0	4.1	3894.9	51.163596	-114.0
73	Greenview	North	4	Residential	1975.0	0.5	3950	51.093889	-114.0
4	Applewood Park	East	10	Residential	6498.0	1.6	4061.3	51.044658	-113.9
127	Penbrooke Meadows	East	10	Residential	8547.0	2.0	4273.5	51.047740	-113.9
147	Rundle	Northeast	5	Residential	11258.0	2.6	4330	51.073233	-113.9
67	Falconridge	Northeast	5	Residential	10381.0	2.2	4718.6	51.102692	-113.9
24	Castleridge	Northeast	5	Residential	6096.0	1.2	5080	51.105977	-113.9
131	Queens Park Village	Centre	7	Residential	415.0	0.6	691.7	51.086803	-114.0

FINAL DATA-FRAME CONTAINING LESS-DENSELY POPULATED NEIGHBORHOODS IN CALGARY THAT HAVE EITHER A GROCERY STORE/ FAST FOOD RESTAURANT/ PARK WITHIN THEIR MOST COMMON VENUES (LIMIT: 1000 m)

In [28]:

```python
# Finally, Let's filter the first 15 Neighborhoods that are within the standards and save
 them into a separate DF

Calgary_Top15 = Calgary_Fav.head(15)
Calgary_Top15
```

Out[28]:

	Neighborhood	Sector	Ward	Type	Population	Area (km2)	Population Density	Latitude	Lon
162	Silverado	South	14	Residential	5136.0	5.1	1007.1	50.884366	-114.(
159	Sherwood	North	2	Residential	2523.0	2.4	1051.3	51.161000	-114.1
166	Southview	East	10	Residential	1900.0	1.6	1187.5	51.033892	-113.9
168	Springbank Hill	West	6	Residential	8783.0	6.3	1394.1	51.028926	-114.2
192	Willow Park	South	14	Residential	5229.0	3.4	1537.9	50.960293	-114.(
20	Britannia	Centre	11	Residential	803.0	0.5	1606	51.012540	-114.(
184	Varsity	Northwest	1	Residential	12200.0	6.8	1794.1	51.092222	-114.1
60	Elbow Park	Centre	8/11	Residential	3377.0	1.8	1876.1	51.020634	-114.(
17	Brentwood	Northwest	7	Residential	6059.0	2.9	2089.3	51.098611	-114.1
120	Ogden	Southeast	9	Residential	8702.0	4.1	2122.4	50.967778	-114.1
119	Oakridge	South	11	Residential	5651.0	2.4	2354.6	50.967778	-114.1
140	Riverbend	Southeast	9	Residential	9684.0	4.1	2362	50.972778	-114.(
81	Highwood	Centre	7	Residential	2214.0	0.9	2460	51.091547	-114.(
143	Rosemont	Centre	7	Residential	1241.0	0.5	2482	51.078056	-114.
92	Lakeview	West	11	Residential	5468.0	2.2	2485.5	50.994722	-114.

Out[28]:

Improved Visualization: Less-Densely Populated Neighborhoods:

Silverado (South Side), Sherwood (North Side), and Southview (East Side)

In [53]:

```python
# Let's Visualize the Top 15 Neighborhood's Population Density

import matplotlib as mpl
import matplotlib.pyplot as plt

df_population = Calgary_Top15[['Neighborhood', 'Population Density']].copy()
df_population.head()
df_population[['Population Density']] = df_population[['Population Density']].astype(float)

df_population.plot(kind='bar', figsize=(10, 6))

plt.xlabel('Neighborhood') # add to x-label to the plot
plt.ylabel('Population Density') # add y-label to the plot
plt.title('Population Density in Chosen Calgary Neighborhoods') # add title to the plot

plt.show()
```
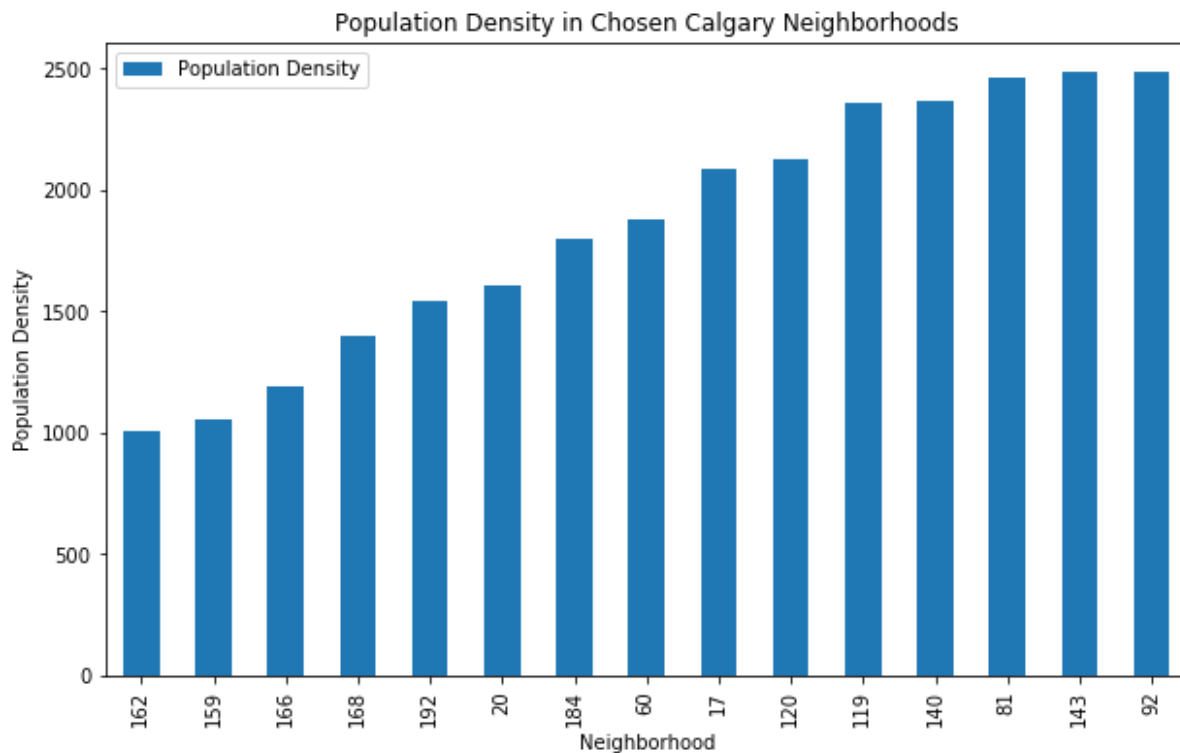
In [30]:

```python
#Fix the Final DataFrame to be able to Cluster the Information of the Top Neighborhoods

Calgary_TopFinal = Calgary_Top15.drop(['1st Most Common Venue', '2nd Most Common Venue',
'3rd Most Common Venue', '4th Most Common Venue', '5th Most Common Venue', '6th Most Commo
n Venue', '7th Most Common Venue', '8th Most Common Venue', '9th Most Common Venue', '10th
Most Common Venue'], axis=1)
Calgary_TopFinal.head()
```

Out[30]:

	Neighborhood	Sector	Ward	Type	Population	Area (km2)	Population Density	Latitude	Longit
162	Silverado	South	14	Residential	5136.0	5.1	1007.1	50.884366	-114.078
159	Sherwood	North	2	Residential	2523.0	2.4	1051.3	51.161000	-114.153
166	Southview	East	10	Residential	1900.0	1.6	1187.5	51.033892	-113.994
168	Springbank Hill	West	6	Residential	8783.0	6.3	1394.1	51.028926	-114.209
192	Willow Park	South	14	Residential	5229.0	3.4	1537.9	50.960293	-114.054

CALGARY NEIGHBORHOOD CLUSTERING: VENUES SIMILARITIES

This Visualization Tool will improve the insights on the previous Clustering Analysis. Neighborhoods represented with same-color marking will have similarities in their Venues

In [46]:

```python
#Start Calgary Top Neighborhoods Clustering Process
# Set number of clusters
kclusters = 3

Calgary_grouped_clustering = calgary_grouped.drop('Neighborhood', 1)

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

# check cluster labels generated for each row in the dataframe
kmeans.labels_[0:15]

# add clustering labels

neighborhoods_venues_sorted.insert(0, 'Cluster Label', kmeans.labels_)

Calgary_merged = Calgary_TopFinal

# merge Calgary_grouped with Calgary_data to add latitude/longitude for each neighborhood
Calgary_merged = Calgary_merged.join(neighborhoods_venues_sorted.set_index('Neighborhood'
), on='Neighborhood')

Calgary_merged.head(15) # check the last columns!
```
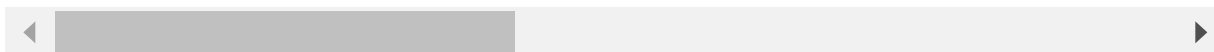
Out[46]:

	Neighborhood	Sector	Ward	Type	Population	Area (km2)	Population Density	Latitude	Lon
162	Silverado	South	14	Residential	5136.0	5.1	1007.1	50.884366	-114.0
159	Sherwood	North	2	Residential	2523.0	2.4	1051.3	51.161000	-114.1
166	Southview	East	10	Residential	1900.0	1.6	1187.5	51.033892	-113.9
168	Springbank Hill	West	6	Residential	8783.0	6.3	1394.1	51.028926	-114.2
192	Willow Park	South	14	Residential	5229.0	3.4	1537.9	50.960293	-114.0
20	Britannia	Centre	11	Residential	803.0	0.5	1606	51.012540	-114.0
184	Varsity	Northwest	1	Residential	12200.0	6.8	1794.1	51.092222	-114.1
60	Elbow Park	Centre	8/11	Residential	3377.0	1.8	1876.1	51.020634	-114.0
17	Brentwood	Northwest	7	Residential	6059.0	2.9	2089.3	51.098611	-114.1
120	Ogden	Southeast	9	Residential	8702.0	4.1	2122.4	50.967778	-114.1
119	Oakridge	South	11	Residential	5651.0	2.4	2354.6	50.967778	-114.1
140	Riverbend	Southeast	9	Residential	9684.0	4.1	2362	50.972778	-114.0
81	Highwood	Centre	7	Residential	2214.0	0.9	2460	51.091547	-114.0
143	Rosemont	Centre	7	Residential	1241.0	0.5	2482	51.078056	-114.
92	Lakeview	West	11	Residential	5468.0	2.2	2485.5	50.994722	-114.

In [48]:

```python
# 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(Calgary_merged['Latitude'], Calgary_merged['Longitude'],
Calgary_merged['Neighborhood'], Calgary_merged['Cluster Label']):
    label = folium.Popup(str(poi) + ' Cluster ' + str(cluster), parse_html=True)
    folium.CircleMarker(
        [lat, lon],
        radius=5,
        popup=label,
        color=rainbow[cluster-1],
        fill=True,
        fill_color=rainbow[cluster-1],
        fill_opacity=0.7).add_to(map_clusters)

map_clusters
```

Out[48]:

RESULTS SECTION

1. The Neighborhoods in Calgary were filtered in accordance with their main type. For the purpose of this study, neither Industrial, Major Parks Zones or Residual Areas were taken into account. Only Residential Neighborhoods were analyzed for the overall profile of their main Venues.

2. The Results obtained from this study indicate that either the Central or South sides of Calgary contain the majority of the Neighborhoods surrounded by Grocery Stores, Fast Food Restaurants or Parks; being these three types of venues the ones chosen by the author as main reasons to locate a proper place for living. These venue types can be easily changed to redirect the analysis and explore other results from the model.

3. In general, even though the Central and South sides of Calgary are more suitable to be inhabited in accordance with their venues, North side Neighborhoods with similar characteristics are less-densely populated, which can be a determining factor when thinking about peacefulness of the neighborhood. Silverado was found to be an exception of this observation.

4. It is more common to find a Neighborhood with surrounding Grocery Stores or Restaurants (in general) than parks. Therefore, If thinking about work out possibilities during summer, it would be more viable to choose a Neighborhood with acceptable profile and within a walking distance from a Major Park Zone.

DISCUSSION AND RECOMMENDATIONS

According to this analysis, Central and Southern sides of Calgary will provide the most appropriate Neighborhoods to live in when prioritizing the presence of Grocery Stores, Restaurants and Parks around. In spit of that, Central and Southern sides of Calgary are within the most populated areas, so this will not represent that they are the most peaceful ones. North Side on the contrary, can be less populated and more quiet area.

However, this analysis does not demonstrate the full capability of this model. First, Different analysis can be made: variation of the required Neighborhood profile, variation of the desired population density. Second, it can be complemented with Calgary's crime data, which will give a sense of the safety standards of each Neighborhood. Third, it can be complemented with Calgary's km2 price data, which will give a more comprehensive sense of the suitability of buying a property on each Neighborhood.

CONCLUSIONS

During the course of this project, users would be able to get a small glimpse of Data Science applied to solve a real problem. The power of Python libraries, combined with Foursquare API and Folium maps will allow data scientists and programmers to analyze infinite cases and solve almost any type of problem (if Data is available).

There are always special considerations, limitations and drawbacks, specially when it comes to Data Science's experience. This model is not intended to solve complex situations related to demographic behavior of Calgary's Neighborhoods, but it can become the first step on a more advanced project in this matter. I hope you've enjoyed it as much as I did.

In [ ]: