# Exploring High Schools

November 26, 2024

Exploring Schools In the Area

We will be further leveraging Foursquare to locate High Schools in our Chosen Neighbourhood. This will support our proposal for our business in Midtown Toronto and help us get more information about one of our Target Market - High School Students

[1]:
```
#import needed libraries
import requests
import pandas as pd
```

[2]:
```
# open file from Part 1 - Exploring Toronto Neighbourhoods
toronto_DF = pd.read_csv('exploring toronto neighbourhoods.csv')
```

[3]:
```
display(toronto_DF)
```

```
             Borough Postalcode  \
0    Central Toronto        M4N
1    Central Toronto        M4P
2    Central Toronto        M4R
3    Central Toronto        M4S
4    Central Toronto        M4T
..               …        …
98              York        M6C
99              York        M6E
100             York        M6M
101             York        M6N
102             York        M9N

                                    Neighbourhood   Latitude  Longitude
0                                    Lawrence Park  43.728020 -79.388790
1                                  Davisville North  43.712751 -79.390197
2                                North Toronto West  43.715383 -79.405678
3                                         Davisville  43.704324 -79.388790
4                           Moore Park / Summerhill East  43.689574 -79.383160
..                                                 …        …        …
98                                Humewood-Cedarvale  43.693781 -79.428191
99                               Caledonia-Fairbanks  43.689026 -79.453512
100  Del Ray / Mount Dennis / Keelsdale and Silvert…  43.691116 -79.476013
101                    Runnymede / The Junction North  43.673185 -79.487262
```

```
102                                    Weston  43.706876 -79.518188

[103 rows x 5 columns]
```

[4]:
```python
# Set up API key and other constants for Foursquare API
API_KEY = 'fsq3t+OW6hBVze7MGHEzJyy7agmYljQRdp9e7SzJC9vpmAk='
LIMIT = 20  # Maximum number of venues to return
radius = 2500  # Search radius in meters

# a function to loop through each neighbourhood in the exploring toronto␣
 ↪neighbourhoods.csv file, and search for places
def getNearbyVenues(names, postalcode, latitudes, longitudes, radius):
    venues_list = []

    for name, postalcode, lat, lng in zip(names, postalcode, latitudes,␣
 ↪longitudes):
        print(f"Processing neighborhood: {name}")

        # Skip if latitude or longitude is missing
        if pd.isnull(lat) or pd.isnull(lng):
            print(f"Skipping {name} due to missing latitude or longitude.")
            continue

        # Create the API request URL and parameters
        # We will be searching with categories ID 12059 - High Schools to␣
 ↪understand more about our Target Market
        url = 'https://api.foursquare.com/v3/places/search'
        params = {
            'll': f'{lat},{lng}',
            'radius': radius,
            'limit': LIMIT,
            'categories': 12059
        }

        # Set up headers with the API key
        headers = {
            "Accept": "application/json",
            "Authorization": 'fsq3t+OW6hBVze7MGHEzJyy7agmYljQRdp9e7SzJC9vpmAk='
        }

        # Make the GET request
        response = requests.get(url, headers=headers, params=params)

        # Check if the request was successful
        if response.status_code != 200:
            print(f"Failed to get data for {name}. Status code: {response.
 ↪status_code}")
```

```
            print(f"Error message: {response.text}")
            continue

        results = response.json()

        # Parse the JSON response
        for venue in results.get('results', []):
            # Extract venue information
            venue_name = venue.get('name')
            venue_id = venue.get('fsq_id')
            venue_location = venue.get('geocodes', {}).get('main', {})
            venue_lat = venue_location.get('latitude')
            venue_lng = venue_location.get('longitude')
            venue_categories = venue.get('categories', [])
            venue_category = venue_categories[0]['name'] if venue_categories␣
 ↪else 'Unknown'

            # Append to the list
            venues_list.append([
                name,
                postalcode,
                lat,
                lng,
                venue_name,
                venue_id,
                venue_lat,
                venue_lng,
                venue_category
            ])

    # Create a DataFrame from the list
    nearby_venues = pd.DataFrame(venues_list, columns=[
        'Neighbourhood',
        'Postalcode',
        'Neighborhood Latitude',
        'Neighborhood Longitude',
        'Venue',
        'fsq_id',
        'Venue Latitude',
        'Venue Longitude',
        'Venue Category'
    ])

    return nearby_venues

#setting up
toronto_venues = getNearbyVenues(
```

```
    names=toronto_DF['Neighbourhood'],
    postalcode=toronto_DF['Postalcode'],
    latitudes=toronto_DF['Latitude'],
    longitudes=toronto_DF['Longitude'],
    radius=radius
)

# Display the first few rows of the resulting DataFrame
toronto_venues.head()
```

```
Processing neighborhood: Lawrence Park
Processing neighborhood: Davisville North
Processing neighborhood: North Toronto West
Processing neighborhood: Davisville
Processing neighborhood: Moore Park / Summerhill East
Processing neighborhood: Summerhill West / Rathnelly / South Hill / Forest Hill
SE / Deer Park
Processing neighborhood: Roselawn
Processing neighborhood: Forest Hill North & West
Processing neighborhood: The Annex / North Midtown / Yorkville
Processing neighborhood: Flemingdon Par
Processing neighborhood: CFB Toront
Processing neighborhood: Rosedale
Processing neighborhood: St. James Town / Cabbagetown
Processing neighborhood: Church and Wellesley
Processing neighborhood: Regent Park / Harbourfront
Processing neighborhood: Garden District, Ryerson
Processing neighborhood: St. James Town
Processing neighborhood: Berczy Park
Processing neighborhood: Central Bay Street
Processing neighborhood: Richmond / Adelaide / King
Processing neighborhood: Harbourfront East / Union Station / Toronto Islands
Processing neighborhood: Toronto Dominion Centre / Design Exchange
Processing neighborhood: Commerce Court / Victoria Hotel
Processing neighborhood: University of Toronto / Harbord
Processing neighborhood: Kensington Market / Chinatown / Grange Park
Processing neighborhood: CN Tower / King and Spadina / Railway Lands /
Harbourfront West / Bathurst Quay / South Niagara / Island airport
Processing neighborhood: First Canadian Place / Underground city
Processing neighborhood: Christie
Processing neighborhood: Enclave of M5E
Processing neighborhood: The Beaches
Processing neighborhood: The Danforth West / Riverdale
Processing neighborhood: India Bazaar / The Beaches West
Processing neighborhood: Studio District
Processing neighborhood: Enclave of M4L
Processing neighborhood: Parkview Hill / Woodbine Gardens
```

```
Processing neighborhood: Woodbine Heights
Processing neighborhood: Leaside
Processing neighborhood: Thorncliffe Park
Processing neighborhood: The Danforth East
Processing neighborhood: New Toronto / Mimico South / Humber Bay Shores
Processing neighborhood: Alderwood / Long Branch
Processing neighborhood: The Kingsway / Montgomery Road / Old Mill North
Processing neighborhood: Old Mill South / King's Mill Park / Sunnylea / Humber
Bay / Mimico NE / The Queensway East / Royal York South East / Kingsway Park
South East
Processing neighborhood: Mimico NW / The Queensway West / South of Bloor /
Kingsway Park South West / Royal York South West
Processing neighborhood: Islington Avenue
Processing neighborhood: West Deane Park / Princess Gardens / Martin Grove /
Islington / Cloverdale
Processing neighborhood: Eringate / Bloordale Gardens / Old Burnhamthorpe /
Markland Wood
Processing neighborhood: Westmount
Processing neighborhood: Kingsview Village / St. Phillips / Martin Grove Gardens
/ Richview Gardens
Processing neighborhood: South Steeles / Silverstone / Humbergate / Jamestown /
Mount Olive / Beaumond Heights / Thistletown / Albion Gardens
Processing neighborhood: Clairville / Humberwood / Woodbine Downs / West Humber
/ Kipling Heights / Rexdale / Elms / Tandridge / Old Rexdale
Processing neighborhood: Enclave of L4W
Processing neighborhood: Hillcrest Village
Processing neighborhood: Fairview / Henry Farm / Oriole
Processing neighborhood: Bayview Village
Processing neighborhood: York Mills / Silver Hills
Processing neighborhood: Willowdale / Newtonbrook
Processing neighborhood: Willowdale South
Processing neighborhood: York Mills West
Processing neighborhood: Willowdale West
Processing neighborhood: Parkwoods
Processing neighborhood: Don Mills North
Processing neighborhood: Bathurst Manor / Wilson Heights / Downsview North
Processing neighborhood: Northwood Park / York University
Processing neighborhood: Downsview West
Processing neighborhood: Downsview Central
Processing neighborhood: Downsview Northwest
Processing neighborhood: Victoria Village
Processing neighborhood: Bedford Park / Lawrence Manor East
Processing neighborhood: Lawrence Manor / Lawrence Heights
Processing neighborhood: Glencairn
Processing neighborhood: North Park / Maple Leaf Park / Upwood Park
Processing neighborhood: Humber Summit
Processing neighborhood: Humberlea / Emery
Processing neighborhood: Ontario Provincial Government
```

```
Processing neighborhood: Malvern / Rouge
Processing neighborhood: Rouge Hill / Port Union / Highland Creek
Processing neighborhood: Guildwood / Morningside / West Hill
Processing neighborhood: Woburn
Processing neighborhood: Cedarbrae
Processing neighborhood: Scarborough Village
Processing neighborhood: Kennedy Park / Ionview / East Birchmount Park
Processing neighborhood: Golden Mile / Clairlea / Oakridge
Processing neighborhood: Cliffside / Cliffcrest / Scarborough Village West
Processing neighborhood: Birch Cliff / Cliffside West
Processing neighborhood: Dorset Park / Wexford Heights / Scarborough Town Centre
Processing neighborhood: Wexford / Maryvale
Processing neighborhood: Agincourt
Processing neighborhood: Clarks Corners / Tam OShanter / Sullivan
Processing neighborhood: Milliken / Agincourt North / Steeles East / LAmoreaux
East
Processing neighborhood: Steeles West / LAmoreaux West
Processing neighborhood: Upper Rouge
Processing neighborhood: Dufferin / Dovercourt Village
Processing neighborhood: Little Portugal / Trinity
Processing neighborhood: Brockton / Parkdale Village / Exhibition Place
Processing neighborhood: High Park / The Junction South
Processing neighborhood: Parkdale / Roncesvalles
Processing neighborhood: Runnymede / Swansea
Processing neighborhood: Humewood-Cedarvale
Processing neighborhood: Caledonia-Fairbanks
Processing neighborhood: Del Ray / Mount Dennis / Keelsdale and Silverthorn
Processing neighborhood: Runnymede / The Junction North
Processing neighborhood: Weston
```

[4]:

| | Neighbourhood | Postalcode | Neighborhood Latitude | Neighborhood Longitude | \ |
|---|---|---|---|---|---|
| 0 | Lawrence Park | M4N | 43.72802 | -79.38879 | |
| 1 | Lawrence Park | M4N | 43.72802 | -79.38879 | |
| 2 | Lawrence Park | M4N | 43.72802 | -79.38879 | |
| 3 | Lawrence Park | M4N | 43.72802 | -79.38879 | |
| 4 | Lawrence Park | M4N | 43.72802 | -79.38879 | |

| | Venue | fsq_id | \ |
|---|---|---|---|
| 0 | Blyth Academy, Lawrence Park | 4dbac22e81548ee14d7fdbe9 | |
| 1 | Lawrence Park Collegiate Institute | 4baa99ebf964a52085783ae3 | |
| 2 | The Math Guru | 507cb0e0fe7070e8a6ea78fb | |
| 3 | St Clement's School | 4bc61a8fd35d9c74582be23a | |
| 4 | North Toronto Collegiate Institute | 4d2f1749b97cb1f7e8209548 | |

| | Venue Latitude | Venue Longitude | Venue Category |
|---|---|---|---|
| 0 | 43.730361 | -79.403866 | High School |
| 1 | 43.722289 | -79.410583 | High School |

```
2       43.713046       -79.399415    High School
3       43.712514       -79.400547    High School
4       43.709209       -79.396556    High School
```

[5]:
```
# The total number of high schools in Toronto
toronto_venues['Venue'].nunique()
```

[5]:
```
162
```

[6]:
```
# Oberserving the number of competitors in each neighbourhood
toronto_venues.groupby('Neighbourhood')['Venue'].count()
```

[6]:
```
Neighbourhood
Agincourt                                          7
Alderwood / Long Branch                            3
Bathurst Manor / Wilson Heights / Downsview North  5
Bayview Village                                    1
Bedford Park / Lawrence Manor East                 6
                                                  ..
Willowdale West                                    6
Woburn                                             5
Woodbine Heights                                  10
York Mills / Silver Hills                          5
York Mills West                                    8
Name: Venue, Length: 101, dtype: int64
```

### 0.0.1 Part 2. Interactive leaflet map using coordinate data.

[7]:
```
import folium # map rendering library
```

[8]:
```
# High Schools in Lawrence Park
target = 'Lawrence Park'

search_area = toronto_venues[toronto_venues['Neighbourhood'] == target]
latitude = toronto_DF[toronto_DF['Neighbourhood'] == target]['Latitude']
longitude = toronto_DF[toronto_DF['Neighbourhood'] == target]['Longitude']
display(search_area)
```

```
   Neighbourhood Postalcode  Neighborhood Latitude  Neighborhood Longitude  \
0  Lawrence Park        M4N               43.72802               -79.38879
1  Lawrence Park        M4N               43.72802               -79.38879
2  Lawrence Park        M4N               43.72802               -79.38879
3  Lawrence Park        M4N               43.72802               -79.38879
4  Lawrence Park        M4N               43.72802               -79.38879
5  Lawrence Park        M4N               43.72802               -79.38879
6  Lawrence Park        M4N               43.72802               -79.38879
```

```
                                Venue                    fsq_id  \
0        Blyth Academy, Lawrence Park  4dbac22e81548ee14d7fdbe9
1  Lawrence Park Collegiate Institute  4baa99ebf964a52085783ae3
2                       The Math Guru  507cb0e0fe7070e8a6ea78fb
3                  St Clement's School  4bc61a8fd35d9c74582be23a
4  North Toronto Collegiate Institute  4d2f1749b97cb1f7e8209548
5                     North Toronto CI  4b1a6cedf964a52032ea23e3
6                  Leaside High School  4bfe9d9d369476b02b8c8c1f

   Venue Latitude  Venue Longitude Venue Category
0       43.730361       -79.403866    High School
1       43.722289       -79.410583    High School
2       43.713046       -79.399415    High School
3       43.712514       -79.400547    High School
4       43.709209       -79.396556    High School
5       43.708536       -79.396542    High School
6       43.711143       -79.372991    High School
```

[9]:
```
# Display map to visualise locations of high schools to aid our decision of␣
 ↪location
map_toronto = folium.Map(location=[latitude, longitude], zoom_start=14)

# add markers to map
for lat, lng, venue, neighborhood in zip(search_area['Venue Latitude'],␣
 ↪search_area['Venue Longitude'], search_area['Venue'],␣
 ↪search_area['Neighbourhood']):
    label = '{},{}'.format(venue, neighborhood)
    label = folium.Popup(label, parse_html=True)
    folium.CircleMarker(
        [lat, lng],
        radius=5,
        popup=label,
        color='red',
        fill=True,
        fill_color='red',
        fill_opacity=0.7,
        parse_html=False).add_to(map_toronto)

map_toronto
```

```
/opt/conda/lib/python3.11/site-packages/folium/utilities.py:94: FutureWarning:
Calling float on a single element Series is deprecated and will raise a
TypeError in the future. Use float(ser.iloc[0]) instead
  float(coord)
/opt/conda/lib/python3.11/site-packages/folium/utilities.py:100: FutureWarning:
Calling float on a single element Series is deprecated and will raise a
TypeError in the future. Use float(ser.iloc[0]) instead
  if math.isnan(float(coord)):
```

```
/opt/conda/lib/python3.11/site-packages/folium/utilities.py:102: FutureWarning:
Calling float on a single element Series is deprecated and will raise a
TypeError in the future. Use float(ser.iloc[0]) instead
  return [float(x) for x in coords]
```

[9]: <folium.folium.Map at 0x7f90e4cfe7d0>