

Choosing the best location for a high-end Asian Restaurant in Downtown Toronto

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I. Description of the business problem and discussion of the background

An acclaimed chef is looking to open an Asian restaurant in Toronto city of Canada. The chef has been in the restaurant industry for his entire life and is widely acclaimed for his culinary expertise and success in the restaurant industry in Asia. The chef is now looking to expand his restaurant business into Toronto. The new business venture will be a high-end culinary establishment that targets middle-income and well-off diners.

In the restaurant industry, if someone says "location can make or break a restaurant", that would not be an exaggeration at all. One of the biggest, if not THE biggest, reasons that restaurants fail is poor location.

After a few meetings with the chef, I have decided that a good location for this acclaimed chef's new restaurant must exhibit the following characteristics:

- User-friendly parking. It would be ideal that the restaurant has its own parking lot.
- Accessibility. The restaurant is located off a major roadway.
- Visibility. The restaurant can be easily seen from the streets.

Those are the basic requirements. Based on the information that the chef will be opening a high-end culinary establishment that targets young and middle-aged diners with income in the higher range, it would be good business acumen that the restaurant is located at where the target market lives, works and/or plays. In addition to user-friendly parking, accessibility and visibility, the location should also exhibit the following attributes:

- Minimum population is preferably about 12,000 within a 5-mile radius.
- Overall trade in the area is growing or stable.
- Retail support is within one mile of site.
- Ideal household income is \$40,000 and above per year.
- Unemployment rate in the area is less than 10%
- Low crime rate.

Other factors to consider are:

- Saturation level in the area. Has the area been saturated by Asian restaurants? Does it have additional appetite for a high-end Asian restaurant?

- Psychographics of the target market. For example, what would make them keep coming back? The psychographics of target market tells the "why".

Location. Location. Location. Good locations forebode success. In this project, I will leverage the Foursquare location data as well as other data sources to scout the best location for this acclaimed chef's new high-end Asian restaurant.

II. Discriptions of the data and how it would be used to scout the best location:

A. Data analysis plan with Foursquare location data: description of the data and how it could be used to solve the problem at hand

1. Search Foursquare data location to find out how many restaurants / Asian restaurants are within 1000-meter radius of the center of Toronto.

2. Visualize these restaurants on the map to see where they are located.

The above earches will show the hot spots for restaurants, as well as areas that might have been saturated. We want to open the restaurant in an area that is associated with gourmet food, but we also try to situate it in an area that is already saturated.

- Perform another Foursquare search to find out the trending venues in the candidate area. The new restaurant will target young, middle-aged customers with income in the higher range. Ideally, we want to situate the restaurant where the target market works, lives and / or plays. The trending venues in the candidate area, coupled with other research, will let us know whether the candidate location atracts the restaurant's target market.

B. Data analysis plan with other data sources:

There are other questions related to scouting out the best location for a restaurant that Foursquare location data does not answer, for example, demographic questions such as population density, unemployment rate, crime rate, business growth. These are important factors to consider when scouting the best location for a new restaurant.

To answer these important demographic questions, I will leverage data from other sources such as:

- The most recent census
- Salary information from www.payscale.com
- Internet search on Google about parking in Toronto.

III.1: Methodology: Foursquare Location Data

In [16]:

```
# Import the necessary Libraries for data analysis.

import requests # Library to handle requests
import pandas as pd # Library for data analysis
import numpy as np # Library to handle data in a vectorized manner
import random # Library for random number generation

!conda install -c conda-forge geopy --yes
from geopy.geocoders import Nominatim # module to convert an address into Latitude and Longitude values

# Libraries for displaying images
from IPython.display import Image
from IPython.core.display import HTML

# transforming json file into a pandas dataframe Library
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): ...working... done
Solving environment: ...working... done

All requested packages already installed.

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

All requested packages already installed.

Folium installed
Libraries imported.

III.1: Foursquare queries

In [17]:

```
# Define Foursquare credentials and version.

CLIENT_ID = 'PUE2QNNL3WRDSORF23CTZ1BWXSH3F0MJ2TKL2TVKZGBYY00' # your Foursquare ID
CLIENT_SECRET = 'FFA5V2QDDO0YEWJJEQWZ01B1F5W0BBEAGXUX4ZSKUQGA' # your Foursquare Secret
VERSION = '20200315'
LIMIT = 30
```

First Foursquare query: find Asian restaurants that are within 1km of the center of Toronto city.

In [18]:

```
# Get the Latitude and Longitude coordinates of Toronto city.

address = 'Toronto, Canada'

geolocator = Nominatim(user_agent="ny_explorer")
location = geolocator.geocode(address)
latitude = location.latitude
longitude = location.longitude
print('The geographical coordinate of Toronto, Canada are {}, {}'.format(latitude, longitude))
```

The geographical coordinate of Toronto, Canada are 43.653963, -79.387207.

In [19]:

```
# First Foursquare query to find the restaurants that are within 1km of [43.653963, -79.387207].

search_query = 'restaurant'
radius = 1000
print(search_query + ' .... OK!')

restaurant .... OK!
```

In [20]:

```
# Define the corresponding URL.
```

```
url = 'https://api.foursquare.com/v2/venues/search?client_id={}&client_secret={}&ll={},{}&v={}&query={}&radius={}&limit={}&offset={}'
```

Out[20]:

```
'https://api.foursquare.com/v2/venues/search?client_id=PUE2QNNL3WRDSORF23CTZ1BWXSH3F0MJ2TKL2TVKZGBYY00&client_secret=...
```

In [21]:

```
# Send the GET request.
```

```
results = requests.get(url).json()
```

In [22]:

```
# Get relevant part of JSON and transform it into pandas dataframe.

# assign relevant part of JSON to venues
venues = results['response']['venues']

# tranform venues into a dataframe
dataframe = json_normalize(venues)

dataframe
```

Out[22]:

		id	name	categories	referralId	hasPerk	location.address	location.lat	location.lng
0	4ad4c05ff964a52048f720e3	Hemispheres Restaurant & Bistro	'4bf58dd8d48988d14e941735', 'name': 'A...	1584471379	v-	False	110 Chestnut Street	43.654884	-79.385931
1	4b223f5af964a520ba4424e3	Azure Restaurant & Bar	'4bf58dd8d48988d1c4941735', 'name': 'R...	1584471379	v-	False	225 Front St W	43.644749	-79.385113
2	4b266f05f964a520657b24e3	Goldstone Noodle Restaurant 金石	'4bf58dd8d48988d1d1941735', 'name': 'N...	1584471379	v-	False	266 Spadina Ave	43.652278	-79.398039
3	4ad4c060f964a5207ff720e3	Rol San Restaurant 龍笙棧	'4bf58dd8d48988d1f5931735', 'name': 'D...	1584471379	v-	False	323 Spadina Ave.	43.654318	-79.398650
4	4b074bb1f964a52077fb22e3	New Sky Restaurant 小沙田食家	'4bf58dd8d48988d145941735', 'name': 'C...	1584471379	v-	False	353 Spadina Ave.	43.655337	-79.398897
5	4ae29812f964a520288f21e3	Swatow Restaurant 汕頭小食家	'4bf58dd8d48988d145941735', 'name': 'C...	1584471379	v-	False	309 Spadina Ave.	43.653866	-79.398334
6	4aef8854f964a5201cd921e3	Aroma Fine Indian Restaurant	'4bf58dd8d48988d10f941735', 'name': 'I...	1584471379	v-	False	287 King St. W	43.646463	-79.389644
7	4d06c1ccc2e53704428cc567	North-East Chinese Restaurant 華北美食	'4bf58dd8d48988d145941735', 'name': 'C...	1584471379	v-	False	476 Dundas St.	43.653185	-79.396677
8	4b072e9df964a52009f922e3	Sky Dragon Chinese Restaurant 龍翔酒樓	'4bf58dd8d48988d1f5931735', 'name': 'D...	1584471379	v-	False	280 Spadina Ave.	43.652783	-79.398174
9	4ad4c05cf964a52006f620e3	Victoria's Restaurant	'4bf58dd8d48988d1c4941735', 'name': 'R...	1584471379	v-	False	37 King Street East	43.649298	-79.376431
10	4ba2d00cf964a5203e1b38e3	Ka Chi Korean Restaurant	'4bf58dd8d48988d113941735', 'name': 'K...	1584471379	v-	False	8 St Andrew St.	43.654307	-79.399277
11	5750b013498e755287c6de97	Some Time BBQ Grill Restaurant 碳烤屋	'52af3b773cf9994f4e043c03', 'name': 'S...	1584471379	v-	False	988 Baldwin Street	43.655874	-79.393826
12	4ad4c05df964a5203ff620e3	Victor Restaurant & Bar	'4bf58dd8d48988d116941735', 'name': 'B...	1584471379	v-	False	30 Mercer Street	43.645634	-79.391125
13	4b2027b5f964a520f82d24e3	Hong Shing Chinese Restaurant	'4bf58dd8d48988d145941735', 'name': 'C...	1584471379	v-	False	195 Dundas St W	43.654925	-79.387089
14	5c33c7cd8194fc002c66f72e	Green Tea Restaurant Downtown	'4bf58dd8d48988d145941735', 'name': 'C...	1584471379	v-	False	261 Spadina Avenue. Upper level	43.652488	-79.397501
15	4c69740b8d22c9284d42b745	Wah Too Seafood Restaurant	'4bf58dd8d48988d145941735', 'name': 'C...	1584471379	v-	False	56 Centre Ave.	43.654833	-79.387206
16	5b1c3098f96b2c002c5eb0c5	Tasty's Caribbean Restaurant & Catering	'4bf58dd8d48988d144941735', 'name': 'C...	1584471379	v-	False	405 Spadina Ave	43.656794	-79.399251
17	4bce1ec0cc8cd13a9ac8c3cf	Kensington Cornerstone Restaurant	'4bf58dd8d48988d143941735', 'name': 'B...	1584471379	v-	False	2A Kensington Ave.	43.652803	-79.399958
18	4bd47e6fca7b7139f2924da	Studio Restaurant	'4bf58dd8d48988d143941735', 'name': 'B...	1584471379	v-	False	389 Church St.	43.661500	-79.379319
19	4ae4b055f964a520229d21e3	Kyoto House Japanese Restaurant	'4bf58dd8d48988d1d2941735', 'name': 'S...	1584471379	v-	False	143 Dundas St. West	43.655381	-79.385270

	id	name	categories	referralId	hasPerk	location.address	location.lat	location.lng
20	52a7ae41498eed3af4d0a3fa	Yueh Tung Chinese Restaurant	{'id': '4bf58dd8d48988d145941735', 'name': 'C...	v-1584471379	False	126 Elizabeth St.	43.655281	-79.385337
21	4b295e10f964a520ba9d24e3	Richtree Natural Market Restaurants	{'id': '4bf58dd8d48988d1c4941735', 'name': 'R...	v-1584471379	False	14 Queen St W	43.652614	-79.380231
22	4c476d6719fde21e32410876	Cali Restaurant	{'id': '4bf58dd8d48988d14a941735', 'name': 'V...	v-1584471379	False	179 Dundas St. W.	43.655068	-79.386375
23	4ddb8e8697d8b771c0b09b885	Dim Sum King Seafood Restaurant	{'id': '4bf58dd8d48988d1f5931735', 'name': 'D...	v-1584471379	False	421 Dundas St W	43.653503	-79.395405
24	4ad7929cf964a520500c21e3	The Senator Restaurant	{'id': '4bf58dd8d48988d147941735', 'name': 'D...	v-1584471379	False	249 Victoria Street	43.655641	-79.379199
25	4b82c671f964a52016e430e3	Anoush Restaurant	{'id': '4bf58dd8d48988d1c4941735', 'name': 'R...	v-1584471379	False	250 Dundas St W	43.654588	-79.389692
26	4b2a674ef964a52074a824e3	New Treasure Restaurant	{'id': '4bf58dd8d48988d1f5931735', 'name': 'D...	v-1584471379	False	150 Dundas St W	43.655384	-79.385362
27	4afa1f33f964a520e91622e3	Fune Japanese Restaurant	{'id': '4bf58dd8d48988d111941735', 'name': 'J...	v-1584471379	False	100 Simcoe St.	43.648514	-79.386457
28	537e313d498e9e9e015f3018	Montecito Restaurant	{'id': '4bf58dd8d48988d1c4941735', 'name': 'R...	v-1584471379	False	299 Adelaide St W	43.647644	-79.391069
29	5a7c3e079de23b294a2c4117	Restaurant Adelaide	{'id': '4bf58dd8d48988d1c4941735', 'name': 'R...	v-1584471379	False	325 Bay St (31st floor)	43.649563	-79.380590

```

In [23]: # Define information of interest and filter dataframe.

# keep only columns that include venue name, and anything that is associated with location
filtered_columns = ['name', 'categories'] + [col for col in dataframe.columns if col.startswith('location.')] + ['i
dataframe_filtered = dataframe.loc[:, filtered_columns]

# function that extracts the category of the venue
def get_category_type(row):
    try:
        categories_list = row['categories']
    except:
        categories_list = row['venue.categories']

    if len(categories_list) == 0:
        return None
    else:
        return categories_list[0]['name']

# filter the category for each row
dataframe_filtered['categories'] = dataframe_filtered.apply(get_category_type, axis=1)

# clean column names by keeping only last term
dataframe_filtered.columns = [column.split('.')[0] for column in dataframe_filtered.columns]

#dataframe_filtered.head()

dataframe_filtered

```

Out[23]:

	name	categories	address	lat	lng	labeledLatLngs	distance	postalCode	cc	city	state	country
0	Hemispheres Restaurant & Bistro	American Restaurant	110 Chestnut Street	43.654884	-79.385931	[{'label': 'display', 'lat': 43.654884, 'lng': -79.385931, 'distance': 145, 'postalCode': 'M5G 1R3', 'cc': 'CA', 'city': 'Toronto', 'state': 'ON', 'country': 'Canada'}]	145	M5G 1R3	CA	Toronto	ON	Canada
1	Azure Restaurant & Bar	Restaurant	225 Front St W	43.644749	-79.385113	[{'label': 'display', 'lat': 43.644749, 'lng': -79.385113, 'distance': 1039, 'postalCode': 'M5V 2X3', 'cc': 'CA', 'city': 'Toronto', 'state': 'ON', 'country': 'Canada'}]	1039	M5V 2X3	CA	Toronto	ON	Canada
2	Goldstone Noodle Restaurant 金石	Noodle House	266 Spadina Ave	43.652278	-79.398039	[{'label': 'display', 'lat': 43.652278, 'lng': -79.398039, 'distance': 892, 'postalCode': 'M5T 2E4', 'cc': 'CA', 'city': 'Toronto', 'state': 'ON', 'country': 'Canada'}]	892	M5T 2E4	CA	Toronto	ON	Canada
3	Rol San Restaurant 龍笙棧	Dim Sum Restaurant	323 Spadina Ave.	43.654318	-79.398650	[{'label': 'display', 'lat': 43.654318, 'lng': -79.398650, 'distance': 922, 'postalCode': 'M5T 2E9', 'cc': 'CA', 'city': 'Toronto', 'state': 'ON', 'country': 'Canada'}]	922	M5T 2E9	CA	Toronto	ON	Canada
4	New Sky Restaurant 小沙田食家	Chinese Restaurant	353 Spadina Ave.	43.655337	-79.398897	[{'label': 'display', 'lat': 43.655337, 'lng': -79.398897, 'distance': 953, 'postalCode': 'M5T 2G3', 'cc': 'CA', 'city': 'Toronto', 'state': 'ON', 'country': 'Canada'}]	953	M5T 2G3	CA	Toronto	ON	Canada
5	Swatow Restaurant 汕頭小食家	Chinese Restaurant	309 Spadina Ave.	43.653866	-79.398334	[{'label': 'display', 'lat': 43.653866, 'lng': -79.398334, 'distance': 896, 'postalCode': 'M5T 2E6', 'cc': 'CA', 'city': 'Toronto', 'state': 'ON', 'country': 'Canada'}]	896	M5T 2E6	CA	Toronto	ON	Canada
6	Aroma Fine Indian Restaurant	Indian Restaurant	287 King St. W	43.646463	-79.389644	[{'label': 'display', 'lat': 43.646463, 'lng': -79.389644, 'distance': 857, 'postalCode': 'M5V 1J5', 'cc': 'CA', 'city': 'Toronto', 'state': 'ON', 'country': 'Canada'}]	857	M5V 1J5	CA	Toronto	ON	Canada
7	North-East Chinese Restaurant 華北美食	Chinese Restaurant	476 Dundas St.	43.653185	-79.396677	[{'label': 'display', 'lat': 43.653185, 'lng': -79.396677, 'distance': 767, 'postalCode': 'M5T 1G6', 'cc': 'CA', 'city': 'Toronto', 'state': 'ON', 'country': 'Canada'}]	767	NaN	CA	Toronto	ON	Canada
8	Sky Dragon Chinese Restaurant 龍翔酒樓	Dim Sum Restaurant	280 Spadina Ave.	43.652783	-79.398174	[{'label': 'display', 'lat': 43.652783, 'lng': -79.398174, 'distance': 892, 'postalCode': 'M5T 2E4', 'cc': 'CA', 'city': 'Toronto', 'state': 'ON', 'country': 'Canada'}]	892	NaN	CA	Toronto	ON	Canada
9	Victoria's Restaurant	Restaurant	37 King Street East	43.649298	-79.376431	[{'label': 'display', 'lat': 43.649298, 'lng': -79.376431, 'distance': 1011, 'postalCode': 'M5C 1E9', 'cc': 'CA', 'city': 'Toronto', 'state': 'ON', 'country': 'Canada'}]	1011	M5C 1E9	CA	Toronto	ON	Canada
10	Ka Chi Korean Restaurant	Korean Restaurant	8 St Andrew St.	43.654307	-79.399277	[{'label': 'display', 'lat': 43.654307, 'lng': -79.399277, 'distance': 972, 'postalCode': 'M5T 1K6', 'cc': 'CA', 'city': 'Toronto', 'state': 'ON', 'country': 'Canada'}]	972	M5T 1K6	CA	Toronto	ON	Canada
11	Some Time BBQ Grill Restaurant 碳烤屋	Szechuan Restaurant	988 Baldwin Street	43.655874	-79.393826	[{'label': 'display', 'lat': 43.655874, 'lng': -79.393826, 'distance': 573, 'postalCode': 'M5T 1G6', 'cc': 'CA', 'city': 'Toronto', 'state': 'ON', 'country': 'Canada'}]	573	NaN	CA	Toronto	ON	Canada
12	Victor Restaurant & Bar	Bar	30 Mercer Street	43.645634	-79.391125	[{'label': 'display', 'lat': 43.645634, 'lng': -79.391125, 'distance': 979, 'postalCode': 'M5V 1H3', 'cc': 'CA', 'city': 'Toronto', 'state': 'ON', 'country': 'Canada'}]	979	M5V 1H3	CA	Toronto	ON	Canada
13	Hong Shing Chinese Restaurant	Chinese Restaurant	195 Dundas St W	43.654925	-79.387089	[{'label': 'display', 'lat': 43.654925, 'lng': -79.387089, 'distance': 107, 'postalCode': 'M5G 1C7', 'cc': 'CA', 'city': 'Toronto', 'state': 'ON', 'country': 'Canada'}]	107	M5G 1C7	CA	Toronto	ON	Canada

	name	categories	address	lat	lng	labeledLatLngs	distance	postalCode	cc	city	state	country
14	Green Tea Restaurant Downtown	Chinese Restaurant	261 Spadina Avenue. Upper level	43.652488	-79.397501	[{"label": "display", "lat": 43.65248783033554...	845	M5T 2E3	CA	Toronto	ON	Canada
15	Wah Too Seafood Restaurant	Chinese Restaurant	56 Centre Ave.	43.654833	-79.387206	[{"label": "display", "lat": 43.65483285234745...	96	M5G 1R5	CA	Toronto	ON	Canada
16	Tasty's Caribbean Restaurant & Catering	Caribbean Restaurant	405 Spadina Ave	43.656794	-79.399251	[{"label": "display", "lat": 43.656794, "lng":...	1019	M5T 2G6	CA	Toronto	ON	Canada
17	Kensington Cornerstone Restaurant	Breakfast Spot	2A Kensington Ave.	43.652803	-79.399958	[{"label": "display", "lat": 43.65280330843737...	1035	M5T 2J7	CA	Toronto	ON	Canada
18	Studio Restaurant	Breakfast Spot	389 Church St.	43.661500	-79.379319	[{"label": "display", "lat": 43.66150015906530...	1052	M5B	CA	Toronto	ON	Canada
19	Kyoto House Japanese Restaurant	Sushi Restaurant	143 Dundas St. West	43.655381	-79.385270	[{"label": "display", "lat": 43.65538110598594...	221	NaN	CA	Toronto	ON	Canada
20	Yueh Tung Chinese Restaurant	Chinese Restaurant	126 Elizabeth St.	43.655281	-79.385337	[{"label": "display", "lat": 43.65528126342919...	210	NaN	CA	Toronto	ON	Canada
21	Richtree Natural Market Restaurants	Restaurant	14 Queen St W	43.652614	-79.380231	[{"label": "display", "lat": 43.65261436174172...	581	M5H 3X4	CA	Toronto	ON	Canada
22	Cali Restaurant	Vietnamese Restaurant	179 Dundas St. W.	43.655068	-79.386375	[{"label": "display", "lat": 43.65506808, "lng":...	140	M5G	CA	Toronto	ON	Canada
23	Dim Sum King Seafood Restaurant	Dim Sum Restaurant	421 Dundas St W	43.653503	-79.395405	[{"label": "display", "lat": 43.653503, "lng":...	662	M5T 2W4	CA	Toronto	ON	Canada
24	The Senator Restaurant	Diner	249 Victoria Street	43.655641	-79.379199	[{"label": "display", "lat": 43.65564091455335...	671	M5B 1T8	CA	Toronto	ON	Canada
25	Anoush Restaurant	Restaurant	250 Dundas St W	43.654588	-79.389692	[{"label": "display", "lat": 43.654588, "lng":...	211	M5T 2Z5	CA	Toronto	ON	Canada
26	New Treasure Restaurant	Dim Sum Restaurant	150 Dundas St W	43.655384	-79.385362	[{"label": "display", "lat": 43.65538444237565...	217	NaN	CA	Toronto	ON	Canada
27	Fune Japanese Restaurant	Japanese Restaurant	100 Simcoe St.	43.648514	-79.386457	[{"label": "display", "lat": 43.64851365544565...	609	NaN	CA	Toronto	ON	Canada
28	Montecito Restaurant	Restaurant	299 Adelaide St W	43.647644	-79.391069	[{"label": "display", "lat": 43.64764401408166...	769	M5V 1P7	CA	Toronto	ON	Canada
29	Restaurant Adelaide	Restaurant	325 Bay St (31st floor)	43.649563	-79.380590	[{"label": "display", "lat": 43.649563, "lng":...	723	M5H	CA	Toronto	ON	Canada

In [24]:

```
# Get the names of Asian restaurants that are within 2km of center of Toronto.
```

```
list1=dataframe_filtered[["name","lat","lng","address","distance"]]
list1
```

Out[24]:

	name	lat	lng	address	distance
0	Hemispheres Restaurant & Bistro	43.654884	-79.385931	110 Chestnut Street	145
1	Azure Restaurant & Bar	43.644749	-79.385113	225 Front St W	1039
2	Goldstone Noodle Restaurant 金石	43.652278	-79.398039	266 Spadina Ave	892
3	Rol San Restaurant 龍笙棧	43.654318	-79.398650	323 Spadina Ave.	922
4	New Sky Restaurant 小沙田食家	43.655337	-79.398897	353 Spadina Ave.	953
5	Swatow Restaurant 汕頭小食家	43.653866	-79.398334	309 Spadina Ave.	896
6	Aroma Fine Indian Restaurant	43.646463	-79.389644	287 King St. W	857
7	North-East Chinese Restaurant 華北美食	43.653185	-79.396677	476 Dundas St.	767
8	Sky Dragon Chinese Restaurant 龍翔酒樓	43.652783	-79.398174	280 Spadina Ave.	892
9	Victoria's Restaurant	43.649298	-79.376431	37 King Street East	1011
10	Ka Chi Korean Restaurant	43.654307	-79.399277	8 St Andrew St.	972
11	Some Time BBQ Grill Restaurant 碳烤屋	43.655874	-79.393826	988 Baldwin Street	573
12	Victor Restaurant & Bar	43.645634	-79.391125	30 Mercer Street	979
13	Hong Shing Chinese Restaurant	43.654925	-79.387089	195 Dundas St W	107
14	Green Tea Restaurant Downtown	43.652488	-79.397501	261 Spadina Avenue. Upper level	845
15	Wah Too Seafood Restaurant	43.654833	-79.387206	56 Centre Ave.	96
16	Tasty's Caribbean Restaurant & Catering	43.656794	-79.399251	405 Spadina Ave	1019
17	Kensington Cornerstone Restaurant	43.652803	-79.399958	2A Kensington Ave.	1035
18	Studio Restaurant	43.661500	-79.379319	389 Church St.	1052
19	Kyoto House Japanese Restaurant	43.655381	-79.385270	143 Dundas St. West	221
20	Yueh Tung Chinese Restaurant	43.655281	-79.385337	126 Elizabeth St.	210
21	Richtree Natural Market Restaurants	43.652614	-79.380231	14 Queen St W	581
22	Cali Restaurant	43.655068	-79.386375	179 Dundas St. W.	140
23	Dim Sum King Seafood Restaurant	43.653503	-79.395405	421 Dundas St W	662
24	The Senator Restaurant	43.655641	-79.379199	249 Victoria Street	671
25	Anoush Restaurant	43.654588	-79.389692	250 Dundas St W	211
26	New Treasure Restaurant	43.655384	-79.385362	150 Dundas St W	217
27	Fune Japanese Restaurant	43.648514	-79.386457	100 Simcoe St.	609
28	Montecito Restaurant	43.647644	-79.391069	299 Adelaide St W	769
29	Restaurant Adelaide	43.649563	-79.380590	325 Bay St (31st floor)	723

The query above only shows culinary establishments that have the word "restaurant" in their names. There are other culinary establishments that do not have the word "restaurant" in their names are not returned. So, we will perform another query with "asian" as the keyword.

In [25]:

```
# First Foursquare query to find the restaurants that are within 1km of [43.653963, -79.387207].

search_query = 'asian'
radius = 1000

url = 'https://api.foursquare.com/v2/venues/search?client_id={}&client_secret={}&ll={},{&v={}&query={}&radius={}&limit={}&offset={}'

results = requests.get(url).json()

# assign relevant part of JSON to venues
venues = results['response']['venues']

# tranform venues into a dataframe
dataframe = json_normalize(venues)

# Define information of interest and filter dataframe.

# keep only columns that include venue name, and anything that is associated with location
filtered_columns = ['name', 'categories'] + [col for col in dataframe.columns if col.startswith('location.')] + ['id']
dataframe_filtered2 = dataframe.loc[:, filtered_columns]

# function that extracts the category of the venue
def get_category_type(row):
    try:
        categories_list = row['categories']
    except:
        categories_list = row['venue.categories']

    if len(categories_list) == 0:
        return None
    else:
        return categories_list[0]['name']

# filter the category for each row
dataframe_filtered2['categories'] = dataframe_filtered2.apply(get_category_type, axis=1)

# clean column names by keeping only last term
dataframe_filtered2.columns = [column.split('.')[0] for column in dataframe_filtered2.columns]

#dataframe_filtered2.head()

dataframe_filtered2
```

Out[25]:

	name	categories	address	crossStreet	lat	lng	labeledLatLngs	distance	postalCode	cc	city	state
0	Asian Legend 味香村	Chinese Restaurant	418 Dundas St W	btwn Beverley & Huron St	43.653603	-79.395047	[{"label": "display", "lat": 43.65360271388312...	632	M5T 1G7	CA	Toronto	ON
1	Fine Asian Bowl	Vietnamese Restaurant	271 Yonge St	btwn Dundas St. E & Shuter St	43.655387	-79.380326	[{"label": "display", "lat": 43.6553866, "lng":...	576	M5B 1N8	CA	Toronto	ON
2	Fusia Asian Kitchen	Food Court	NaN	Bay and Dundas	43.656170	-79.383549	[{"label": "display", "lat": 43.65617042572259...	383	NaN	CA	Toronto	ON
3	SenseAsian Pan-Asian Resto	Asian Restaurant	40 King St W	NaN	43.649610	-79.378912	[{"label": "display", "lat": 43.64961044882256...	825	NaN	CA	Toronto	ON
4	Lee Chen Asian Bistro	Asian Restaurant	214 King St W	Simcoe St	43.647010	-79.386536	[{"label": "display", "lat": 43.64700977986747...	775	M5H 3S6	CA	Toronto	ON
5	East Restaurant Asian Street Flair	Asian Restaurant	240 Queen Street West	Queen and John	43.649985	-79.390563	[{"label": "display", "lat": 43.64998452583986...	518	M5v1z7	CA	Toronto	ON
6	Lotus Leaf Asian Cuisine	Asian Restaurant	200 Elizabeth	Elizabeth Ave & University	43.659216	-79.389354	[{"label": "display", "lat": 43.65921571056295...	609	M5G	CA	Toronto	ON
7	Asian Community AIDS Services (ACAS)	Office	260 Spadina Ave, Suite 410	at Cameron Ave.	43.651991	-79.397893	[{"label": "display", "lat": 43.65199101292225...	888	M5T 2E4	CA	Toronto	ON
8	Asian Gourmet	Chinese Restaurant	NaN	NaN	43.649288	-79.378183	[{"label": "display", "lat": 43.649288, "lng":...	893	NaN	CA	NaN	NaN

	name	categories	address	crossStreet	lat	lng	labeledLatLngs	distance	postalCode	cc	city	state
9	Yulla Asian Fusion Restaurant	Asian Restaurant	NaN	NaN	43.651587	-79.379232	[{"label": "display", "lat": 43.651587, "lng": ...}	694	NaN	CA	Toronto	ON
10	Chic Chinoise Pan Asian Cuisine	Asian Restaurant	214 King St. W	Simcoe	43.647074	-79.386176	[{"label": "display", "lat": 43.647074, "lng": ...}	771	NaN	CA	Toronto	ON

The second query did return some culinary establishments that were not returned by the first query.

In [26]:

```
# Get the names of the asian food culinary establishments returned by the second query
list2=dataframe_filtered2[["name","lat","lng", "address","distance"]]
list2
```

Out[26]:

	name	lat	lng	address	distance
0	Asian Legend 味香村	43.653603	-79.395047	418 Dundas St W	632
1	Fine Asian Bowl	43.655387	-79.380326	271 Yonge St.	576
2	Fusia Asian Kitchen	43.656170	-79.383549	NaN	383
3	SenseAsian Pan-Asian Resto	43.649610	-79.378912	40 King St W	825
4	Lee Chen Asian Bistro	43.647010	-79.386536	214 King St W	775
5	East Restaurant Asian Street Flair	43.649985	-79.390563	240 Queen Street West	518
6	Lotus Leaf Asian Cuisine	43.659216	-79.389354	200 Elizabeth	609
7	Asian Community AIDS Services (ACAS)	43.651991	-79.397893	260 Spadina Ave, Suite 410	888
8	Asian Gourmet	43.649288	-79.378183	NaN	893
9	Yulla Asian Fusion Restaurant	43.651587	-79.379232	NaN	694
10	Chic Chinoise Pan Asian Cuisine	43.647074	-79.386176	214 King St. W	771

We are going to concatenate "name1" and "name2" together to find out how many asian restaurants are within 1000 meters of radius.

In [27]:

```
# concatenate 'name' and 'name2'
frames=[list1, list2]
combined_list=pd.concat(frames)

# Drop the duplicates in case there is any. The first search returned only establishments with the word "restaurant:
# The second returned establishments with the word "asian". There could be establishments with the phrase "asian re:
# that showed up in the results of both queries.

combined_list.drop_duplicates(keep='first')
```

Out[27]:

	name	lat	lng	address	distance
0	Hemispheres Restaurant & Bistro	43.654884	-79.385931	110 Chestnut Street	145
1	Azure Restaurant & Bar	43.644749	-79.385113	225 Front St W	1039
2	Goldstone Noodle Restaurant 金石	43.652278	-79.398039	266 Spadina Ave	892
3	Rol San Restaurant 龍笙棧	43.654318	-79.398650	323 Spadina Ave.	922
4	New Sky Restaurant 小沙田食家	43.655337	-79.398897	353 Spadina Ave.	953
5	Swatow Restaurant 汕頭小食家	43.653866	-79.398334	309 Spadina Ave.	896
6	Aroma Fine Indian Restaurant	43.646463	-79.389644	287 King St. W	857
7	North-East Chinese Restaurant 華北美食	43.653185	-79.396677	476 Dundas St.	767
8	Sky Dragon Chinese Restaurant 龍翔酒樓	43.652783	-79.398174	280 Spadina Ave.	892
9	Victoria's Restaurant	43.649298	-79.376431	37 King Street East	1011
10	Ka Chi Korean Restaurant	43.654307	-79.399277	8 St Andrew St.	972
11	Some Time BBQ Grill Restaurant 碳烤屋	43.655874	-79.393826	988 Baldwin Street	573
12	Victor Restaurant & Bar	43.645634	-79.391125	30 Mercer Street	979
13	Hong Shing Chinese Restaurant	43.654925	-79.387089	195 Dundas St W	107
14	Green Tea Restaurant Downtown	43.652488	-79.397501	261 Spadina Avenue. Upper level	845
15	Wah Too Seafood Restaurant	43.654833	-79.387206	56 Centre Ave.	96
16	Tasty's Caribbean Restaurant & Catering	43.656794	-79.399251	405 Spadina Ave	1019
17	Kensington Cornerstone Restaurant	43.652803	-79.399958	2A Kensington Ave.	1035
18	Studio Restaurant	43.661500	-79.379319	389 Church St.	1052
19	Kyoto House Japanese Restaurant	43.655381	-79.385270	143 Dundas St. West	221
20	Yueh Tung Chinese Restaurant	43.655281	-79.385337	126 Elizabeth St.	210
21	Richtree Natural Market Restaurants	43.652614	-79.380231	14 Queen St W	581
22	Cali Restaurant	43.655068	-79.386375	179 Dundas St. W.	140
23	Dim Sum King Seafood Restaurant	43.653503	-79.395405	421 Dundas St W	662
24	The Senator Restaurant	43.655641	-79.379199	249 Victoria Street	671
25	Anoush Restaurant	43.654588	-79.389692	250 Dundas St W	211
26	New Treasure Restaurant	43.655384	-79.385362	150 Dundas St W	217
27	Fune Japanese Restaurant	43.648514	-79.386457	100 Simcoe St.	609
28	Montecito Restaurant	43.647644	-79.391069	299 Adelaide St W	769
29	Restaurant Adelaide	43.649563	-79.380590	325 Bay St (31st floor)	723
0	Asian Legend 味香村	43.653603	-79.395047	418 Dundas St W	632
1	Fine Asian Bowl	43.655387	-79.380326	271 Yonge St.	576
2	Fusia Asian Kitchen	43.656170	-79.383549	NaN	383
3	SenseAsian Pan-Asian Resto	43.649610	-79.378912	40 King St W	825
4	Lee Chen Asian Bistro	43.647010	-79.386536	214 King St W	775
5	East Restaurant Asian Street Flair	43.649985	-79.390563	240 Queen Street West	518
6	Lotus Leaf Asian Cuisine	43.659216	-79.389354	200 Elizabeth	609
7	Asian Community AIDS Services (ACAS)	43.651991	-79.397893	260 Spadina Ave, Suite 410	888
8	Asian Gourmet	43.649288	-79.378183	NaN	893
9	Yulla Asian Fusion Restaurant	43.651587	-79.379232	NaN	694
10	Chic Chinoise Pan Asian Cuisine	43.647074	-79.386176	214 King St. W	771

The duplicates are dropped. Reset the index.

In [28]:

```
combined_list=pd.DataFrame(combined_list.reset_index(drop=True))
combined_list
```

Out[28]:

	name	lat	lng	address	distance
0	Hemispheres Restaurant & Bistro	43.654884	-79.385931	110 Chestnut Street	145
1	Azure Restaurant & Bar	43.644749	-79.385113	225 Front St W	1039
2	Goldstone Noodle Restaurant 金石	43.652278	-79.398039	266 Spadina Ave	892
3	Rol San Restaurant 龍笙棧	43.654318	-79.398650	323 Spadina Ave.	922
4	New Sky Restaurant 小沙田食家	43.655337	-79.398897	353 Spadina Ave.	953
5	Swatow Restaurant 汕頭小食家	43.653866	-79.398334	309 Spadina Ave.	896
6	Aroma Fine Indian Restaurant	43.646463	-79.389644	287 King St. W	857
7	North-East Chinese Restaurant 華北美食	43.653185	-79.396677	476 Dundas St.	767
8	Sky Dragon Chinese Restaurant 龍翔酒樓	43.652783	-79.398174	280 Spadina Ave.	892
9	Victoria's Restaurant	43.649298	-79.376431	37 King Street East	1011
10	Ka Chi Korean Restaurant	43.654307	-79.399277	8 St Andrew St.	972
11	Some Time BBQ Grill Restaurant 碳烤屋	43.655874	-79.393826	988 Baldwin Street	573
12	Victor Restaurant & Bar	43.645634	-79.391125	30 Mercer Street	979
13	Hong Shing Chinese Restaurant	43.654925	-79.387089	195 Dundas St W	107
14	Green Tea Restaurant Downtown	43.652488	-79.397501	261 Spadina Avenue. Upper level	845
15	Wah Too Seafood Restaurant	43.654833	-79.387206	56 Centre Ave.	96
16	Tasty's Caribbean Restaurant & Catering	43.656794	-79.399251	405 Spadina Ave	1019
17	Kensington Cornerstone Restaurant	43.652803	-79.399958	2A Kensington Ave.	1035
18	Studio Restaurant	43.661500	-79.379319	389 Church St.	1052
19	Kyoto House Japanese Restaurant	43.655381	-79.385270	143 Dundas St. West	221
20	Yueh Tung Chinese Restaurant	43.655281	-79.385337	126 Elizabeth St.	210
21	Richtree Natural Market Restaurants	43.652614	-79.380231	14 Queen St W	581
22	Cali Restaurant	43.655068	-79.386375	179 Dundas St. W.	140
23	Dim Sum King Seafood Restaurant	43.653503	-79.395405	421 Dundas St W	662
24	The Senator Restaurant	43.655641	-79.379199	249 Victoria Street	671
25	Anoush Restaurant	43.654588	-79.389692	250 Dundas St W	211
26	New Treasure Restaurant	43.655384	-79.385362	150 Dundas St W	217
27	Fune Japanese Restaurant	43.648514	-79.386457	100 Simcoe St.	609
28	Montecito Restaurant	43.647644	-79.391069	299 Adelaide St W	769
29	Restaurant Adelaide	43.649563	-79.380590	325 Bay St (31st floor)	723
30	Asian Legend 味香村	43.653603	-79.395047	418 Dundas St W	632
31	Fine Asian Bowl	43.655387	-79.380326	271 Yonge St.	576
32	Fusia Asian Kitchen	43.656170	-79.383549	NaN	383
33	SenseAsian Pan-Asian Resto	43.649610	-79.378912	40 King St W	825
34	Lee Chen Asian Bistro	43.647010	-79.386536	214 King St W	775
35	East Restaurant Asian Street Flair	43.649985	-79.390563	240 Queen Street West	518
36	Lotus Leaf Asian Cuisine	43.659216	-79.389354	200 Elizabeth	609
37	Asian Community AIDS Services (ACAS)	43.651991	-79.397893	260 Spadina Ave, Suite 410	888
38	Asian Gourmet	43.649288	-79.378183	NaN	893
39	Yulla Asian Fusion Restaurant	43.651587	-79.379232	NaN	694
40	Chic Chinoise Pan Asian Cuisine	43.647074	-79.386176	214 King St. W	771

There are 41 entries in total, with one that is clearly not a culinary establishment, Asian Community AIDS Services (ACAS). We are going drop that establishment.

In [29]:

```
combined_list.drop(combined_list.index[37], inplace=True)
combined_list.reset_index(drop=True)
```

Out[29]:

	name	lat	lng	address	distance
0	Hemispheres Restaurant & Bistro	43.654884	-79.385931	110 Chestnut Street	145
1	Azure Restaurant & Bar	43.644749	-79.385113	225 Front St W	1039
2	Goldstone Noodle Restaurant 金石	43.652278	-79.398039	266 Spadina Ave	892
3	Rol San Restaurant 龍笙棧	43.654318	-79.398650	323 Spadina Ave.	922
4	New Sky Restaurant 小沙田食家	43.655337	-79.398897	353 Spadina Ave.	953
5	Swatow Restaurant 汕頭小食家	43.653866	-79.398334	309 Spadina Ave.	896
6	Aroma Fine Indian Restaurant	43.646463	-79.389644	287 King St. W	857
7	North-East Chinese Restaurant 華北美食	43.653185	-79.396677	476 Dundas St.	767
8	Sky Dragon Chinese Restaurant 龍翔酒樓	43.652783	-79.398174	280 Spadina Ave.	892
9	Victoria's Restaurant	43.649298	-79.376431	37 King Street East	1011
10	Ka Chi Korean Restaurant	43.654307	-79.399277	8 St Andrew St.	972
11	Some Time BBQ Grill Restaurant 碳烤屋	43.655874	-79.393826	988 Baldwin Street	573
12	Victor Restaurant & Bar	43.645634	-79.391125	30 Mercer Street	979
13	Hong Shing Chinese Restaurant	43.654925	-79.387089	195 Dundas St W	107
14	Green Tea Restaurant Downtown	43.652488	-79.397501	261 Spadina Avenue. Upper level	845
15	Wah Too Seafood Restaurant	43.654833	-79.387206	56 Centre Ave.	96
16	Tasty's Caribbean Restaurant & Catering	43.656794	-79.399251	405 Spadina Ave	1019
17	Kensington Cornerstone Restaurant	43.652803	-79.399958	2A Kensington Ave.	1035
18	Studio Restaurant	43.661500	-79.379319	389 Church St.	1052
19	Kyoto House Japanese Restaurant	43.655381	-79.385270	143 Dundas St. West	221
20	Yueh Tung Chinese Restaurant	43.655281	-79.385337	126 Elizabeth St.	210
21	Richtree Natural Market Restaurants	43.652614	-79.380231	14 Queen St W	581
22	Cali Restaurant	43.655068	-79.386375	179 Dundas St. W.	140
23	Dim Sum King Seafood Restaurant	43.653503	-79.395405	421 Dundas St W	662
24	The Senator Restaurant	43.655641	-79.379199	249 Victoria Street	671
25	Anoush Restaurant	43.654588	-79.389692	250 Dundas St W	211
26	New Treasure Restaurant	43.655384	-79.385362	150 Dundas St W	217
27	Fune Japanese Restaurant	43.648514	-79.386457	100 Simcoe St.	609
28	Montecito Restaurant	43.647644	-79.391069	299 Adelaide St W	769
29	Restaurant Adelaide	43.649563	-79.380590	325 Bay St (31st floor)	723
30	Asian Legend 味香村	43.653603	-79.395047	418 Dundas St W	632
31	Fine Asian Bowl	43.655387	-79.380326	271 Yonge St.	576
32	Fusia Asian Kitchen	43.656170	-79.383549	NaN	383
33	SenseAsian Pan-Asian Resto	43.649610	-79.378912	40 King St W	825
34	Lee Chen Asian Bistro	43.647010	-79.386536	214 King St W	775
35	East Restaurant Asian Street Flair	43.649985	-79.390563	240 Queen Street West	518
36	Lotus Leaf Asian Cuisine	43.659216	-79.389354	200 Elizabeth	609
37	Asian Gourmet	43.649288	-79.378183	NaN	893
38	Yulla Asian Fusion Restaurant	43.651587	-79.379232	NaN	694
39	Chic Chinoise Pan Asian Cuisine	43.647074	-79.386176	214 King St. W	771

The queries together returned 40 restaurants with in 1000 meters of the center of the city.

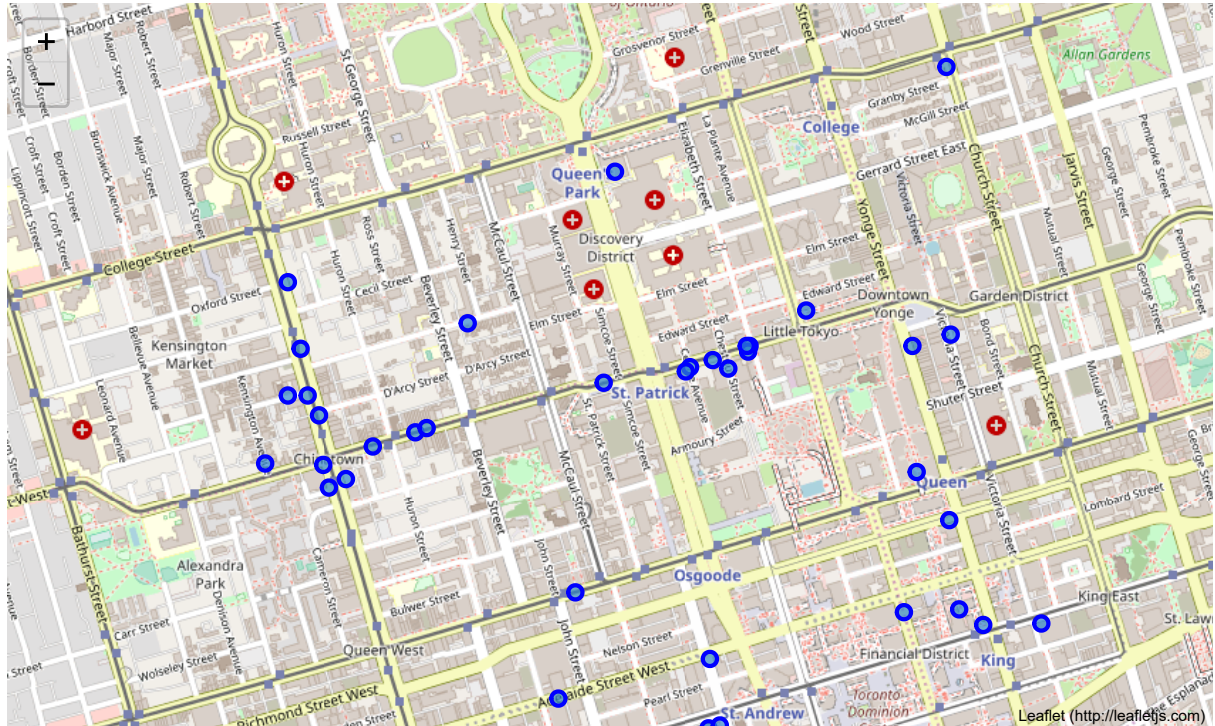
In [31]:

```
latitude=43.653963
longitude=-79.387207
# create map of Manhattan using Latitude and Longitude values
restaurants = folium.Map(location=[latitude, longitude], zoom_start=15)

# add markers to map
for lat, lng, label in zip(combined_list['lat'], combined_list['lng'], combined_list['name']):
    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(restaurants)

restaurants
```

Out[31]:



The blue dots are the restaurants. To see the name of the restaurant, hover the cursor over the dot and click on it.

From the map, we see that the restaurants are spread in Fashion District, Financial District, Garden District, Kensington Market, Discovery District, Queen's Park, Chinatown, Little Tokyo. With most of them near Chinatown, Little Tokyo. This tells us that Downtown Toronto is a culinary hot spot. A good location candidate for a new restaurant.

We want to open the new restaurant in an area that that people associate with gourmet food and vibrant social life, an area the restaurant's target market works, live and/or plays. At the same time, we also do not want to open the restaurant in an area that is already saturated with restaurants or people have little appetite for another high-end asian restaurant. Looking at the maps, it seems that the Financial District and Entertainment District in downtown Toronto are good location choices.

We are not going to find out what venues are trending in Financial District.

In [32]:

```
latitude=43.6479
longitude=-79.3818
VERSION="20200316"

Limit =15
url = 'https://api.foursquare.com/v2/venues/explore?client_id={}&client_secret={}&ll={},{}&v={}&radius={}&limit={}'

import requests

results = requests.get(url).json()

items = results['response']['groups'][0]['items']
items[0]

dataframe = json_normalize(items) # flatten JSON

# filter columns
filtered_columns = ['venue.name', 'venue.categories'] + [col for col in dataframe.columns if col.startswith('venue.')]
dataframe_filtered = dataframe.loc[:, filtered_columns]

# filter the category for each row
dataframe_filtered['venue.categories'] = dataframe_filtered.apply(get_category_type, axis=1)

# clean columns
dataframe_filtered.columns = [col.split('.')[0] for col in dataframe_filtered.columns]

dataframe_filtered
```

Out[32]:

	name	categories	address	crossStreet	lat	lng	labeledLatLngs	distance	postalCode	cc	city	s
0	LUSH	Cosmetics Shop	220 Yonge St, Unit B215-A	in Toronto Eaton Centre	43.653557	-79.380400	[{"label": "display", "lat": 43.653557, "lng": ...}	121	M5B 2H1	CA	Toronto	
1	UNIQLO ユニクロ	Clothing Store	220 Yonge St	at Dundas St W	43.655910	-79.380641	[{"label": "display", "lat": 43.65591027779457...}	236	M5B 2H1	CA	Toronto	
2	Ed Mirvish Theatre	Theater	244 Victoria St.	btwn Dundas St E and Shuter St	43.655102	-79.379768	[{"label": "display", "lat": 43.65510156732105...}	207	M5B 1V8	CA	Toronto	
3	Indigo	Bookstore	220 Yonge St	NaN	43.653515	-79.380696	[{"label": "display", "lat": 43.65351471121164...}	101	M5B 2H1	CA	Toronto	
4	Nathan Phillips Square	Plaza	100 Queen St W	at Bay St	43.652270	-79.383516	[{"label": "display", "lat": 43.65227047322295...}	233	M5H 2N1	CA	Toronto	
5	Downtown Toronto	Neighborhood	NaN	NaN	43.653232	-79.385296	[{"label": "display", "lat": 43.65323167517444...}	293	NaN	CA	Toronto	
6	Elgin And Winter Garden Theatres	Theater	189 Yonge St	btwn Queen St E & Shuter St	43.653394	-79.378507	[{"label": "display", "lat": 43.65339379601958...}	272	M5B 2H1	CA	Toronto	
7	CF Toronto Eaton Centre	Shopping Mall	220 Yonge St	btwn Queen & Dundas	43.654540	-79.380677	NaN	110	M5B 2H1	CA	Toronto	
8	Eggspectation Bell Trinity Square	Breakfast Spot	483 Bay Street	Albert Street	43.653144	-79.381980	[{"label": "display", "lat": 43.65314383888587...}	92	M5G 2C9	CA	Toronto	
9	JOEY Eaton Centre	Restaurant	1 Dundas St W	NaN	43.655404	-79.381929	[{"label": "display", "lat": 43.65540379999999...}	160	M5G 1Z3	CA	Toronto	
10	Yonge-Dundas Square	Plaza	1 Dundas St E	at Yonge St	43.656054	-79.380495	[{"label": "display", "lat": 43.65605389742188...}	255	M5B 2R8	CA	Toronto	
11	Richmond Station	American Restaurant	1 Richmond Street West	Yonge Street	43.651569	-79.379266	[{"label": "display", "lat": 43.65156872562108...}	335	NaN	CA	Toronto	
12	SEPHORA	Cosmetics Shop	220 Yonge Street, Space #3-131	in Toronto Eaton Centre	43.653688	-79.380120	[{"label": "display", "lat": 43.653688, "lng": ...}	138	M5B 2H1	CA	Toronto	

	name	categories	address	crossStreet	lat	lng	labeledLatLngs	distance	postalCode	cc	city	s
13	Samsung Experience Store (Eaton Centre)	Electronics Store	Toronto Eaton Centre	NaN	43.655648	-79.381011	[{"label": "display", "lat": 43.65564777812532...	198	M5B	CA	Toronto	
14	Old City Hall	Monument / Landmark	60 Queen Street West	NaN	43.652009	-79.381744	[{"label": "display", "lat": 43.65200880087612...	217	M5H 1A1	CA	Toronto	
15	HomeSense	Furniture / Home Store	195 Yonge Street	at Queen St E	43.653053	-79.379450	[{"label": "display", "lat": 43.6530533, "lng":...	214	M5B 1M4	CA	Toronto	
16	Blaze Pizza	Pizza Place	10 Dundas Street East, #124	NaN	43.656518	-79.380015	[{"label": "display", "lat": 43.656518, "lng":...	318	M5B 2G9	CA	Toronto	
17	Nordstrom	Clothing Store	260 Yonge Street	NaN	43.655041	-79.380966	[{"label": "display", "lat": 43.655041, "lng":...	137	M5B 2L9	CA	Toronto	
18	Danish Pastry House	Bakery	NaN	NaN	43.654574	-79.380740	[{"label": "display", "lat": 43.654574, "lng":...	109	M5G	CA	Toronto	
19	Silver Snail Comics	Comic Shop	329 Yonge St	at Dundas St E	43.657031	-79.381403	[{"label": "display", "lat": 43.65703137958407...	343	M5B 1R7	CA	Toronto	
20	Hudson's Bay	Department Store	176 Yonge St	Queen St W	43.652040	-79.380391	[{"label": "display", "lat": 43.65203981587680...	242	M5C 2L7	CA	Toronto	
21	Japango	Sushi Restaurant	122 Elizabeth St.	at Dundas St. W	43.655268	-79.385165	[{"label": "display", "lat": 43.65526771691681...	307	M5G 1P5	CA	Toronto	
22	Apple Eaton Centre	Electronics Store	220 Yonge St	Queen St W	43.654064	-79.380697	[{"label": "display", "lat": 43.6540644, "lng":...	89	M5B 2H1	CA	Toronto	
23	Crepe Delicious	Fast Food Restaurant	220 Yonge St.	NaN	43.654536	-79.380889	[{"label": "display", "lat": 43.65453648827724...	97	M5B 2H1	CA	Toronto	
24	MUJI	Miscellaneous Shop	595 Bay St E	at Dundas St W	43.656024	-79.383284	[{"label": "display", "lat": 43.656024, "lng":...	258	NaN	CA	Toronto	
25	Magic Tailor	Clothing Store	2G-211 Yonge Street	Shuter	43.653742	-79.379745	[{"label": "display", "lat": 43.65374158228865...	167	NaN	CA	Toronto	
26	DAVIDsTEA	Tea Room	10 Dundas St E Unit 108	NaN	43.656973	-79.381040	[{"label": "display", "lat": 43.65697339589283...	340	M5B 2G9	CA	Toronto	
27	Roots	Clothing Store	220 Yonge Street, Unit C 32	NaN	43.653613	-79.380244	[{"label": "display", "lat": 43.65361341708363...	131	M5B 2H1	CA	Toronto	
28	Chatime 日出茶太	Bubble Tea Shop	132 Dundas St W	btwn Bay & University	43.655542	-79.384684	[{"label": "display", "lat": 43.65554164147378...	291	M5G 1C3	CA	Toronto	
29	Trattoria Mercatto	Italian Restaurant	220 Yonge St.	in Toronto Eaton Centre	43.654453	-79.380974	[{"label": "display", "lat": 43.65445314470199...	86	M5B 3H7	CA	Toronto	

In [33]:

```
category1=dataframe_filtered[["categories"]]
category1=category1.rename(columns={"categories": "Financial District Trending Venue Categories"}, errors="raise")
category1
```

Out[33]:

Financial District Trending Venue Categories	
0	Cosmetics Shop
1	Clothing Store
2	Theater
3	Bookstore
4	Plaza
5	Neighborhood
6	Theater
7	Shopping Mall
8	Breakfast Spot
9	Restaurant
10	Plaza
11	American Restaurant
12	Cosmetics Shop
13	Electronics Store
14	Monument / Landmark
15	Furniture / Home Store
16	Pizza Place
17	Clothing Store
18	Bakery
19	Comic Shop
20	Department Store
21	Sushi Restaurant
22	Electronics Store
23	Fast Food Restaurant
24	Miscellaneous Shop
25	Clothing Store
26	Tea Room
27	Clothing Store
28	Bubble Tea Shop
29	Italian Restaurant

Trending venues in the Entertainment District.

In [34]:

```
latitude=43.6427
longitude=-79.3888
VERSION="20200316"

Limit =15
url = 'https://api.foursquare.com/v2/venues/explore?client_id={}&client_secret={}&ll={},{}&v={}&radius={}&limit={}'

import requests

results = requests.get(url).json()

items = results['response']['groups'][0]['items']
items[0]

dataframe = json_normalize(items) # flatten JSON

# filter columns
filtered_columns = ['venue.name', 'venue.categories'] + [col for col in dataframe.columns if col.startswith('venue.')]
dataframe_filtered = dataframe.loc[:, filtered_columns]

# filter the category for each row
dataframe_filtered['venue.categories'] = dataframe_filtered.apply(get_category_type, axis=1)

# clean columns
dataframe_filtered.columns = [col.split('.')[0] for col in dataframe_filtered.columns]

dataframe_filtered
```

Out[34]:

	name	categories	address	crossStreet	lat	lng	labeledLatLngs	distance	postalCode	cc	city	st
0	Karine's	Breakfast Spot	109 McCaul St.	at Dundas St. W	43.653699	-79.390743	[{"label": "display", "lat": 43.65369892831852...	159	M5T 3K5	CA	Toronto	
1	Downtown Toronto	Neighborhood	NaN	NaN	43.653232	-79.385296	[{"label": "display", "lat": 43.65323167517444...	293	NaN	CA	Toronto	
2	The Library Specialty Coffee	Coffee Shop	281 Dundas St West	St Patrick And Dundas St W	43.654413	-79.390902	[{"label": "display", "lat": 43.65441282740799...	176	M5T 2W5	CA	Toronto	
3	Manpuku まんぷく	Japanese Restaurant	105 McCaul St. Unit 29-31	at Dundas St. W.	43.653612	-79.390613	[{"label": "display", "lat": 43.65361241179293...	151	M5T 2X4	CA	Toronto	
4	Aboveground Art Supplies	Arts & Crafts Store	74 McCaul St	Dundas St.	43.652646	-79.390925	[{"label": "display", "lat": 43.65264564807000...	225	M5T 3K2	CA	Toronto	
5	Art Gallery of Ontario	Art Gallery	317 Dundas St W	at Beverley St	43.654003	-79.392922	[{"label": "display", "lat": 43.65400286033738...	332	M5T 1G4	CA	Toronto	
6	Ontario College of Art and Design University (...)	University	100 McCaul St	at Dundas St W	43.652803	-79.391074	[{"label": "display", "lat": 43.65280251171013...	224	M5T 1W1	CA	Toronto	
7	Provo Food Bar	Tapas Restaurant	308 Dundas Street West	McCaul	43.654293	-79.391788	[{"label": "display", "lat": 43.65429312397438...	243	M5T 1G4	CA	Toronto	
8	Japango	Sushi Restaurant	122 Elizabeth St.	at Dundas St. W	43.655268	-79.385165	[{"label": "display", "lat": 43.65526771691681...	326	M5G 1P5	CA	Toronto	
9	Rolltation	Japanese Restaurant	207 Dundas St W	at University Ave	43.654918	-79.387424	[{"label": "display", "lat": 43.65491791857301...	153	M5G 1C8	CA	Toronto	
10	Friendly Stranger - Cannabis Culture Shop	Smoke Shop	241 Queen St. W	at St. Patrick St.	43.650387	-79.388523	[{"label": "display", "lat": 43.65038666611463...	398	M5V 1Z4	CA	Toronto	
11	Sansotei Ramen 三草亭	Ramen Restaurant	179 Dundas St. W	btwn Centre Ave. & Chestnut St.	43.655157	-79.386501	[{"label": "display", "lat": 43.65515746756124...	227	M5G 1Z8	CA	Toronto	
12	Fugo Desserts	Ice Cream Shop	205 Dundas Street W	at University Ave	43.654923	-79.387382	[{"label": "display", "lat": 43.65492255672213...	156	NaN	CA	Toronto	
13	Jimmy's Coffee	Café	166 McCaul Street	NaN	43.655827	-79.392042	[{"label": "display", "lat": 43.65582710322224...	333	M5T 1J7	CA	Toronto	

	name	categories	address	crossStreet	lat	lng	labeledLatLngs	distance	postalCode	cc	city	st
14	Four Seasons Centre for the Performing Arts	Concert Hall	145 Queen St. W	at University Ave.	43.650592	-79.385806	[{"label": "display", "lat": 43.650592, "lng": ...}	446	M5H 4G1	CA	Toronto	
15	Vegetarian Haven	Vegetarian / Vegan Restaurant	17 Baldwin St	NaN	43.656016	-79.392758	[{"label": "display", "lat": 43.65601602835709...	392	M5T 1L1	CA	Toronto	
16	Kekou Gelato House	Ice Cream Shop	13 Baldwin St	btwn Beverley & McCaul	43.656099	-79.392715	[{"label": "display", "lat": 43.65609938127313...	394	M5T 1L1	CA	Toronto	
17	Norma Ridley Members' Lounge	Art Gallery	317 Dundas Street West	AGO	43.652786	-79.392293	[{"label": "display", "lat": 43.65278556636435...	310	M5T 1G4	CA	Toronto	
18	Nathan Phillips Square	Plaza	100 Queen St W	at Bay St	43.652270	-79.383516	[{"label": "display", "lat": 43.65227047322295...	465	M5H 2N1	CA	Toronto	
19	Umbra Concept Store	Furniture / Home Store	165 John St.	at Queen St. W	43.650417	-79.391136	[{"label": "display", "lat": 43.650417, "lng": ...}	437	M5T 1X3	CA	Toronto	
20	Poke Guys	Poke Place	112 Elizabeth St	at Dundas St W	43.654895	-79.385052	[{"label": "display", "lat": 43.65489527525682...	319	M5G 1P5	CA	Toronto	
21	Chatime 日出茶太	Bubble Tea Shop	132 Dundas St W	btwn Bay & University	43.655542	-79.384684	[{"label": "display", "lat": 43.65554164147378...	375	M5G 1C3	CA	Toronto	
22	JaBistro	Sushi Restaurant	222 Richmond St W	NaN	43.649687	-79.388090	[{"label": "display", "lat": 43.64968685893743...	479	M5V 1W4	CA	Toronto	
23	Grange Park	Park	NaN	NaN	43.652488	-79.392053	[{"label": "display", "lat": 43.65248755299856...	309	NaN	CA	Toronto	
24	Civello Salon & Spa	Salon / Barbershop	269 Queen St W	at Duncan St.	43.650020	-79.389400	[{"label": "display", "lat": 43.6500197743058,...}	441	NaN	CA	Toronto	
25	Rosalinda	Vegetarian / Vegan Restaurant	133 Richmond St W	NaN	43.650252	-79.385156	[{"label": "display", "lat": 43.65025248306929...	506	M5H 2L2	CA	Toronto	
26	Daily Press Juicery	Juice Bar	200 Queen St W	at St. Patrick St	43.650388	-79.388792	[{"label": "display", "lat": 43.65038785952372...	397	M5V 1Z2	CA	Toronto	
27	The Rex Hotel Jazz & Blues Bar	Jazz Club	194 Queen St W	Queen & St. Patrick	43.650505	-79.388577	[{"label": "display", "lat": 43.65050475544005...	385	M5V 1Z1	CA	Toronto	
28	Green Box Fresh Food Bar	Sandwich Place	200 University Ave	NaN	43.650438	-79.388611	[{"label": "display", "lat": 43.65043758181795...	392	NaN	CA	Toronto	
29	Shangri-La Toronto	Hotel	188 University Ave.	at Adelaide St. W	43.649129	-79.386557	[{"label": "display", "lat": 43.64912919417502...	567	M5H 0A3	CA	Toronto	

In [35]:

```
category2=dataframe_filtered[["categories"]]
category2=category2.rename(columns={"categories": "Entertainment District Trending Venue Categories"}, errors="raise")
category2
```

Out[35]:

Entertainment District Trending Venue Categories	
0	Breakfast Spot
1	Neighborhood
2	Coffee Shop
3	Japanese Restaurant
4	Arts & Crafts Store
5	Art Gallery
6	University
7	Tapas Restaurant
8	Sushi Restaurant
9	Japanese Restaurant
10	Smoke Shop
11	Ramen Restaurant
12	Ice Cream Shop
13	Café
14	Concert Hall
15	Vegetarian / Vegan Restaurant
16	Ice Cream Shop
17	Art Gallery
18	Plaza
19	Furniture / Home Store
20	Poke Place
21	Bubble Tea Shop
22	Sushi Restaurant
23	Park
24	Salon / Barbershop
25	Vegetarian / Vegan Restaurant
26	Juice Bar
27	Jazz Club
28	Sandwich Place
29	Hotel

In [36]:

```
category = pd.concat([category1, category2], axis=1, sort=False)
category
```

Out[36]:

	Financial District Trending Venue Categories	Entertainment District Trending Venue Categories
0	Cosmetics Shop	Breakfast Spot
1	Clothing Store	Neighborhood
2	Theater	Coffee Shop
3	Bookstore	Japanese Restaurant
4	Plaza	Arts & Crafts Store
5	Neighborhood	Art Gallery
6	Theater	University
7	Shopping Mall	Tapas Restaurant
8	Breakfast Spot	Sushi Restaurant
9	Restaurant	Japanese Restaurant
10	Plaza	Smoke Shop
11	American Restaurant	Ramen Restaurant
12	Cosmetics Shop	Ice Cream Shop
13	Electronics Store	Café
14	Monument / Landmark	Concert Hall
15	Furniture / Home Store	Vegetarian / Vegan Restaurant
16	Pizza Place	Ice Cream Shop
17	Clothing Store	Art Gallery
18	Bakery	Plaza
19	Comic Shop	Furniture / Home Store
20	Department Store	Poke Place
21	Sushi Restaurant	Bubble Tea Shop
22	Electronics Store	Sushi Restaurant
23	Fast Food Restaurant	Park
24	Miscellaneous Shop	Salon / Barbershop
25	Clothing Store	Vegetarian / Vegan Restaurant
26	Tea Room	Juice Bar
27	Clothing Store	Jazz Club
28	Bubble Tea Shop	Sandwich Place
29	Italian Restaurant	Hotel

In []:

```
Restaurants2=category.to_excel(r'C:\Users\kensh\Documents\Mis\Continue Education\Cousera\IBM Data Science Profession
```

A side-by-side comparison shows that the trending venue categories in the Financial District are mostly businesses and shops, while the trending venue categories in the Entertainment District are mostly food, entertainment and recreation.

We would like to open the high-end asian restaurant at where the target market lives, works and/plays. Right now, it appears that the Financial District is where the target market works, while the Entertainment District is where the target market plays and relaxes.

Besides location and target market, competition is also an important factor to consider. As mentioned before, we do not want to open the new restaurant in an area that is saturated already or where competition is too fierce.

Let's find out how many restaurants are in the Financial District.

In [37]:

```
latitude=43.6479
longitude=-79.3818
VERSION="20200316"

search_query = 'restaurant'
radius = 500

url = 'https://api.foursquare.com/v2/venues/search?client_id={}&client_secret={}&ll={},{}&v={}&query={}&radius={}&limit={}'

results = requests.get(url).json()

# assign relevant part of JSON to venues
venues = results['response']['venues']

# tranform venues into a dataframe
dataframe = json_normalize(venues)

# Define information of interest and filter dataframe.

# keep only columns that include venue name, and anything that is associated with location
filtered_columns = ['name', 'categories'] + [col for col in dataframe.columns if col.startswith('location.')] + ['id']
dataframe_filtered3 = dataframe.loc[:, filtered_columns]

# function that extracts the category of the venue
def get_category_type(row):
    try:
        categories_list = row['categories']
    except:
        categories_list = row['venue.categories']

    if len(categories_list) == 0:
        return None
    else:
        return categories_list[0]['name']

# filter the category for each row
dataframe_filtered3['categories'] = dataframe_filtered3.apply(get_category_type, axis=1)

# clean column names by keeping only last term
dataframe_filtered3.columns = [column.split('.')[-1] for column in dataframe_filtered3.columns]

#dataframe_filtered.head()

dataframe_filtered3
```

Out[37]:

	name	categories	address	lat	lng	labeledLatLngs	distance	postalCode	cc	city	state	country	f
0	Hemispheres Restaurant & Bistro	American Restaurant	110 Chestnut Street	43.654884	-79.385931	[{'label': 'display', 'lat': 43.654884, 'lng': -79.385931, 'distance': 348, 'postalCode': 'M5G 1R3', 'cc': 'CA', 'city': 'Toronto', 'state': 'ON', 'country': 'Canada'}]	348	M5G 1R3	CA	Toronto	ON	Canada	1
1	Richtree Natural Market Restaurants	Restaurant	14 Queen St W	43.652614	-79.380231	[{'label': 'display', 'lat': 43.652614, 'lng': -79.380231, 'distance': 196, 'postalCode': 'M5H 3X4', 'cc': 'CA', 'city': 'Toronto', 'state': 'ON', 'country': 'Canada'}]	196	M5H 3X4	CA	Toronto	ON	Canada	1
2	The Senator Restaurant	Diner	249 Victoria Street	43.655641	-79.379199	[{'label': 'display', 'lat': 43.655641, 'lng': -79.379199, 'distance': 280, 'postalCode': 'M5B 1T8', 'cc': 'CA', 'city': 'Toronto', 'state': 'ON', 'country': 'Canada'}]	280	M5B 1T8	CA	Toronto	ON	Canada	1
3	Hendricks Restaurant & Bar	Restaurant	Yonge And Queen	43.653415	-79.379698	[{'label': 'display', 'lat': 43.653415, 'lng': -79.379698, 'distance': 179, 'postalCode': 'M5G 2H6', 'cc': 'CA', 'city': 'Toronto', 'state': 'ON', 'country': 'Canada'}]	179	M5G 2H6	CA	Toronto	ON	Canada	1
4	Kyoto House Japanese Restaurant	Sushi Restaurant	143 Dundas St. West	43.655381	-79.385270	[{'label': 'display', 'lat': 43.655381, 'lng': -79.385270, 'distance': 320, 'postalCode': 'M5G 1C7', 'cc': 'CA', 'city': 'Toronto', 'state': 'ON', 'country': 'Canada'}]	320	NaN	CA	Toronto	ON	Canada	1
5	Yueh Tung Chinese Restaurant	Chinese Restaurant	126 Elizabeth St.	43.655281	-79.385337	[{'label': 'display', 'lat': 43.655281, 'lng': -79.385337, 'distance': 320, 'postalCode': 'M5G 1C7', 'cc': 'CA', 'city': 'Toronto', 'state': 'ON', 'country': 'Canada'}]	320	NaN	CA	Toronto	ON	Canada	1
6	Akashiro Japanese Restaurant & Bar	Sushi Restaurant	220 Yonge St.	43.655965	-79.380541	[{'label': 'display', 'lat': 43.655965, 'lng': -79.380541, 'distance': 244, 'postalCode': 'M5G 1C7', 'cc': 'CA', 'city': 'Toronto', 'state': 'ON', 'country': 'Canada'}]	244	NaN	CA	Toronto	ON	Canada	1
7	Hong Shing Chinese Restaurant	Chinese Restaurant	195 Dundas St W	43.654925	-79.387089	[{'label': 'display', 'lat': 43.654925, 'lng': -79.387089, 'distance': 439, 'postalCode': 'M5G 1C7', 'cc': 'CA', 'city': 'Toronto', 'state': 'ON', 'country': 'Canada'}]	439	M5G 1C7	CA	Toronto	ON	Canada	1

	name	categories	address	lat	lng	labeledLatLngs	distance	postalCode	cc	city	state	country	f
8	Castries Bar & Five Way Restaurant	Caribbean Restaurant	NaN	43.654728	-79.380928	[{"label": "display", "lat": 43.65472793579101...	110	NaN	CA	NaN	NaN	Canada	
9	Cru Restaurant	Restaurant	100 Yonge St	43.649820	-79.378350	[{"label": "display", "lat": 43.64982, "lng": ...	538	M5C 2W1	CA	Toronto	ON	Canada	.
10	Golden Thai Restaurant	Thai Restaurant	105 Church St	43.652525	-79.375369	[{"label": "display", "lat": 43.65252473089013...	542	M5C 2G3	CA	Toronto	ON	Canada	
11	Restaurant Adelaide	Restaurant	325 Bay St (31st floor)	43.649563	-79.380590	[{"label": "display", "lat": 43.649563, "lng":....	499	M5H	CA	Toronto	ON	Canada	
12	Wah Too Seafood Restaurant	Chinese Restaurant	56 Centre Ave.	43.654833	-79.387206	[{"label": "display", "lat": 43.65483285234745...	446	M5G 1R5	CA	Toronto	ON	Canada	
13	Maezo Restaurant & Bar	Indian Restaurant	67 Richmond Street West	43.651091	-79.381843	[{"label": "display", "lat": 43.65109052088520...	319	M5H 1Z5	CA	Toronto	ON	Canada	
14	Adega Restaurant	Restaurant	33 Elm St	43.657519	-79.383462	[{"label": "display", "lat": 43.65751886446546...	417	M5G 1H1	CA	Toronto	ON	Canada	
15	Osgoode Hall Restaurant	New American Restaurant	130 Queen St W	43.651979	-79.385049	[{"label": "display", "lat": 43.65197895903515...	342	M5H 2N6	CA	NaN	NaN	Canada	
16	Terrace Restaurant at Elmwood	American Restaurant	NaN	43.656101	-79.381480	[{"label": "display", "lat": 43.65610066909799...	239	NaN	CA	NaN	NaN	Canada	
17	New Treasure Restaurant	Dim Sum Restaurant	150 Dundas St W	43.655384	-79.385362	[{"label": "display", "lat": 43.65538444237565...	327	NaN	CA	Toronto	ON	Canada	
18	Donatello Restaurant	Italian Restaurant	37 Elm St.	43.657489	-79.383605	[{"label": "display", "lat": 43.65748931028801...	418	M5G 1H1	CA	Toronto	ON	Canada	l
19	The Elm Tree Restaurant	Modern European Restaurant	43 Elm St	43.657397	-79.383761	[{"label": "display", "lat": 43.65739749535259...	413	M5G 1H1	CA	Toronto	ON	Canada	
20	Spring Rolls Japanese Restaurant in Toronto	Theme Restaurant	40 Dundas St W Box 36,	43.656105	-79.383495	[{"label": "display", "lat": 43.65610515821675...	274	M5G 2C2	CA	Toronto	ON	Canada	
21	Yulla Asian Fusion Restaurant	Asian Restaurant	NaN	43.651587	-79.379232	[{"label": "display", "lat": 43.651587, "lng":....	335	NaN	CA	Toronto	ON	Canada	
22	Maezo Restaurant	Indian Restaurant	67 Richmond St West	43.651395	-79.381888	[{"label": "display", "lat": 43.6513954168839,...	285	M5H 1W2	CA	Toronto	ON	Canada	
23	Cali Restaurant	Vietnamese Restaurant	179 Dundas St. W.	43.655068	-79.386375	[{"label": "display", "lat": 43.65506808, "lng":...	388	M5G	CA	Toronto	ON	Canada	[
24	Tundra Restaurant	Restaurant	145 Richmond Street West	43.650010	-79.385608	[{"label": "display", "lat": 43.65000998764964...	536	M5H 2L2	CA	Toronto	ON	Canada	;
25	Alio Restaurant & Wine Bar	Italian Restaurant	108 Dundas St W	43.655655	-79.384124	[{"label": "display", "lat": 43.65565507065502...	265	M5G 1C3	CA	Toronto	ON	Canada	
26	TCJ Restaurant	Asian Restaurant	64B Queen St E	43.653291	-79.375343	[{"label": "display", "lat": 43.65329078510988...	525	M5C 2T3	CA	Toronto	ON	Canada	
27	Good View Chinese Restaurant	Chinese Restaurant	132 Dundas Street East	43.656791	-79.376139	[{"label": "display", "lat": 43.65679124992238...	554	NaN	CA	Toronto	ON	Canada	[
28	Joe's Indian Restaurant	Indian Restaurant	NaN	43.658150	-79.381563	[{"label": "display", "lat": 43.65814977325445...	466	NaN	CA	NaN	NaN	Canada	
29	Vineyard Jamaican Restaurant	Caribbean Restaurant	NaN	43.649550	-79.380780	[{"label": "display", "lat": 43.64955, "lng": ...	498	NaN	CA	Bolton	ON	Canada	

In [45]:

```
Restaurant3=dataframe_filtered3.to_excel(r'C:\Users\kensh\Documents\Mis\Continue Education\Cousera\IBM Data Science
```

Let's find out how many entries will be returned with the keyword search "restaurant" in the Entertainment District.

In [38]:

```
latitude=43.6427
longitude=-79.3888
VERSION="20200316"

search_query = 'restaurant'
radius = 500

url = 'https://api.foursquare.com/v2/venues/search?client_id={}&client_secret={}&ll={},{&v={}&query={}&radius={}&limit={}'

results = requests.get(url).json()

# assign relevant part of JSON to venues
venues = results['response']['venues']

# tranform venues into a dataframe
dataframe = json_normalize(venues)

# Define information of interest and filter dataframe.

# keep only columns that include venue name, and anything that is associated with location
filtered_columns = ['name', 'categories'] + [col for col in dataframe.columns if col.startswith('location.')] + ['id']
dataframe_filtered4= dataframe.loc[:, filtered_columns]

# function that extracts the category of the venue
def get_category_type(row):
    try:
        categories_list = row['categories']
    except:
        categories_list = row['venue.categories']

    if len(categories_list) == 0:
        return None
    else:
        return categories_list[0]['name']

# filter the category for each row
dataframe_filtered4['categories'] = dataframe_filtered4.apply(get_category_type, axis=1)

# clean column names by keeping only last term
dataframe_filtered4.columns = [column.split('.')[0] for column in dataframe_filtered4.columns]

#dataframe_filtered.head()

dataframe_filtered4
```

Out[38]:

	name	categories	address	lat	lng	labeledLatLngs	distance	postalCode	cc	city	state	country	f
0	Hemispheres Restaurant & Bistro	American Restaurant	110 Chestnut Street	43.654884	-79.385931	[{'label': 'display', 'lat': 43.654884, 'lng': -79.385931, 'distance': 252, 'postalCode': 'M5G 1R3', 'cc': 'CA', 'city': 'Toronto', 'state': 'ON', 'country': 'Canada'}]	252	M5G 1R3	CA	Toronto	ON	Canada	1
1	North-East Chinese Restaurant 華北美食	Chinese Restaurant	476 Dundas St.	43.653185	-79.396677	[{'label': 'display', 'lat': 43.653185, 'lng': -79.396677, 'distance': 640, 'postalCode': 'M5G 1R5', 'cc': 'CA', 'city': 'Toronto', 'state': 'ON', 'country': 'Canada'}]	640	NaN	CA	Toronto	ON	Canada	
2	Some Time BBQ Grill Restaurant 碳烤屋	Szechuan Restaurant	988 Baldwin Street	43.655874	-79.393826	[{'label': 'display', 'lat': 43.655874, 'lng': -79.393826, 'distance': 457, 'postalCode': 'M5T 2Z5', 'cc': 'CA', 'city': 'Toronto', 'state': 'ON', 'country': 'Canada'}]	457	NaN	CA	Toronto	ON	Canada	S
3	Hong Shing Chinese Restaurant	Chinese Restaurant	195 Dundas St W	43.654925	-79.387089	[{'label': 'display', 'lat': 43.654925, 'lng': -79.387089, 'distance': 174, 'postalCode': 'M5G 1C7', 'cc': 'CA', 'city': 'Toronto', 'state': 'ON', 'country': 'Canada'}]	174	M5G 1C7	CA	Toronto	ON	Canada	(
4	Wah Too Seafood Restaurant	Chinese Restaurant	56 Centre Ave.	43.654833	-79.387206	[{'label': 'display', 'lat': 43.654833, 'lng': -79.387206, 'distance': 160, 'postalCode': 'M5G 1R5', 'cc': 'CA', 'city': 'Toronto', 'state': 'ON', 'country': 'Canada'}]	160	M5G 1R5	CA	Toronto	ON	Canada	
5	Anoush Restaurant	Restaurant	250 Dundas St W	43.654588	-79.389692	[{'label': 'display', 'lat': 43.654588, 'lng': -79.389692, 'distance': 100, 'postalCode': 'M5T 2Z5', 'cc': 'CA', 'city': 'Toronto', 'state': 'ON', 'country': 'Canada'}]	100	M5T 2Z5	CA	Toronto	ON	Canada	
6	Dim Sum King Seafood Restaurant	Dim Sum Restaurant	421 Dundas St W	43.653503	-79.395405	[{'label': 'display', 'lat': 43.653503, 'lng': -79.395405, 'distance': 534, 'postalCode': 'M5T 2W4', 'cc': 'CA', 'city': 'Toronto', 'state': 'ON', 'country': 'Canada'}]	534	M5T 2W4	CA	Toronto	ON	Canada	
7	Kyoto House Japanese Restaurant	Sushi Restaurant	143 Dundas St. West	43.655381	-79.385270	[{'label': 'display', 'lat': 43.655381, 'lng': -79.385270, 'distance': 325, 'postalCode': 'M5G 1R3', 'cc': 'CA', 'city': 'Toronto', 'state': 'ON', 'country': 'Canada'}]	325	NaN	CA	Toronto	ON	Canada	

	name	categories	address	lat	lng	labeledLatLngs	distance	postalCode	cc	city	state	country	f
8	Yueh Tung Chinese Restaurant	Chinese Restaurant	126 Elizabeth St.	43.655281	-79.385337	[{"label": "display", "lat": 43.65528126342919...	315	NaN	CA	Toronto	ON	Canada	
9	Fune Japanese Restaurant	Japanese Restaurant	100 Simcoe St.	43.648514	-79.386457	[{"label": "display", "lat": 43.64851365544565...	635	NaN	CA	Toronto	ON	Canada	[
10	Cali Restaurant	Vietnamese Restaurant	179 Dundas St. W.	43.655068	-79.386375	[{"label": "display", "lat": 43.65506808, "lng": ...	230	M5G	CA	Toronto	ON	Canada	[
11	Wah Sing Seafood Restaurant	Chinese Restaurant	47 Baldwin Street	43.655936	-79.393783	[{"label": "display", "lat": 43.65593557082916...	457	M5T 1L1	CA	Toronto	ON	Canada	[
12	New Treasure Restaurant	Dim Sum Restaurant	150 Dundas St W	43.655384	-79.385362	[{"label": "display", "lat": 43.65538444237565...	318	NaN	CA	Toronto	ON	Canada	
13	Osgoode Hall Restaurant	New American Restaurant	130 Queen St W	43.651979	-79.385049	[{"label": "display", "lat": 43.65197895903515...	374	M5H 2N6	CA	NaN	NaN	Canada	
14	New Hong Fatt BBQ Restaurant 新鴻發美食軒	Chinese Restaurant	443 Dundas St W	43.653342	-79.396007	[{"label": "display", "lat": 43.65334218256763...	584	NaN	CA	Toronto	ON	Canada	
15	Adega Restaurant	Restaurant	33 Elm St	43.657519	-79.383462	[{"label": "display", "lat": 43.65751886446546...	584	M5G 1H1	CA	Toronto	ON	Canada	
16	Tundra Restaurant	Restaurant	145 Richmond Street West	43.650010	-79.385608	[{"label": "display", "lat": 43.65000998764964...	509	M5H 2L2	CA	Toronto	ON	Canada	;
17	Little India Restaurant	Indian Restaurant	255 Queen St. W	43.650319	-79.388998	[{"label": "display", "lat": 43.65031880877208...	405	M5V 1Z4	CA	Toronto	ON	Canada	l
18	Kowloon Seafood Dim Sum Restaurant	Chinese Restaurant	5 Baldwin St	43.656217	-79.392418	[{"label": "display", "lat": 43.65621662983656...	384	M5T 1L1	CA	Toronto	ON	Canada	
19	Akashiro Japanese Restaurant & Bar	Sushi Restaurant	220 Yonge St.	43.655965	-79.380541	[{"label": "display", "lat": 43.65596504293232...	701	NaN	CA	Toronto	ON	Canada	
20	East Restaurant Asian Street Flair	Asian Restaurant	240 Queen Street West	43.649985	-79.390563	[{"label": "display", "lat": 43.64998452583986...	465	M5v1z7	CA	Toronto	ON	Canada	
21	Donatello Restaurant	Italian Restaurant	37 Elm St.	43.657489	-79.383605	[{"label": "display", "lat": 43.65748931028801...	573	M5G 1H1	CA	Toronto	ON	Canada	l
22	Harmony Chinese Restaurant	Chinese Restaurant	478 Dundas Street West	43.653427	-79.397030	[{"label": "display", "lat": 43.653427, "lng": ...	665	M5T 1G9	CA	Toronto	ON	Canada	[
23	The Elm Tree Restaurant	Modern European Restaurant	43 Elm St	43.657397	-79.383761	[{"label": "display", "lat": 43.65739749535259...	557	M5G 1H1	CA	Toronto	ON	Canada	
24	The Winding Road Restaurant	Chinese Restaurant	5 Baldwin St	43.656013	-79.392451	[{"label": "display", "lat": 43.656013, "lng": ...	372	M5T 1L1	CA	Toronto	ON	Canada	
25	Rol Jui Seafood Restaurant	Chinese Restaurant	472 Dundas St	43.653153	-79.396877	[{"label": "display", "lat": 43.65315284886056...	656	NaN	CA	Toronto	ON	Canada	
26	Bodega Restaurant	French Restaurant	30 Baldwin St	43.655961	-79.393675	[{"label": "display", "lat": 43.655961, "lng": ...	451	M5T 1L3	CA	Toronto	ON	Canada	
27	Zhu's Restaurant	Chinese Restaurant	1 Baldwin Street	43.656277	-79.392393	[{"label": "display", "lat": 43.656277, "lng": ...	387	NaN	CA	Toronto	ON	Canada	.
28	spring garden Restaurant	Chinese Restaurant	NaN	43.655209	-79.393444	[{"label": "display", "lat": 43.65520868595963...	398	NaN	CA	NaN	NaN	Canada	
29	Toronto Big Bowl Restaurant	Szechuan Restaurant	45 Baldwin St	43.655934	-79.393731	[{"label": "display", "lat": 43.655934, "lng": ...	453	M5T 1L1	CA	Toronto	ON	Canada	

```
In [46]: Restaurants4=dataframe_filtered4.to_excel(r'C:\Users\kensh\Documents\Mis\Continue Education\Cousera\IBM Data Science\')
<----->
```

Within the given radius, both districts have the equal number of restaurants. A quick analysis on the categories column shows that the Entertainment District is far more saturated with asian restaurants than the financial district. Saturation implies fierce competition or even little appetite for a new culinary establishment. Does this mean that the new restaurant should be opened in the Financial District?

Not necessarily. There are cultural and lifestyle aspects that Foursquare's location data could not tell us.

III.2: Other research and analysis

Critical non-data information gathered from wikipedia and wikivoyage:

```
In [54]: from IPython.display import Image
Image(filename="19.png",width = 1000, height=300)
```

Out[54]:

The bank towers and much else in Toronto's core are connected by a system of underground walkways, known as **PATH**, which is lined with retail establishments making the area one of Toronto's most important shopping districts. The vast majority of these stores are only open during weekdays during the business day when the financial district is populated. During the evenings and weekends, the walkways remain open but the area is almost deserted and most of the stores are closed.



```
In [52]: Image(filename="18.png",width=1000,height=300)
```

Out[52]:

The **Entertainment and Financial Districts**, along with Yonge-Dundas to the north, form the heart of Toronto's downtown. By day, the suits and powerbrokers of the Financial District drive the city's economy from their glass and steel towers. But as night comes, the towers empty and people pour into the Entertainment District to catch the show, see the game or party at the clubs. Whether it's day or night, many of Toronto's larger attractions are located here, so it's an essential part of any visit to Toronto.



Location of the

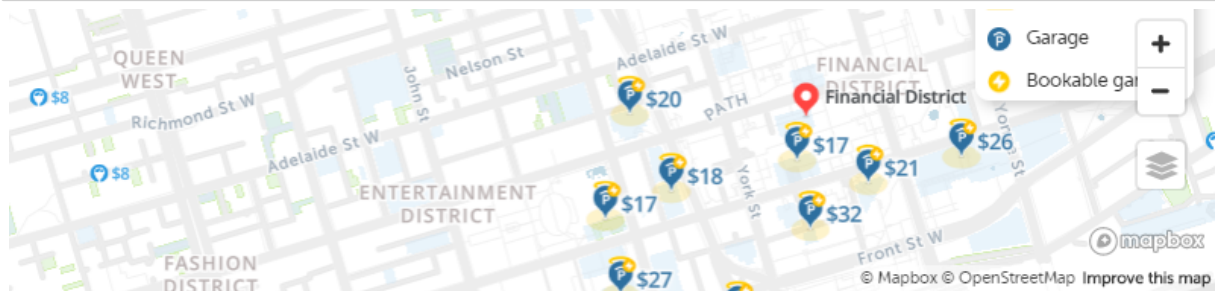
What we can see from the two websites is that during the evenings and weekends, the businesses and shops in the Financial District are closed and the area is almost deserted. Even during the weekdays, as the night comes, people leave the Financial District and pour into the Entertainment District for the food, the fun and the entertainment. This is a cultural, lifestyle and psychographic information that data cannot tell us, but nonetheless too important for ANY business owner to ignore. A well-rounded decision should take such information into account and that's what we are trying to do here. We will combine the insights from data and cultural and lifestyle information to make a well-rounded recommendation on the best location for a high-end asian restaurant in Downtown Toronto.

Next, we are going to examine one of the most important factor when choosing a location for a restaurant: accesibility / parking.

Parking / Accessibility

```
In [55]: Image(filename="20.png",width=1000,height=300)
```

Out[55]:



This map show parking in the Financial District and Entertainment District. Finding parking is a challenge in Downtown Toronto. A lot of the parking is fee-based parking. The rates shown are two-hour rate. In general, free parking is very limited throughout Toronto.

Average income in the Financial / Entertainment Districts

The following information is based on past census.

- Average income in Entertainment District.

In [57]: Image(filename="21.png",width=1000,height=300)

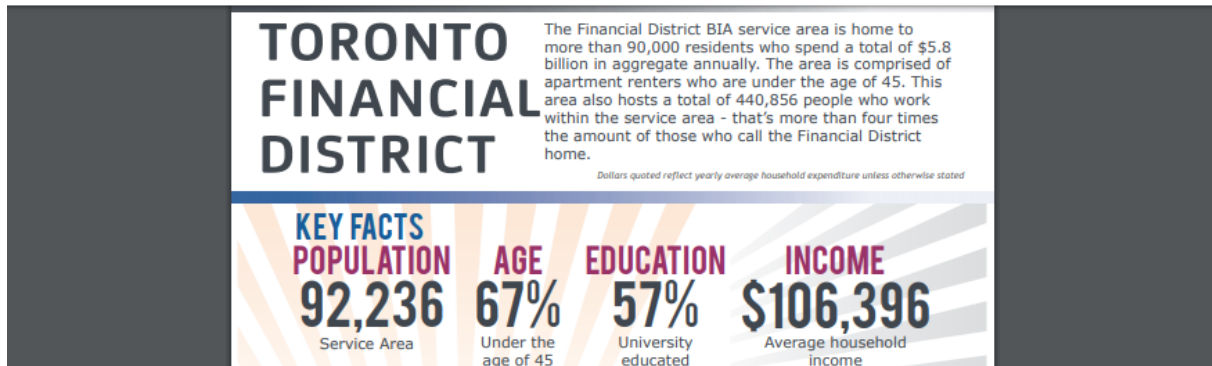
Out[57]:



- Average income in Financial District.

In [58]: Image(filename="22.png",width=1000,height=300)

Out[58]:



IV: Summary of results

- There are 40 restaurants/asian restaurants in Downtown Toronoto. This number does not even include other eateries such as bars and bistros. Downtown Toronto, in addition to its other roles, is a hot spot for gourmet food in Toronto.
- Most of the asian restaurants in Downtown Toronto are concentrated in Chinatown and Little Tokyo, whereas in other areas such as the Financial District and the Entertainment District, it is not as saturated as in Chinatown and Little Tokyo.
- Most of the trending venues in the Financial District are businesses and shops that close in the evening and during the weekends, while the trending venues in the Entertainment District are culinary establishments, pubs and other recreations that thrive when the night comes and people leave the financial district and pour into the Entertainment District.
- There are plenty of accessible parking, although not free, in the Financial District and Entertainment District, especially in ther intersection of the two districts.
- Both the Entertainment District and Financial District are high-income neighbourhoods.

V: Discussions

Based on the analysis on the data and other non-data critical information, we recommend the high-end asian restaurant to be open in the side of the Entertainment District that is closed to the Financial District.

The new restaurant will target young, middle-aged customers with income in the higher range, a group of the population with financial freedom. Ideally, we would like the new restaurants to be situated where its target market lives, works and / or plays.

Initial analysis on the data shows that Chinatown or Little Tokyo might be good candidate locations. However, those two neighborhoods are already saturated with Asian restaurants. It is unlikely that people in those two neighborhoods have appetite for a high-end restaurant where the menu prices might be higher than at the restaurant around the corner of the street.

I therefore narrowed down the choices to the Financial District and the Entertainment District. The data showed that while both districts are equally populated with restaurants, the Entertainment District is more saturated with Asian restaurants than the Financial District. Saturation often implies fierce competition.

Furthermore, the average income in the Financial District is much higher than the average income in the Entertainment District. It seems that people in the Financial District is more likely (and may be more frequently as well) to dine at a high-end restaurant, due to their financial freedom.

However, there are some cultural and lifestyle aspects that must be taken into account when considering whether to open the high-end restaurant in Financial District or Entertainment District. It is true that the Financial District is not as saturated with Asian restaurants as the Entertainment District; it is also an economic powerhouse, full of customers capable to frequently dine at a high-end restaurant. However, that is during the working hours. As night falls, people leave the Financial District and pour into the Entertainment District for the shows and parties. In the evenings and during the weekends, the walkways in the Financial District are almost deserted. These cultural and lifestyle aspects make the Financial District less than ideal. The evenings, especially 6:00 PM to 9:00 PM are considered to be the Golden Hours for restaurant businesses. The Golden Hours are exactly when people leave the Financial District and flock into the Entertainment District. Furthermore, past surveys showed that the higher a customer's income, the less likely the customer will spend money on afternoon meal, a meal the customer has during his working hours in the Financial District.

VI: Conclusion

All things considered, I do not recommend opening the high-end asian restaurant in the Financial District. A well-rounded business decision should take all factors into consideration, especially the factors that have a direct impact on the business. I recommend opening it on side of the Entertainment District that is near the Financial District. More specifically, I recommend situating the new high-end Asian restaurant on or near the University Avenue. This is where the Entertainment District and Financial District connect with a lot of landmarks in the vicinity, Hotel Fairmont Royal York, InterContinental Toronto Centre, Ritz Carlton Toronto, Toronto Symphony Orchestra, Shangri-La Hotel Toronto, just to name a few. This is very business area with high foot and vehicle traffic, which translates into high visibility for the new high-end Asian restaurant. In addition to the high visibility that is desired, this is also an area that supports the business concept of the restaurant: a high-end Asian restaurant that serves gourmet Asian food to young and middle-aged customers with income in the higher range.

Finally, I strongly recommend talking a walk and chat with people to learn more about the area

In []: