

Capstone Project - The Battle of the Neighborhoods (Week 2)

Applied Data Science Capstone by IBM/Coursera

Table of Contents

- [Introduction: Business Problem](#)
- [Data](#)
- [Analysis](#)
- [Results and Discussion](#)
- [Conclusion](#)

Introduction: Business Problem

In this project we will compare the top 5 drinking locations in New York City (NYC) to Toronto. Specifically, this report will be targeted to stakeholders interested in drinking places in NYC versus Toronto to determine which city has better drinks.

Only the top 5 drinking places will be considered for each city. The data will be scraped from Foursquare and will be sort by popularity. Data to consider assessing will include price, rating and number of likes. Additional unique features may also be taken into consideration.

Data

Based on our defined business problem, factors that will influence our decisions are:

- Price
- Rating
- Number of Likes
- Unique features if any

```
In [7]: #Import the needed libraries
import requests
import pandas as pd
import numpy as np
import random
!conda install -c conda-forge geopy --yes
from geopy.geocoders import Nominatim

from IPython.display import Image
from IPython.core.display import HTML

from pandas.io.json import json_normalize

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

print('Folium installed')
print('Libraries imported.')
```

Collecting package metadata (current_repodata.json): done
Solving environment: done

All requested packages already installed.

Collecting package metadata (current_repodata.json): done
Solving environment: done

All requested packages already installed.

Folium installed
Libraries imported.

```
In [12]: CLIENT_ID = '1DMKQ5NQ5VMJLWX5GSWMA0HGJCXJMWBY3GURRVXVD3MQMLW'
CLIENT_SECRET = 'OFVFGV1NCWSYF5X5B0S4ZTJYE4GPK4FYOX2MYJ1AV1NAUNUU'
VERSION = '20180604'
print('Your credentails:')
print('CLIENT_ID: ' + CLIENT_ID)
print('CLIENT_SECRET: ' + CLIENT_SECRET)
```

Your credentails:
CLIENT_ID: 1DMKQ5NQ5VMJLWX5GSWMA0HGJCXJMWBY3GURRVXVD3MQMLW
CLIENT_SECRET:OFVFGV1NCWSYF5X5B0S4ZTJYE4GPK4FYOX2MYJ1AV1NAUNUU

```
In [8]: geolocator = Nominatim(user_agent="foursquare_agent")
location = geolocator.geocode('New York City, NY')
latitude = location.latitude
longitude = location.longitude
print(latitude, longitude)
```

40.7127281 -74.0060152

```
In [9]: radius = 500
```

```
In [13]: nyc_drinks_url = 'https://api.foursquare.com/v2/venues/explore?ll=40.7127281,-74.0060152&section=drinks&sortByPopularity=0&limit=5&client_id={}&client_secret={}&v={}&radius={}'.format(CLIENT_ID, CLIENT_SECRET, VERSION, radius)
nyc_drinks_result = requests.get(nyc_drinks_url).json()
nyc_drinks_result
```

```

Out[13]: {'meta': {'code': 200, 'requestId': '5e33813db57e88001bf54b50'},
  'response': {'suggestedFilters': {'header': 'Tap to show:',
    'filters': [{'name': '$-$$$$', 'key': 'price'},
      {'name': 'Open now', 'key': 'openNow'}]},
    'headerLocation': 'Downtown Manhattan',
    'headerFullLocation': 'Downtown Manhattan, New York',
    'headerLocationGranularity': 'neighborhood',
    'query': 'drinks',
    'totalResults': 41,
    'suggestedBounds': {'ne': {'lat': 40.7172281045, 'lng': -74.000089520
63419},
      'sw': {'lat': 40.7082280955, 'lng': -74.0119408793658}},
    'groups': [{'type': 'Recommended Places',
      'name': 'recommended',
      'items': [{'reasons': {'count': 0,
        'items': [{'summary': 'This spot is popular',
          'type': 'general',
          'reasonName': 'globalInteractionReason'}]}],
      'venue': {'id': '57f0689d498e7d49d9189369',
        'name': 'The Bar Room at Temple Court',
        'location': {'address': '123 Nassau St',
          'lat': 40.7114477287544,
          'lng': -74.00680157032005,
          'labeledLatLngs': [{'label': 'display',
            'lat': 40.7114477287544,
            'lng': -74.00680157032005}]},
        'distance': 157,
        'postalCode': '10038',
        'cc': 'US',
        'neighborhood': 'Financial District',
        'city': 'New York',
        'state': 'NY',
        'country': 'United States',
        'formattedAddress': ['123 Nassau St',
          'New York, NY 10038',
          'United States']},
        'categories': [{'id': '4bf58dd8d48988d1d5941735',
          'name': 'Hotel Bar',
          'pluralName': 'Hotel Bars',
          'shortName': 'Hotel Bar',
          'icon': {'prefix': 'https://ss3.4sqi.net/img/categories_v2/travel/hotel_bar_',
            'suffix': '.png'},
            'primary': True}],
            'photos': {'count': 0, 'groups': []}},
            'referralId': 'e-4-57f0689d498e7d49d9189369-0'},
            {'reasons': {'count': 0,
              'items': [{'summary': 'This spot is popular',
                'type': 'general',
                'reasonName': 'globalInteractionReason'}]}],
              'venue': {'id': '534c9d7b498e1bdd443a40e1',
                'name': 'Racines',
                'location': {'address': '94 Chambers St',
                  'lat': 40.714754151461236,
                  'lng': -74.0075806002039,
                  'labeledLatLngs': [{'label': 'display',
                    'lat': 40.714754151461236,

```

```

    'lng': -74.0075806002039}],
    'distance': 261,
    'postalCode': '10007',
    'cc': 'US',
    'city': 'New York',
    'state': 'NY',
    'country': 'United States',
    'formattedAddress': ['94 Chambers St',
    'New York, NY 10007',
    'United States']],
    'categories': [{ 'id': '4bf58dd8d48988d10c941735',
    'name': 'French Restaurant',
    'pluralName': 'French Restaurants',
    'shortName': 'French',
    'icon': { 'prefix': 'https://ss3.4sqi.net/img/categories_v2/food/french_',
    'suffix': '.png'},
    'primary': True}],
    'photos': { 'count': 0, 'groups': []},
    'referralId': 'e-4-534c9d7b498e1bdd443a40e1-1'},
    { 'reasons': { 'count': 0,
    'items': [{ 'summary': 'This spot is popular',
    'type': 'general',
    'reasonName': 'globalInteractionReason' } ]},
    'venue': { 'id': '4db5fbfe43a1369cb5dc2a1f',
    'name': "Maxwell's Bar & Restaurant",
    'location': { 'address': '59 Reade St',
    'crossStreet': 'at Broadway',
    'lat': 40.71494392643706,
    'lng': -74.00648461952706,
    'labeledLatLngs': [{ 'label': 'display',
    'lat': 40.71494392643706,
    'lng': -74.00648461952706 } ]},
    'distance': 249,
    'postalCode': '10007',
    'cc': 'US',
    'city': 'New York',
    'state': 'NY',
    'country': 'United States',
    'formattedAddress': ['59 Reade St (at Broadway)',
    'New York, NY 10007',
    'United States']],
    'categories': [{ 'id': '4bf58dd8d48988d116941735',
    'name': 'Bar',
    'pluralName': 'Bars',
    'shortName': 'Bar',
    'icon': { 'prefix': 'https://ss3.4sqi.net/img/categories_v2/nightlife/pub_',
    'suffix': '.png'},
    'primary': True}],
    'delivery': { 'id': '315611',
    'url': 'https://www.seamless.com/menu/maxwells-59-rea-de-st-new-york/315611?affiliate=1131&utm_source=foursquare-affiliate-network&utm_medium=affiliate&utm_campaign=1131&utm_content=315611',
    'provider': { 'name': 'seamless',
    'icon': { 'prefix': 'https://fastly.4sqi.net/img/general/cap/',
    'sizes': [40, 50],

```

```

    'name': '/delivery_provider_seamless_20180129.png'}}},
    'photos': {'count': 0, 'groups': []},
    'venuePage': {'id': '45470725'}},
    'referralId': 'e-4-4db5fbfe43a1369cb5dc2a1f-2'},
    {'reasons': {'count': 0,
    'items': [{'summary': 'This spot is popular',
    'type': 'general',
    'reasonName': 'globalInteractionReason'}]},
    'venue': {'id': '4aa0669cf964a5207e3f20e3',
    'name': 'The Wooly',
    'location': {'address': '11 Barclay St',
    'crossStreet': 'at Broadway',
    'lat': 40.712212455153555,
    'lng': -74.00835715252087,
    'labeledLatLngs': [{'label': 'display',
    'lat': 40.712212455153555,
    'lng': -74.00835715252087}]},
    'distance': 205,
    'postalCode': '10279',
    'cc': 'US',
    'city': 'New York',
    'state': 'NY',
    'country': 'United States',
    'formattedAddress': ['11 Barclay St (at Broadway)',
    'New York, NY 10279',
    'United States']},
    'categories': [{'id': '4bf58dd8d48988d171941735',
    'name': 'Event Space',
    'pluralName': 'Event Spaces',
    'shortName': 'Event Space',
    'icon': {'prefix': 'https://ss3.4sqi.net/img/categories_v2/bui
lding/eventspace_',
    'suffix': '.png'},
    'primary': True}],
    'delivery': {'id': '1085252',
    'url': 'https://www.grubhub.com/restaurant/the-wooly-public-233
-broadway-new-york/1085252?affiliate=1131&utm_source=foursquare-affilia
te-network&utm_medium=affiliate&utm_campaign=1131&utm_content=1085252',
    'provider': {'name': 'grubhub',
    'icon': {'prefix': 'https://fastly.4sqi.net/img/general/cap/',
    'sizes': [40, 50],
    'name': '/delivery_provider_grubhub_20180129.png'}}},
    'photos': {'count': 0, 'groups': []},
    'venuePage': {'id': '82838739'}},
    'referralId': 'e-4-4aa0669cf964a5207e3f20e3-3'},
    {'reasons': {'count': 0,
    'items': [{'summary': 'This spot is popular',
    'type': 'general',
    'reasonName': 'globalInteractionReason'}]},
    'venue': {'id': '433b2e80f964a52036281fe3',
    'name': 'FlashDancers Downtown',
    'location': {'address': '59 Murray St',
    'crossStreet': 'Church St & West Broadway',
    'lat': 40.71435,
    'lng': -74.0098,
    'labeledLatLngs': [{'label': 'display',
    'lat': 40.71435,

```

```
        'lng': -74.0098}],
        'distance': 366,
        'postalCode': '10007',
        'cc': 'US',
        'city': 'New York',
        'state': 'NY',
        'country': 'United States',
        'formattedAddress': ['59 Murray St (Church St & West Broadwa
Y)',
        'New York, NY 10007',
        'United States']},
        'categories': [{'id': '4bf58dd8d48988d1d6941735',
        'name': 'Strip Club',
        'pluralName': 'Strip Clubs',
        'shortName': 'Strip Club',
        'icon': {'prefix': 'https://ss3.4sqi.net/img/categories_v2/nig
htlife/stripclub_',
        'suffix': '.png'},
        'primary': True}],
        'photos': {'count': 0, 'groups': []},
        'venuePage': {'id': '79597613'}},
        'referralId': 'e-4-433b2e80f964a52036281fe3-4'}}]]]]}
```

```
In [14]: nyc_venue = nyc_drinks_result['response'][0]['groups'][0]['items']
nyc_drinks_df = json_normalize(nyc_venue)
nyc_drinks_df
```

Out[14]:

	referralId	reasons.count	reasons.items	venue.id	venue.
0	57f0689d498e7d49d9189369-e-4-0	0	[[{'summary': 'This spot is popular', 'type': '...'}]]	57f0689d498e7d49d9189369	Trinity Rooftop Temple
1	534c9d7b498e1bdd443a40e1-e-4-1	0	[[{'summary': 'This spot is popular', 'type': '...'}]]	534c9d7b498e1bdd443a40e1	Reverend
2	4db5fbfe43a1369cb5dc2a1f-e-4-2	0	[[{'summary': 'This spot is popular', 'type': '...'}]]	4db5fbfe43a1369cb5dc2a1f	Max's Restaurant
3	4aa0669cf964a5207e3f20e3-e-4-3	0	[[{'summary': 'This spot is popular', 'type': '...'}]]	4aa0669cf964a5207e3f20e3	The ...
4	433b2e80f964a52036281fe3-e-4-4	0	[[{'summary': 'This spot is popular', 'type': '...'}]]	433b2e80f964a52036281fe3	FlashDance Downtown

5 rows × 28 columns

```
In [15]: #overviewing the columns to see if there are unique features we can pull
list(nyc_drinks_df.columns)
```

```
Out[15]: ['referralId',
'reasons.count',
'reasons.items',
'venue.id',
'venue.name',
'venue.location.address',
'venue.location.lat',
'venue.location.lng',
'venue.location.labeledLatLngs',
'venue.location.distance',
'venue.location.postalCode',
'venue.location.cc',
'venue.location.neighborhood',
'venue.location.city',
'venue.location.state',
'venue.location.country',
'venue.location.formattedAddress',
'venue.categories',
'venue.photos.count',
'venue.photos.groups',
'venue.location.crossStreet',
'venue.delivery.id',
'venue.delivery.url',
'venue.delivery.provider.name',
'venue.delivery.provider.icon.prefix',
'venue.delivery.provider.icon.sizes',
'venue.delivery.provider.icon.name',
'venue.venuePage.id']
```

```
In [16]: nyc_drinks2_df = nyc_drinks_df[['venue.id', 'venue.name', 'venue.location.
lat', 'venue.location.lng', 'venue.location.formattedAddress', 'venue.de
livery.url']]
nyc_drinks2_df
```

```
Out[16]:
```

		venue.id	venue.name	venue.location.lat	venue.location.lng	venue.location.f
0	57f0689d498e7d49d9189369	The Bar Room at Temple Court	40.711448	-74.006802	[123 Nassau 1	
1	534c9d7b498e1bdd443a40e1	Racines	40.714754	-74.007581	[94 Chamber	
2	4db5fbfe43a1369cb5dc2a1f	Maxwell's Bar & Restaurant	40.714944	-74.006485	[59 Reade St (
3	4aa0669cf964a5207e3f20e3	The Wooly	40.712212	-74.008357	[11 Barclay St (
4	433b2e80f964a52036281fe3	FlashDancers Downtown	40.714350	-74.009800	[59 Murray St	


```
In [17]: nyc_venues_id_list = nyc_drinks_df['venue.id'].values.tolist()
nyc_venues_id_list
```

```
Out[17]: ['57f0689d498e7d49d9189369',
'534c9d7b498e1bdd443a40e1',
'4db5fbfe43a1369cb5dc2a1f',
'4aa0669cf964a5207e3f20e3',
'433b2e80f964a52036281fe3']
```

```
In [18]: nyc_rating = []
nyc_price = []
nyc_likes = []

for nyc_venues1 in nyc_venues_id_list:
    url2 = 'https://api.foursquare.com/v2/venues/{}?client_id={} & client_
secret={} & v={} '.format(nyc_venues1, CLIENT_ID, CLIENT_SECRET, VERSION)
    result2 = requests.get(url2).json()
    result4 = result2['response']['venue']['rating']
    result5 = result2['response']['venue']['attributes']['groups'][0]['s
ummary']
    result6 = result2['response']['venue']['likes']['count']
    nyc_rating.append(result4)
    nyc_price.append(result5)
    nyc_likes.append(result6)

nyc_rpl = pd.DataFrame({'Price': nyc_price, 'Rating': nyc_rating, 'Numbe
r of likes': nyc_likes})
nyc_rpl
```

```
Out[18]:
```

	Price	Rating	Number of likes
0	\$\$\$	9.4	182
1	\$\$\$	8.6	115
2	\$\$	8.1	165
3	\$\$\$	7.8	173
4	\$\$\$	8.7	87

```
In [19]: nyc_v1 = pd.concat([nyc_drinks2_df, nyc_rpl], axis=1)
nyc_v1
```

Out[19]:

		venue.id	venue.name	venue.location.lat	venue.location.lng	venue.location.f
0	57f0689d498e7d49d9189369		The Bar Room at Temple Court	40.711448	-74.006802	[123 Nassau 1
1	534c9d7b498e1bdd443a40e1		Racines	40.714754	-74.007581	[94 Chamber
2	4db5fbfe43a1369cb5dc2a1f		Maxwell's Bar & Restaurant	40.714944	-74.006485	[59 Reade St (
3	4aa0669cf964a5207e3f20e3		The Wooly	40.712212	-74.008357	[11 Barclay St (
4	433b2e80f964a52036281fe3		FlashDancers Downtown	40.714350	-74.009800	[59 Murray St

```
In [20]: #renaming columns and replacing NaN values
nyc_v2 = nyc_v1.rename(columns={"venue.id": "ID", "venue.name": "Venue",
"venue.location.lat": "Latitude", "venue.location.lng": "Longitude", "venue.location.formattedAddress": "Address", "venue.delivery.url": "Delivery url"})
nyc_v2.fillna("Not available", inplace = True)
```

```
In [22]: #price range per Foursquare
nyc_v3 = nyc_v2.replace({'$$': '$10-$20', '$$$': '$20-$30'})
```

```
In [23]: geolocator2 = Nominatim(user_agent="foursquare_agent")
location2 = geolocator2.geocode('Toronto, ON')
latitude2 = location2.latitude
longitude2 = location2.longitude
print(latitude2, longitude2)
```

43.653963 -79.387207

```
In [24]: toronto_drinks_url = 'https://api.foursquare.com/v2/venues/explore?ll=4
3.653963,-79.387207&section=drinks&sortByPopularity=0&limit=5&client_id=
{}&client_secret={}&v={}&radius={}'.format(CLIENT_ID, CLIENT_SECRET, VER
SION, radius)
toronto_drinks_result = requests.get(toronto_drinks_url).json()
toronto_drinks_result
```

```

Out[24]: {'meta': {'code': 200, 'requestId': '5e3382320de0d9001b1aaa1a'},
  'response': {'suggestedFilters': {'header': 'Tap to show:',
    'filters': [{'name': 'Open now', 'key': 'openNow'}]},
    'headerLocation': 'Bay Street Corridor',
    'headerFullLocation': 'Bay Street Corridor, Toronto',
    'headerLocationGranularity': 'neighborhood',
    'query': 'drinks',
    'totalResults': 13,
    'suggestedBounds': {'ne': {'lat': 43.6584630045, 'lng': -79.380999030
84075},
      'sw': {'lat': 43.649462995499995, 'lng': -79.39341496915925}},
    'groups': [{'type': 'Recommended Places',
      'name': 'recommended',
      'items': [{'reasons': {'count': 0,
        'items': [{'summary': 'This spot is popular',
          'type': 'general',
          'reasonName': 'globalInteractionReason'}]}],
      'venue': {'id': '4ad7bf71f964a5205b0e21e3',
        'name': 'Sin and Redemption',
        'location': {'address': '136 McCaul St.',
          'crossStreet': 'at Dundas St.',
          'lat': 43.65466135819523,
          'lng': -79.39173728227614,
          'labeledLatLngs': [{'label': 'display',
            'lat': 43.65466135819523,
            'lng': -79.39173728227614}]},
        'distance': 373,
        'postalCode': 'M5T 1W2',
        'cc': 'CA',
        'city': 'Toronto',
        'state': 'ON',
        'country': 'Canada',
        'formattedAddress': ['136 McCaul St. (at Dundas St.)',
          'Toronto ON M5T 1W2',
          'Canada']},
      'categories': [{'id': '4bf58dd8d48988d116941735',
        'name': 'Bar',
        'pluralName': 'Bars',
        'shortName': 'Bar',
        'icon': {'prefix': 'https://ss3.4sqi.net/img/categories_v2/nig
htlife/pub_',
          'suffix': '.png'},
        'primary': True}],
      'photos': {'count': 0, 'groups': []}},
      'referralId': 'e-4-4ad7bf71f964a5205b0e21e3-0'},
    {'reasons': {'count': 0,
      'items': [{'summary': 'This spot is popular',
        'type': 'general',
        'reasonName': 'globalInteractionReason'}]}],
      'venue': {'id': '4ab2b0b9f964a520e56b20e3',
        'name': 'The Queen and Beaver Public House',
        'location': {'address': '35 Elm St.',
          'crossStreet': 'at Bay St.',
          'lat': 43.65747228208784,
          'lng': -79.38352412327917,
          'labeledLatLngs': [{'label': 'display',
            'lat': 43.65747228208784,

```

```

    'lng': -79.38352412327917}],
    'distance': 490,
    'postalCode': 'M5G 1H1',
    'cc': 'CA',
    'city': 'Toronto',
    'state': 'ON',
    'country': 'Canada',
    'formattedAddress': ['35 Elm St. (at Bay St.)',
    'Toronto ON M5G 1H1',
    'Canada']],
    'categories': [{'id': '4bf58dd8d48988d155941735',
    'name': 'Gastropub',
    'pluralName': 'Gastropubs',
    'shortName': 'Gastropub',
    'icon': {'prefix': 'https://ss3.4sqi.net/img/categories_v2/food/gastropub_',
    'suffix': '.png'},
    'primary': True}],
    'photos': {'count': 0, 'groups': []},
    'referralId': 'e-4-4ab2b0b9f964a520e56b20e3-1'},
    {'reasons': {'count': 0,
    'items': [{'summary': 'This spot is popular',
    'type': 'general',
    'reasonName': 'globalInteractionReason'}]},
    'venue': {'id': '5a17736b446ea613107b50ce',
    'name': 'Suite 114',
    'location': {'address': '116 Dundas St W',
    'lat': 43.655766,
    'lng': -79.38431,
    'labeledLatLngs': [{'label': 'display',
    'lat': 43.655766,
    'lng': -79.38431}],
    'distance': 307,
    'postalCode': 'M5G 1C3',
    'cc': 'CA',
    'city': 'Toronto',
    'state': 'ON',
    'country': 'Canada',
    'formattedAddress': ['116 Dundas St W',
    'Toronto ON M5G 1C3',
    'Canada']],
    'categories': [{'id': '4bf58dd8d48988d1d4941735',
    'name': 'Speakeasy',
    'pluralName': 'Speakeasies',
    'shortName': 'Speakeasy',
    'icon': {'prefix': 'https://ss3.4sqi.net/img/categories_v2/nightlife/secretbar_',
    'suffix': '.png'},
    'primary': True}],
    'photos': {'count': 0, 'groups': []},
    'referralId': 'e-4-5a17736b446ea613107b50ce-2'},
    {'reasons': {'count': 0,
    'items': [{'summary': 'This spot is popular',
    'type': 'general',
    'reasonName': 'globalInteractionReason'}]},
    'venue': {'id': '4c3a8e78be4620a1c6180b13',
    'name': 'Hilton Toronto Executive Lounge',

```

```

'location': {'address': '145 Richmond Street West',
'lat': 43.650363125865155,
'lng': -79.38580184119992,
'labeledLatLngs': [{'label': 'display',
'lat': 43.650363125865155,
'lng': -79.38580184119992}],
'distance': 416,
'postalCode': 'M5G 1Y1',
'cc': 'CA',
'city': 'Toronto',
'state': 'ON',
'country': 'Canada',
'formattedAddress': ['145 Richmond Street West',
'Toronto ON M5G 1Y1',
'Canada']},
'categories': [{'id': '4bf58dd8d48988d143941735',
'name': 'Breakfast Spot',
'pluralName': 'Breakfast Spots',
'shortName': 'Breakfast',
'icon': {'prefix': 'https://ss3.4sqi.net/img/categories_v2/food/breakfast_',
'suffix': '.png'},
'primary': True}],
'photos': {'count': 0, 'groups': []},
'referralId': 'e-4-4c3a8e78be4620alc6180b13-3'},
'reasons': {'count': 0,
'items': [{'summary': 'This spot is popular',
'type': 'general',
'reasonName': 'globalInteractionReason'}]},
'venue': {'id': '549dd93f498eec33464a5fd2',
'name': 'Queen St. Warehouse',
'location': {'address': '232 Queen St W',
'crossStreet': 'John St',
'lat': 43.650116540590425,
'lng': -79.3903160886256,
'labeledLatLngs': [{'label': 'display',
'lat': 43.650116540590425,
'lng': -79.3903160886256}],
'distance': 496,
'postalCode': 'M5V 1Z6',
'cc': 'CA',
'city': 'Toronto',
'state': 'ON',
'country': 'Canada',
'formattedAddress': ['232 Queen St W (John St)',
'Toronto ON M5V 1Z6',
'Canada']},
'categories': [{'id': '4bf58dd8d48988d116941735',
'name': 'Bar',
'pluralName': 'Bars',
'shortName': 'Bar',
'icon': {'prefix': 'https://ss3.4sqi.net/img/categories_v2/nightlife/pub_',
'suffix': '.png'},
'primary': True}],
'photos': {'count': 0, 'groups': []},
'referralId': 'e-4-549dd93f498eec33464a5fd2-4'}]]]]}

```

```
In [25]: toronto_venue = toronto_drinks_result['response'][0]['items']
toronto_drinks_df = json_normalize(toronto_venue)

toronto_drinks_df
```

Out[25]:

	referralId	reasons.count	reasons.items	venue.id	venue.n
0	e-4-4ad7bf71f964a5205b0e21e3-0	0	[[{'summary': 'This spot is popular', 'type': '...'}]]	4ad7bf71f964a5205b0e21e3	Sin Redemp
1	e-4-4ab2b0b9f964a520e56b20e3-1	0	[[{'summary': 'This spot is popular', 'type': '...'}]]	4ab2b0b9f964a520e56b20e3	The Qi and Be Pi Hc
2	e-4-5a17736b446ea613107b50ce-2	0	[[{'summary': 'This spot is popular', 'type': '...'}]]	5a17736b446ea613107b50ce	Suite
3	e-4-4c3a8e78be4620a1c6180b13-3	0	[[{'summary': 'This spot is popular', 'type': '...'}]]	4c3a8e78be4620a1c6180b13	H Tor Execi Lot
4	e-4-549dd93f498eec33464a5fd2-4	0	[[{'summary': 'This spot is popular', 'type': '...'}]]	549dd93f498eec33464a5fd2	Quee Wareh

```
In [26]: list(toronto_drinks_df.columns)
```

```
Out[26]: ['referralId',
'reasons.count',
'reasons.items',
'venue.id',
'venue.name',
'venue.location.address',
'venue.location.crossStreet',
'venue.location.lat',
'venue.location.lng',
'venue.location.labeledLatLngs',
'venue.location.distance',
'venue.location.postalCode',
'venue.location.cc',
'venue.location.city',
'venue.location.state',
'venue.location.country',
'venue.location.formattedAddress',
'venue.categories',
'venue.photos.count',
'venue.photos.groups']
```

```
In [27]: toronto_drinks2_df = toronto_drinks_df[['venue.id', 'venue.name', 'venue.location.lat', 'venue.location.lng', 'venue.location.formattedAddress']]
toronto_drinks2_df
```

Out[27]:

		venue.id	venue.name	venue.location.lat	venue.location.lng	venue.location.formattedAddress
0	4ad7bf71f964a5205b0e21e3		Sin and Redemption	43.654661	-79.391737	[136 McCaul St]
1	4ab2b0b9f964a520e56b20e3		The Queen and Beaver Public House	43.657472	-79.383524	[35 Elm St. (at Bay St)]
2	5a17736b446ea613107b50ce		Suite 114	43.655766	-79.384310	[116 Dundas St W]
3	4c3a8e78be4620a1c6180b13		Hilton Toronto Executive Lounge	43.650363	-79.385802	[145 Richmond St W]
4	549dd93f498eec33464a5fd2		Queen St. Warehouse	43.650117	-79.390316	[232 Queen St W]

```
In [28]: toronto_venues_id_list = toronto_drinks2_df['venue.id'].values.tolist()
toronto_venues_id_list
```

Out[28]:

```
['4ad7bf71f964a5205b0e21e3',
 '4ab2b0b9f964a520e56b20e3',
 '5a17736b446ea613107b50ce',
 '4c3a8e78be4620a1c6180b13',
 '549dd93f498eec33464a5fd2']
```



```
In [29]: toronto_rating = []
toronto_price = []
toronto_likes = []

for toronto_venues1 in toronto_venues_id_list:
    url_t2 = 'https://api.foursquare.com/v2/venues/{}?client_id={}&client_secret={}&v={}'.format(toronto_venues1, CLIENT_ID, CLIENT_SECRET, VERSION)
    result_t2 = requests.get(url_t2).json()
    result_t4 = result_t2['response']['venue']['rating']
    result_t5 = result_t2['response']['venue']['attributes']['groups'][0]['summary']
    result_t6 = result_t2['response']['venue']['likes']['count']
    toronto_rating.append(result_t4)
    toronto_price.append(result_t5)
    toronto_likes.append(result_t6)

toronto_rpl = pd.DataFrame({'Price': toronto_price, 'Rating': toronto_rating, 'Number of likes': toronto_likes})
toronto_rpl
```

Out[29]:

	Price	Rating	Number of likes
0	\$\$	8.0	153
1	\$\$	8.5	233
2	\$\$\$	7.5	6
3	\$\$\$	7.8	29
4	\$\$	7.9	122

```
In [30]: toronto_v1 = pd.concat([toronto_drinks2_df, toronto_rpl], axis=1)
toronto_v1
```

Out[30]:

	venue.id	venue.name	venue.location.lat	venue.location.lng	venue.location.full_address
0	4ad7bf71f964a5205b0e21e3	Sin and Redemption	43.654661	-79.391737	[136 McCaul St, Toronto, ON M5T 1C4, Canada]
1	4ab2b0b9f964a520e56b20e3	The Queen and Beaver Public House	43.657472	-79.383524	[35 Elm St. (at Bay St), Toronto, ON M5T 1C4, Canada]
2	5a17736b446ea613107b50ce	Suite 114	43.655766	-79.384310	[116 Dundas St W, Toronto, ON M5T 1C4, Canada]
3	4c3a8e78be4620a1c6180b13	Hilton Toronto Executive Lounge	43.650363	-79.385802	[145 Richmond St W, Toronto, ON M5T 1C4, Canada]
4	549dd93f498eec33464a5fd2	Queen St. Warehouse	43.650117	-79.390316	[232 Queen St W, Toronto, ON M5T 1C4, Canada]

```
In [31]: toronto_v2 = toronto_v1.rename(columns={"venue.id": "ID", "venue.name": "Venue", "venue.location.lat": "Latitude", "venue.location.lng": "Longitude", "venue.location.formattedAddress": "Address"})

In [32]: toronto_v3 = toronto_v2.replace({'$$': '$10-$20', '$$$': '$20-$30'})
```

Data </H3>

NEW YORK CITY

```
In [35]: nyc_v3
```

Out[35]:

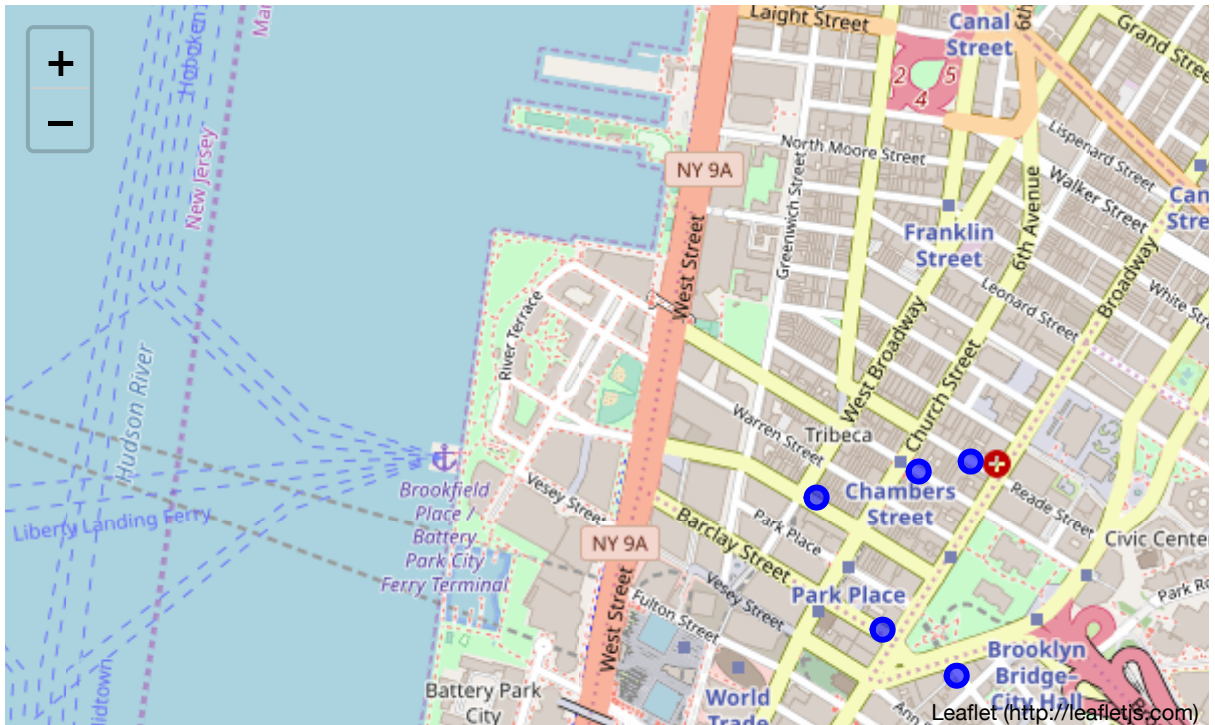
		ID	Venue	Latitude	Longitude	Address	
0	57f0689d498e7d49d9189369		The Bar Room at Temple Court	40.711448	-74.006802	[123 Nassau St, New York, NY 10038, United Sta...	
1	534c9d7b498e1bdd443a40e1		Racines	40.714754	-74.007581	[94 Chambers St, New York, NY 10007, United St...	
2	4db5fbfe43a1369cb5dc2a1f		Maxwell's Bar & Restaurant	40.714944	-74.006485	[59 Reade St (at Broadway), New York, NY 10007...	https://www.seamle
3	4aa0669cf964a5207e3f20e3		The Wooly	40.712212	-74.008357	[11 Barclay St (at Broadway), New York, NY 102...	https://www.grut
4	433b2e80f964a52036281fe3		FlashDancers Downtown	40.714350	-74.009800	[59 Murray St (Church St & West Broadway), New...	

```
In [39]: nyc_map = folium.Map(location=[latitude, longitude], zoom_start=15)

for lat, lng in zip(nyc_v3.Latitude, nyc_v3.Longitude):
    folium.features.CircleMarker(
        [lat, lng],
        radius=5,
        color='blue',
        fill = True,
        fill_color='blue',
        fill_opacity=0.6
    ).add_to(nyc_map)

nyc_map
```

Out[39]:



TORONTO

In [36]:

toronto_v3

Out[36]:

	ID	Venue	Latitude	Longitude	Address	Price	Rating	Nun of I
0	4ad7bf71f964a5205b0e21e3	Sin and Redemption	43.654661	-79.391737	[136 McCaul St. (at Dundas St.), Toronto ON M5...	10–20	8.0	
1	4ab2b0b9f964a520e56b20e3	The Queen and Beaver Public House	43.657472	-79.383524	[35 Elm St. (at Bay St.), Toronto ON M5G 1H1, ...	10–20	8.5	
2	5a17736b446ea613107b50ce	Suite 114	43.655766	-79.384310	[116 Dundas St W, Toronto ON M5G 1C3, Canada]	20–30	7.5	
3	4c3a8e78be4620a1c6180b13	Hilton Toronto Executive Lounge	43.650363	-79.385802	[145 Richmond Street West, Toronto ON M5G 1Y1,...	20–30	7.8	
4	549dd93f498eec33464a5fd2	Queen St. Warehouse	43.650117	-79.390316	[232 Queen St W (John St), Toronto ON M5V 1Z6,...	10–20	7.9	

```

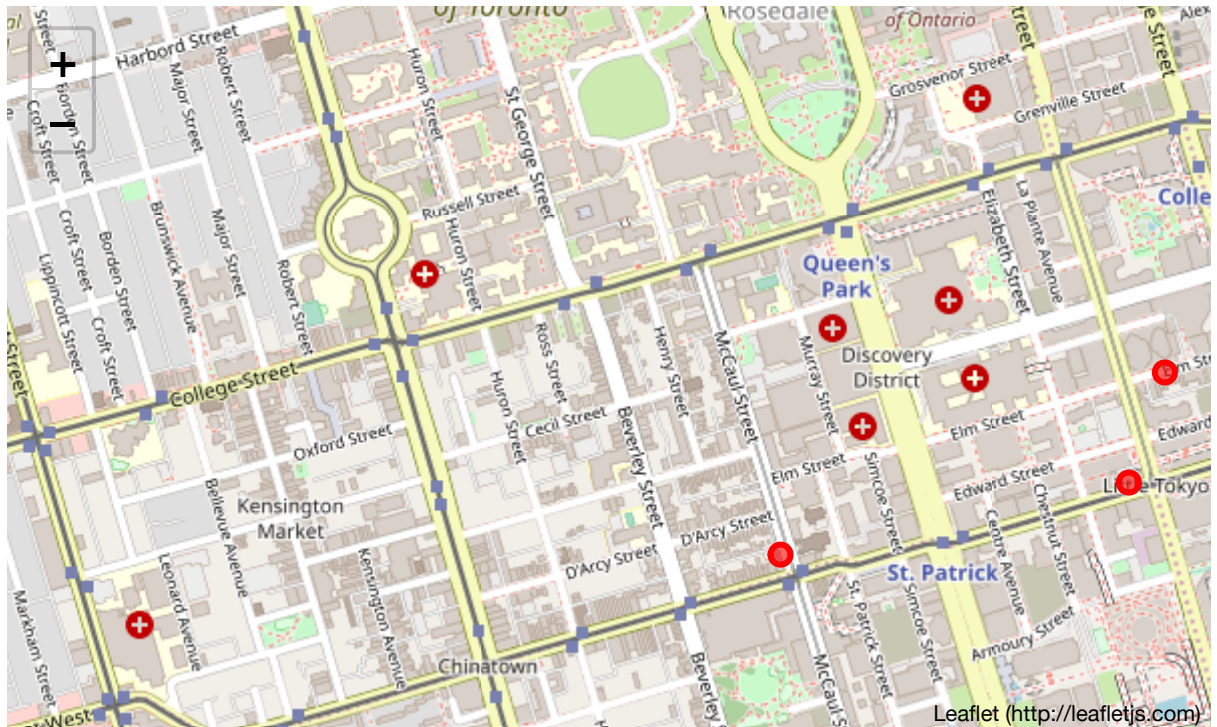
In [41]: toronto_map = folium.Map(location=[43.653963, -79.387207], zoom_start=15)

for lat, lng in zip(toronto_v3.Latitude, toronto_v3.Longitude):
    folium.features.CircleMarker(
        [lat, lng],
        radius=5,
        color='red',
        fill = True,
        fill_color='red',
        fill_opacity=0.6
    ).add_to(toronto_map)

toronto_map

```

Out[41]:



Results and Discussion

Our data shows that NYC has higher ratings and also pricier.

The rating for NYC range from 7.8 to 9.4. Only one of the five venue is tier price 2 (\$10 - \ \$20) and the rest are tier price 3 (\$20 - \ \$30). Although Flash Dancers Downtown has the second highest rating of 8.7, note that there are only 87 likes. Interestingly, two of the venues have delivery, however it is most likely related to food and not drinks.

The rating for Toronto range from 7.5 to 8.0. Three of the venues are tier price 2 and the other two are tier price 3. Interestingly, Suite 114 and Hilton Toronto Executive Lounge only has 6 and 29 likes respectively. The other three venues have more likes, indicating a better data population.

Analysis

Overall, it is difficult to make the comparison between drinking venues in NYC and Toronto just based on price, ratings and likes. The reasons include the following:

- The number of customers is different, therefore the data population may be skewed.
- Some venues seem to offer both drinks and food - which makes it difficult to understand if it is the food that was rated high or the drinks.
- Different venue offer different menu, a deeper look into the menu may offer more valuable insights
- Further scraping on the comments/reviews per venue may offer more insights into customer taste

In addition, I find it interesting how Foursquare have sorted the venues popularity. While the url was set to 'sortByPopularity=0', the data generated did not sort the ratings from high to low. The sort by popularity could also be set to 1, which I tried as an experiment and it yielded lower number of likes therefore I decided to keep it at zero. Understanding how Foursquare sorted the venues would be crucial to have better confidence if the venues generated were indeed the top venues.

Conclusion

While the data was inconclusive, we can agree that NYC is more popular due to more number of likes. More data scraping would be required to further determine the differences for customers to determine which city would be a better fit for them.

In []: