

TorontoFinal3

July 21, 2021

0.1 Agrupacion y Segmentacion de Vecindarios de Toronto

Parte 1

```
[3]: !jupyter nbconvert --to html TorontoFinal3.ipynb
     # Importacion de Librerias necesarias
```

```
[NbConvertApp] Converting notebook TorontoFinal3.ipynb to html
[NbConvertApp] Writing 888437 bytes to TorontoFinal3.html
```

```
[4]: pip install BeautifulSoup4
```

```
Collecting BeautifulSoup4
  Downloading https://files.pythonhosted.org/packages/d1/41/e6495bd7d3781c
ee623ce23ea6ac73282a373088fcd0ddc809a047b18eae/beautifulsoup4-4.9.3-py3-none-
any.whl (115kB)
    | 122kB 27.1MB/s eta 0:00:01
Collecting soupsieve>1.2; python_version >= "3.0" (from BeautifulSoup4)
  Downloading https://files.pythonhosted.org/packages/36/69/d82d04022f02733bf9a7
2bc3b96332d360c0c5307096d76f6bb7489f7e57/soupsieve-2.2.1-py3-none-any.whl
Installing collected packages: soupsieve, BeautifulSoup4
Successfully installed BeautifulSoup4-4.9.3 soupsieve-2.2.1
Note: you may need to restart the kernel to use updated packages.
```

```
[5]: pip install lxml
```

```
Requirement already satisfied: lxml in
/home/jupyterlab/conda/envs/python/lib/python3.6/site-packages (4.6.3)
Note: you may need to restart the kernel to use updated packages.
```

```
[6]: from bs4 import BeautifulSoup
     import requests
     import pandas as pd
     import lxml
```

```
[7]: #Importacion , Scraping y Creacion de Dataframe
```

```
[8]: url =requests.get ("https://en.wikipedia.org/w/index.php?
     ↪title=List_of_postal_codes_of_Canada:_M&oldid=958430791").text
```

```
[9]: soup = BeautifulSoup(url,'lxml')
```

```
[10]: My_table = soup.find('table',{'class':'wikitable sortable'})
df = pd.read_html(str(My_table))[0]
df.head()
```

```
[10]:
```

	Postal Code	Borough	Neighborhood
0	M1A	Not assigned	NaN
1	M2A	Not assigned	NaN
2	M3A	North York	Parkwoods
3	M4A	North York	Victoria Village
4	M5A	Downtown Toronto	Regent Park, Harbourfront

```
[11]: # Eliminamos Municipios 'Not assigned'
```

```
[12]: drop_Not=df[df['Borough']=='Not assigned'].index
df.drop(drop_Not, inplace=True)
df.reset_index(drop=True, inplace=True)
```

```
[13]: df.head()
```

```
[13]:
```

	Postal Code	Borough	Neighborhood
0	M3A	North York	Parkwoods
1	M4A	North York	Victoria Village
2	M5A	Downtown Toronto	Regent Park, Harbourfront
3	M6A	North York	Lawrence Manor, Lawrence Heights
4	M7A	Downtown Toronto	Queen's Park, Ontario Provincial Government

```
[14]: # Asignamos Vecindarios 'Not assigned' a Municipio
```

```
[15]: df[df['Neighborhood']=='Not assigned']=df['Borough'].reset_index()
df.head()
```

```
[15]:
```

	Postal Code	Borough	Neighborhood
0	M3A	North York	Parkwoods
1	M4A	North York	Victoria Village
2	M5A	Downtown Toronto	Regent Park, Harbourfront
3	M6A	North York	Lawrence Manor, Lawrence Heights
4	M7A	Downtown Toronto	Queen's Park, Ontario Provincial Government

```
[16]: # Requerimiento filas-columnas
```

```
[17]: df.shape
```

```
[17]: (103, 3)
```

Parte 2

```
[18]: # Importacion de archivo csv con coordenadas
```

```
[19]: from io import StringIO

url = requests.get(' http://cocl.us/Geospatial_data')
csv_raw = StringIO(url.text)
datos_geo = pd.read_csv(csv_raw)
```

```
[20]: datos_geo.head()
```

```
[20]:   Postal Code   Latitude  Longitude
0         M1B  43.806686 -79.194353
1         M1C  43.784535 -79.160497
2         M1E  43.763573 -79.188711
3         M1G  43.770992 -79.216917
4         M1H  43.773136 -79.239476
```

```
[21]: # Relacionamos Dataframes
```

```
[22]: df=pd.merge(df,datos_geo,how='left')
```

```
[23]: df.head()
```

```
[23]:   Postal Code      Borough      Neighborhood \
0         M3A      North York      Parkwoods
1         M4A      North York      Victoria Village
2         M5A  Downtown Toronto  Regent Park, Harbourfront
3         M6A      North York  Lawrence Manor, Lawrence Heights
4         M7A  Downtown Toronto  Queen's Park, Ontario Provincial Government

      Latitude  Longitude
0  43.753259 -79.329656
1  43.725882 -79.315572
2  43.654260 -79.360636
3  43.718518 -79.464763
4  43.662301 -79.389494
```

Parte 3

```
[24]: # Importacion Librerias Necesarias
```

```
[25]: import numpy as np
import json
!conda install -c conda-forge geopy --yes
from geopy.geocoders import Nominatim
from pandas.io.json import json_normalize
import matplotlib.pyplot as plt
```

```
import matplotlib.cm as cm
import matplotlib.colors as colors
from sklearn.cluster import KMeans
import folium
print('Librerias importadas')
```

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

Package Plan

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

added / updated specs:

- geopy

The following packages will be downloaded:

package	build		
geographiclib-1.52	pyhd8ed1ab_0	35 KB	conda-forge
geopy-2.2.0	pyhd8ed1ab_0	67 KB	conda-forge
Total:		102 KB	

The following NEW packages will be INSTALLED:

geographiclib	conda-forge/noarch::geographiclib-1.52-pyhd8ed1ab_0
geopy	conda-forge/noarch::geopy-2.2.0-pyhd8ed1ab_0

Downloading and Extracting Packages

```
geographiclib-1.52 | 35 KB | ##### | 100%
geopy-2.2.0        | 67 KB | ##### | 100%
Preparing transaction: done
Verifying transaction: done
Executing transaction: done
Librerias importadas
```

[26]: *# Filtramos a Municipios que sean ' Toronto '*

```
Tor_d = df[df['Borough'].str.contains('Toronto')].reset_index(drop=True)
Tor_d.head()
```

```
[26]:
```

	Postal Code	Borough	Neighborhood \
0	M5A	Downtown Toronto	Regent Park, Harbourfront
1	M7A	Downtown Toronto	Queen's Park, Ontario Provincial Government
2	M5B	Downtown Toronto	Garden District, Ryerson
3	M5C	Downtown Toronto	St. James Town
4	M4E	East Toronto	The Beaches

	Latitude	Longitude
0	43.654260	-79.360636
1	43.662301	-79.389494
2	43.657162	-79.378937
3	43.651494	-79.375418
4	43.676357	-79.293031

```
[27]: # Obtenemos nro filas
```

```
Tor_d.shape
```

```
[27]: (39, 5)
```

```
[28]: # Obtenemos coordenadas para Toronto
```

```
address = 'Toronto, ON'

geolocator = Nominatim(user_agent="ny_explorer")
location = geolocator.geocode(address)
latitude = location.latitude
longitude = location.longitude
print('Coordenadas Toronto {}, {}'.format(latitude, longitude))
```

Coordenadas Toronto 43.6534817, -79.3839347.

```
[29]: # Creamos mapa de Toronto y añadimos los marcadores
```

```
map_Toronto = folium.Map(location=[latitude, longitude], zoom_start=10)

for lat, lng, borough, neighborhood in zip(Tor_d['Latitude'],
→Tor_d['Longitude'], Tor_d['Borough'], Tor_d['Neighborhood']):
    label = '{} {}'.format(neighborhood, borough)
    label = folium.Popup(label, parse_html=True)
    folium.CircleMarker(
        [lat, lng],
        radius=5,
        popup=label,
        color='blue',
        fill=True,
        fill_color='#3186cc',
```

```

        fill_opacity=2,
        parse_html=False).add_to(map_Toronto)

map_Toronto

```

[29]: <folium.folium.Map at 0x7fd9c14760f0>

[30]: *# Definimos version y credenciales para la API de Foursquare con un limite de*
→50 devoluciones

```

CLIENT_ID = 'DBBPKNBZNEC2JF04JL13AJ0JLMHLHOCYWGTY5ZXJFXRJXYD'
CLIENT_SECRET = 'YA51Q1Y4XHBRUZE1025SHVN3AKMX20MJHBBELSOBANSJWKMA'
VERSION = '20180605'
LIMIT = 50

```

[31]: *# Definimos funcion para obtener los 100 sitios en un radio de 500 mts para*
→cada barrio

```

def getNearbyVenues(names, latitudes, longitudes, radius=500):

    venues_list=[]
    for name, lat, lng in zip(names, latitudes, longitudes):
        print(name)

        # crear la URL de solicitud de API
        url = 'https://api.foursquare.com/v2/venues/explore?
        →&client_id={}&client_secret={}&v={}&ll={},{}&radius={}&limit={}'.format(
            CLIENT_ID,
            CLIENT_SECRET,
            VERSION,
            lat,
            lng,
            radius,
            LIMIT)

        # solicitud GET
        results = requests.get(url).json()["response"]["groups"][0]["items"]

        # regresa solo información relevante de cada sitio cercano
        venues_list.append([
            name,
            lat,
            lng,
            v['venue']['name'],
            v['venue']['location']['lat'],
            v['venue']['location']['lng'],
            v['venue']['categories'][0]['name']) for v in results])

```

```

nearby_venues = pd.DataFrame([item for venue_list in venues_list for item_
↪in venue_list])
nearby_venues.columns = ['Neighborhood',
                          'Neighborhood Latitude',
                          'Neighborhood Longitude',
                          'Venue',
                          'Venue Latitude',
                          'Venue Longitude',
                          'Venue Category']

return(nearby_venues)

```

```

[32]: # Corremos la funcion getNearbyVenues para cada barrio creando un Dataframe_
↪'Toronto_venues'

```

```

Toronto_venues = getNearbyVenues(names=Tor_d['Neighborhood'],
                                  latitudes=Tor_d['Latitude'],
                                  longitudes=Tor_d['Longitude'])

```

Regent Park, Harbourfront
 Queen's Park, Ontario Provincial Government
 Garden District, Ryerson
 St. James Town
 The Beaches
 Berczy Park
 Central Bay Street
 Christie
 Richmond, Adelaide, King
 Dufferin, Dovercourt Village
 Harbourfront East, Union Station, Toronto Islands
 Little Portugal, Trinity
 The Danforth West, Riverdale
 Toronto Dominion Centre, Design Exchange
 Brockton, Parkdale Village, Exhibition Place
 India Bazaar, The Beaches West
 Commerce Court, Victoria Hotel
 Studio District
 Lawrence Park
 Roselawn
 Davisville North
 Forest Hill North & West, Forest Hill Road Park
 High Park, The Junction South
 North Toronto West, Lawrence Park
 The Annex, North Midtown, Yorkville
 Parkdale, Roncesvalles
 Davisville

University of Toronto, Harbord
 Runnymede, Swansea
 Moore Park, Summerhill East
 Kensington Market, Chinatown, Grange Park
 Summerhill West, Rathnelly, South Hill, Forest Hill SE, Deer Park
 CN Tower, King and Spadina, Railway Lands, Harbourfront West, Bathurst Quay,
 South Niagara, Island airport
 Rosedale
 Stn A PO Boxes
 St. James Town, Cabbagetown
 First Canadian Place, Underground city
 Church and Wellesley
 Business reply mail Processing Centre, South Central Letter Processing Plant
 Toronto

[33]: *# mostramos Dataframe y revisamos tamaño*

```
print(Toronto_venues.shape)
Toronto_venues.head()
```

(1172, 7)

[33]:

	Neighborhood	Neighborhood	Latitude	Neighborhood	Longitude	\
--	--------------	--------------	----------	--------------	-----------	---

0	Regent Park, Harbourfront		43.65426		-79.360636	
1	Regent Park, Harbourfront		43.65426		-79.360636	
2	Regent Park, Harbourfront		43.65426		-79.360636	
3	Regent Park, Harbourfront		43.65426		-79.360636	
4	Regent Park, Harbourfront		43.65426		-79.360636	

	Venue	Venue	Latitude	Venue	Longitude	\
0	Roselle Desserts		43.653447		-79.362017	
1	Tandem Coffee		43.653559		-79.361809	
2	Cooper Koo Family YMCA		43.653249		-79.358008	
3	Body Blitz Spa East		43.654735		-79.359874	
4	Impact Kitchen		43.656369		-79.356980	

	Venue Category
0	Bakery
1	Coffee Shop
2	Distribution Center
3	Spa
4	Restaurant

[34]: *# Observemos cuantos sitios se devolvieron por barrio*

```
Toronto_venues.groupby('Neighborhood').count()
```


[34]:

Neighborhood	Latitude \
Berczy Park	50
Brockton, Parkdale Village, Exhibition Place	22
Business reply mail Processing Centre, South Ce...	17
CN Tower, King and Spadina, Railway Lands, Harb...	13
Central Bay Street	50
Christie	15
Church and Wellesley	50
Commerce Court, Victoria Hotel	50
Davisville	37
Davisville North	9
Dufferin, Dovercourt Village	16
First Canadian Place, Underground city	50
Forest Hill North & West, Forest Hill Road Park	4
Garden District, Ryerson	50
Harbourfront East, Union Station, Toronto Islands	50
High Park, The Junction South	24
India Bazaar, The Beaches West	19
Kensington Market, Chinatown, Grange Park	50
Lawrence Park	5
Little Portugal, Trinity	41
Moore Park, Summerhill East	3
North Toronto West, Lawrence Park	18
Parkdale, Roncesvalles	14
Queen's Park, Ontario Provincial Government	31
Regent Park, Harbourfront	44
Richmond, Adelaide, King	50
Rosedale	4
Roselawn	1
Runnymede, Swansea	36
St. James Town	50
St. James Town, Cabbagetown	49
Stn A PO Boxes	50
Studio District	37
Summerhill West, Rathnelly, South Hill, Forest ...	13
The Annex, North Midtown, Yorkville	21
The Beaches	4
The Danforth West, Riverdale	42
Toronto Dominion Centre, Design Exchange	50
University of Toronto, Harbord	33

Neighborhood	Longitude \
Berczy Park	50
Brockton, Parkdale Village, Exhibition Place	22
Business reply mail Processing Centre, South Ce...	17

CN Tower, King and Spadina, Railway Lands, Harb...	13
Central Bay Street	50
Christie	15
Church and Wellesley	50
Commerce Court, Victoria Hotel	50
Davisville	37
Davisville North	9
Dufferin, Dovercourt Village	16
First Canadian Place, Underground city	50
Forest Hill North & West, Forest Hill Road Park	4
Garden District, Ryerson	50
Harbourfront East, Union Station, Toronto Islands	50
High Park, The Junction South	24
India Bazaar, The Beaches West	19
Kensington Market, Chinatown, Grange Park	50
Lawrence Park	5
Little Portugal, Trinity	41
Moore Park, Summerhill East	3
North Toronto West, Lawrence Park	18
Parkdale, Roncesvalles	14
Queen's Park, Ontario Provincial Government	31
Regent Park, Harbourfront	44
Richmond, Adelaide, King	50
Rosedale	4
Roselawn	1
Runnymede, Swansea	36
St. James Town	50
St. James Town, Cabbagetown	49
Stn A PO Boxes	50
Studio District	37
Summerhill West, Rathnelly, South Hill, Forest ...	13
The Annex, North Midtown, Yorkville	21
The Beaches	4
The Danforth West, Riverdale	42
Toronto Dominion Centre, Design Exchange	50
University of Toronto, Harbord	33

Neighborhood	Venue	Venue Latitude \
Berczy Park	50	50
Brockton, Parkdale Village, Exhibition Place	22	22
Business reply mail Processing Centre, South Ce...	17	17
CN Tower, King and Spadina, Railway Lands, Harb...	13	13
Central Bay Street	50	50
Christie	15	15
Church and Wellesley	50	50
Commerce Court, Victoria Hotel	50	50

Davisville	37	37
Davisville North	9	9
Dufferin, Dovercourt Village	16	16
First Canadian Place, Underground city	50	50
Forest Hill North & West, Forest Hill Road Park	4	4
Garden District, Ryerson	50	50
Harbourfront East, Union Station, Toronto Islands	50	50
High Park, The Junction South	24	24
India Bazaar, The Beaches West	19	19
Kensington Market, Chinatown, Grange Park	50	50
Lawrence Park	5	5
Little Portugal, Trinity	41	41
Moore Park, Summerhill East	3	3
North Toronto West, Lawrence Park	18	18
Parkdale, Roncesvalles	14	14
Queen's Park, Ontario Provincial Government	31	31
Regent Park, Harbourfront	44	44
Richmond, Adelaide, King	50	50
Rosedale	4	4
Roselawn	1	1
Runnymede, Swansea	36	36
St. James Town	50	50
St. James Town, Cabbagetown	49	49
Stn A PO Boxes	50	50
Studio District	37	37
Summerhill West, Rathnelly, South Hill, Forest ...	13	13
The Annex, North Midtown, Yorkville	21	21
The Beaches	4	4
The Danforth West, Riverdale	42	42
Toronto Dominion Centre, Design Exchange	50	50
University of Toronto, Harbord	33	33

Venue Longitude \

Neighborhood	
Berczy Park	50
Brockton, Parkdale Village, Exhibition Place	22
Business reply mail Processing Centre, South Ce...	17
CN Tower, King and Spadina, Railway Lands, Harb...	13
Central Bay Street	50
Christie	15
Church and Wellesley	50
Commerce Court, Victoria Hotel	50
Davisville	37
Davisville North	9
Dufferin, Dovercourt Village	16
First Canadian Place, Underground city	50
Forest Hill North & West, Forest Hill Road Park	4

Garden District, Ryerson	50
Harbourfront East, Union Station, Toronto Islands	50
High Park, The Junction South	24
India Bazaar, The Beaches West	19
Kensington Market, Chinatown, Grange Park	50
Lawrence Park	5
Little Portugal, Trinity	41
Moore Park, Summerhill East	3
North Toronto West, Lawrence Park	18
Parkdale, Roncesvalles	14
Queen's Park, Ontario Provincial Government	31
Regent Park, Harbourfront	44
Richmond, Adelaide, King	50
Rosedale	4
Roselawn	1
Runnymede, Swansea	36
St. James Town	50
St. James Town, Cabbagetown	49
Stn A PO Boxes	50
Studio District	37
Summerhill West, Rathnelly, South Hill, Forest ...	13
The Annex, North Midtown, Yorkville	21
The Beaches	4
The Danforth West, Riverdale	42
Toronto Dominion Centre, Design Exchange	50
University of Toronto, Harbord	33

Venue Category

Neighborhood	
Berczy Park	50
Brockton, Parkdale Village, Exhibition Place	22
Business reply mail Processing Centre, South Ce...	17
CN Tower, King and Spadina, Railway Lands, Harb...	13
Central Bay Street	50
Christie	15
Church and Wellesley	50
Commerce Court, Victoria Hotel	50
Davisville	37
Davisville North	9
Dufferin, Dovercourt Village	16
First Canadian Place, Underground city	50
Forest Hill North & West, Forest Hill Road Park	4
Garden District, Ryerson	50
Harbourfront East, Union Station, Toronto Islands	50
High Park, The Junction South	24
India Bazaar, The Beaches West	19
Kensington Market, Chinatown, Grange Park	50

Lawrence Park	5
Little Portugal, Trinity	41
Moore Park, Summerhill East	3
North Toronto West, Lawrence Park	18
Parkdale, Roncesvalles	14
Queen's Park, Ontario Provincial Government	31
Regent Park, Harbourfront	44
Richmond, Adelaide, King	50
Rosedale	4
Roselawn	1
Runnymede, Swansea	36
St. James Town	50
St. James Town, Cabbagetown	49
Stn A PO Boxes	50
Studio District	37
Summerhill West, Rathnelly, South Hill, Forest ...	13
The Annex, North Midtown, Yorkville	21
The Beaches	4
The Danforth West, Riverdale	42
Toronto Dominion Centre, Design Exchange	50
University of Toronto, Harbord	33

```
[35]: # Vemos cuantas categorias unicas hay por barrio

print('There are {} uniques categories.'.format(len(Toronto_venues['Venue_
↳Category'].unique())))
```

There are 219 uniques categories.

```
[36]: #Analizamos cada barrio

# codificación
Toronto_onehot = pd.get_dummies(Toronto_venues[['Venue Category']], prefix="",
↳prefix_sep="")

# añadir la columna de barrio de regreso al dataframe
Toronto_onehot['Neighborhood'] = Toronto_venues['Neighborhood']

# mover la columna de barrio a la primer columna
fixed_columns = [Toronto_onehot.columns[-1]] + list(Toronto_onehot.columns[:-1])
Toronto_onehot = Toronto_onehot[fixed_columns]

Toronto_onehot.shape
```

```
[36]: (1172, 219)
```

```
[37]: # Agrupamos las filas por barrios tomando el parametro de promedio de
      ↪ocurrencia de cada categoria

Toronto_grouped = Toronto_onehot.groupby('Neighborhood').mean().reset_index()
Toronto_grouped
```

```
[37]:
```

	Neighborhood	Yoga Studio \
0	Berczy Park	0.000000
1	Brockton, Parkdale Village, Exhibition Place	0.000000
2	Business reply mail Processing Centre, South C...	0.058824
3	CN Tower, King and Spadina, Railway Lands, Har...	0.000000
4	Central Bay Street	0.020000
5	Christie	0.000000
6	Church and Wellesley	0.040000
7	Commerce Court, Victoria Hotel	0.000000
8	Davisville	0.000000
9	Davisville North	0.000000
10	Dufferin, Dovercourt Village	0.000000
11	First Canadian Place, Underground city	0.000000
12	Forest Hill North & West, Forest Hill Road Park	0.000000
13	Garden District, Ryerson	0.000000
14	Harbourfront East, Union Station, Toronto Islands	0.000000
15	High Park, The Junction South	0.000000
16	India Bazaar, The Beaches West	0.000000
17	Kensington Market, Chinatown, Grange Park	0.000000
18	Lawrence Park	0.000000
19	Little Portugal, Trinity	0.024390
20	Moore Park, Summerhill East	0.000000
21	North Toronto West, Lawrence Park	0.055556
22	Parkdale, Roncesvalles	0.000000
23	Queen's Park, Ontario Provincial Government	0.032258
24	Regent Park, Harbourfront	0.022727
25	Richmond, Adelaide, King	0.000000
26	Rosedale	0.000000
27	Roselawn	0.000000
28	Runnymede, Swansea	0.027778
29	St. James Town	0.000000
30	St. James Town, Cabbagetown	0.000000
31	Stn A PO Boxes	0.000000
32	Studio District	0.027027
33	Summerhill West, Rathnelly, South Hill, Forest...	0.000000
34	The Annex, North Midtown, Yorkville	0.000000
35	The Beaches	0.000000
36	The Danforth West, Riverdale	0.023810
37	Toronto Dominion Centre, Design Exchange	0.000000
38	University of Toronto, Harbord	0.030303

	Adult Boutique	Airport	Airport Food Court	Airport Gate \
0	0.00	0.000000	0.000000	0.000000
1	0.00	0.000000	0.000000	0.000000
2	0.00	0.000000	0.000000	0.000000
3	0.00	0.076923	0.076923	0.076923
4	0.00	0.000000	0.000000	0.000000
5	0.00	0.000000	0.000000	0.000000
6	0.02	0.000000	0.000000	0.000000
7	0.00	0.000000	0.000000	0.000000
8	0.00	0.000000	0.000000	0.000000
9	0.00	0.000000	0.000000	0.000000
10	0.00	0.000000	0.000000	0.000000
11	0.00	0.000000	0.000000	0.000000
12	0.00	0.000000	0.000000	0.000000
13	0.00	0.000000	0.000000	0.000000
14	0.00	0.000000	0.000000	0.000000
15	0.00	0.000000	0.000000	0.000000
16	0.00	0.000000	0.000000	0.000000
17	0.00	0.000000	0.000000	0.000000
18	0.00	0.000000	0.000000	0.000000
19	0.00	0.000000	0.000000	0.000000
20	0.00	0.000000	0.000000	0.000000
21	0.00	0.000000	0.000000	0.000000
22	0.00	0.000000	0.000000	0.000000
23	0.00	0.000000	0.000000	0.000000
24	0.00	0.000000	0.000000	0.000000
25	0.00	0.000000	0.000000	0.000000
26	0.00	0.000000	0.000000	0.000000
27	0.00	0.000000	0.000000	0.000000
28	0.00	0.000000	0.000000	0.000000
29	0.00	0.000000	0.000000	0.000000
30	0.00	0.000000	0.000000	0.000000
31	0.00	0.000000	0.000000	0.000000
32	0.00	0.000000	0.000000	0.000000
33	0.00	0.000000	0.000000	0.000000
34	0.00	0.000000	0.000000	0.000000
35	0.00	0.000000	0.000000	0.000000
36	0.00	0.000000	0.000000	0.000000
37	0.00	0.000000	0.000000	0.000000
38	0.00	0.000000	0.000000	0.000000

	Airport Lounge	Airport Service	Airport Terminal	American Restaurant \
0	0.000000	0.000000	0.000000	0.000000
1	0.000000	0.000000	0.000000	0.000000
2	0.000000	0.000000	0.000000	0.000000
3	0.153846	0.153846	0.076923	0.000000

4	0.000000	0.000000	0.000000	0.000000
5	0.000000	0.000000	0.000000	0.000000
6	0.000000	0.000000	0.000000	0.000000
7	0.000000	0.000000	0.000000	0.040000
8	0.000000	0.000000	0.000000	0.000000
9	0.000000	0.000000	0.000000	0.000000
10	0.000000	0.000000	0.000000	0.000000
11	0.000000	0.000000	0.000000	0.040000
12	0.000000	0.000000	0.000000	0.000000
13	0.000000	0.000000	0.000000	0.000000
14	0.000000	0.000000	0.000000	0.000000
15	0.000000	0.000000	0.000000	0.000000
16	0.000000	0.000000	0.000000	0.000000
17	0.000000	0.000000	0.000000	0.000000
18	0.000000	0.000000	0.000000	0.000000
19	0.000000	0.000000	0.000000	0.000000
20	0.000000	0.000000	0.000000	0.000000
21	0.000000	0.000000	0.000000	0.000000
22	0.000000	0.000000	0.000000	0.000000
23	0.000000	0.000000	0.000000	0.000000
24	0.000000	0.000000	0.000000	0.000000
25	0.000000	0.000000	0.000000	0.040000
26	0.000000	0.000000	0.000000	0.000000
27	0.000000	0.000000	0.000000	0.000000
28	0.000000	0.000000	0.000000	0.000000
29	0.000000	0.000000	0.000000	0.020000
30	0.000000	0.000000	0.000000	0.000000
31	0.000000	0.000000	0.000000	0.000000
32	0.000000	0.000000	0.000000	0.054054
33	0.000000	0.000000	0.000000	0.076923
34	0.000000	0.000000	0.000000	0.000000
35	0.000000	0.000000	0.000000	0.000000
36	0.000000	0.000000	0.000000	0.023810
37	0.000000	0.000000	0.000000	0.020000
38	0.000000	0.000000	0.000000	0.000000

	...	Theater	Theme Restaurant	Tibetan Restaurant	Toy / Game Store \
0	...	0.000000	0.00	0.000000	0.000000
1	...	0.000000	0.00	0.000000	0.000000
2	...	0.000000	0.00	0.000000	0.000000
3	...	0.000000	0.00	0.000000	0.000000
4	...	0.000000	0.00	0.000000	0.000000
5	...	0.000000	0.00	0.000000	0.000000
6	...	0.000000	0.02	0.000000	0.000000
7	...	0.000000	0.00	0.000000	0.000000
8	...	0.000000	0.00	0.000000	0.027027
9	...	0.000000	0.00	0.000000	0.000000

10	...	0.000000	0.00	0.00000	0.000000
11	...	0.000000	0.00	0.00000	0.000000
12	...	0.000000	0.00	0.00000	0.000000
13	...	0.040000	0.00	0.00000	0.000000
14	...	0.020000	0.00	0.00000	0.000000
15	...	0.000000	0.00	0.00000	0.000000
16	...	0.000000	0.00	0.00000	0.000000
17	...	0.000000	0.00	0.00000	0.000000
18	...	0.000000	0.00	0.00000	0.000000
19	...	0.024390	0.00	0.00000	0.000000
20	...	0.000000	0.00	0.00000	0.000000
21	...	0.000000	0.00	0.00000	0.000000
22	...	0.000000	0.00	0.00000	0.000000
23	...	0.032258	0.00	0.00000	0.000000
24	...	0.045455	0.00	0.00000	0.000000
25	...	0.000000	0.00	0.00000	0.000000
26	...	0.000000	0.00	0.00000	0.000000
27	...	0.000000	0.00	0.00000	0.000000
28	...	0.000000	0.00	0.00000	0.000000
29	...	0.020000	0.00	0.00000	0.000000
30	...	0.000000	0.00	0.00000	0.000000
31	...	0.000000	0.00	0.00000	0.000000
32	...	0.000000	0.00	0.00000	0.000000
33	...	0.000000	0.00	0.00000	0.000000
34	...	0.000000	0.00	0.00000	0.000000
35	...	0.000000	0.00	0.00000	0.000000
36	...	0.000000	0.00	0.02381	0.000000
37	...	0.000000	0.00	0.00000	0.000000
38	...	0.030303	0.00	0.00000	0.000000

	Trail	Train Station	Vegetarian / Vegan Restaurant	Video Game Store \
0	0.00000	0.00	0.020000	0.000000
1	0.00000	0.00	0.000000	0.000000
2	0.00000	0.00	0.000000	0.000000
3	0.00000	0.00	0.000000	0.000000
4	0.00000	0.00	0.020000	0.000000
5	0.00000	0.00	0.000000	0.000000
6	0.00000	0.00	0.000000	0.000000
7	0.00000	0.00	0.020000	0.000000
8	0.00000	0.00	0.000000	0.000000
9	0.00000	0.00	0.000000	0.000000
10	0.00000	0.00	0.000000	0.000000
11	0.00000	0.00	0.020000	0.000000
12	0.25000	0.00	0.000000	0.000000
13	0.00000	0.00	0.000000	0.000000
14	0.00000	0.02	0.000000	0.000000
15	0.00000	0.00	0.000000	0.000000

16	0.00000	0.00	0.000000	0.000000
17	0.00000	0.00	0.060000	0.000000
18	0.00000	0.00	0.000000	0.000000
19	0.00000	0.00	0.024390	0.000000
20	0.00000	0.00	0.000000	0.000000
21	0.00000	0.00	0.000000	0.000000
22	0.00000	0.00	0.000000	0.000000
23	0.00000	0.00	0.032258	0.000000
24	0.00000	0.00	0.000000	0.000000
25	0.00000	0.00	0.020000	0.000000
26	0.25000	0.00	0.000000	0.000000
27	0.00000	0.00	0.000000	0.000000
28	0.00000	0.00	0.027778	0.000000
29	0.00000	0.00	0.020000	0.000000
30	0.00000	0.00	0.000000	0.000000
31	0.00000	0.00	0.020000	0.000000
32	0.00000	0.00	0.000000	0.000000
33	0.00000	0.00	0.000000	0.000000
34	0.00000	0.00	0.000000	0.000000
35	0.25000	0.00	0.000000	0.000000
36	0.02381	0.00	0.000000	0.000000
37	0.00000	0.02	0.020000	0.000000
38	0.00000	0.00	0.000000	0.030303

	Vietnamese Restaurant	Wine Bar
0	0.000000	0.00000
1	0.000000	0.00000
2	0.000000	0.00000
3	0.000000	0.00000
4	0.000000	0.00000
5	0.000000	0.00000
6	0.000000	0.00000
7	0.000000	0.00000
8	0.000000	0.00000
9	0.000000	0.00000
10	0.000000	0.00000
11	0.000000	0.00000
12	0.000000	0.00000
13	0.000000	0.00000
14	0.000000	0.00000
15	0.000000	0.00000
16	0.000000	0.00000
17	0.040000	0.02000
18	0.000000	0.00000
19	0.048780	0.02439
20	0.000000	0.00000
21	0.000000	0.00000

22	0.000000	0.000000
23	0.000000	0.000000
24	0.000000	0.000000
25	0.000000	0.000000
26	0.000000	0.000000
27	0.000000	0.000000
28	0.000000	0.000000
29	0.000000	0.000000
30	0.000000	0.000000
31	0.000000	0.000000
32	0.000000	0.000000
33	0.076923	0.000000
34	0.000000	0.000000
35	0.000000	0.000000
36	0.000000	0.000000
37	0.000000	0.000000
38	0.000000	0.000000

[39 rows x 219 columns]

```
[38]: #Observamos tamaño Dataframe
```

```
Toronto_grouped.shape
```

```
[38]: (39, 219)
```

```
[39]: # Visualizamos cada barrio con los 12 lugares mas comunes
```

```
num_top_venues = 12

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

```
----Berczy Park----
```

	venue	freq
0	Coffee Shop	0.06
1	Beer Bar	0.04
2	Bakery	0.04

3	Restaurant	0.04
4	Cheese Shop	0.04
5	Farmers Market	0.04
6	Seafood Restaurant	0.04
7	Cocktail Bar	0.04
8	Liquor Store	0.02
9	Breakfast Spot	0.02
10	French Restaurant	0.02
11	Café	0.02

----Brockton, Parkdale Village, Exhibition Place----

	venue	freq
0	Café	0.14
1	Coffee Shop	0.09
2	Breakfast Spot	0.09
3	Grocery Store	0.05
4	Furniture / Home Store	0.05
5	Convenience Store	0.05
6	Performing Arts Venue	0.05
7	Gym	0.05
8	Nightclub	0.05
9	Restaurant	0.05
10	Climbing Gym	0.05
11	Burrito Place	0.05

----Business reply mail Processing Centre, South Central Letter Processing Plant
Toronto----

	venue	freq
0	Yoga Studio	0.06
1	Auto Workshop	0.06
2	Comic Shop	0.06
3	Pizza Place	0.06
4	Restaurant	0.06
5	Burrito Place	0.06
6	Skate Park	0.06
7	Brewery	0.06
8	Smoke Shop	0.06
9	Farmers Market	0.06
10	Spa	0.06
11	Light Rail Station	0.06

----CN Tower, King and Spadina, Railway Lands, Harbourfront West, Bathurst Quay,
South Niagara, Island airport----

	venue	freq
0	Airport Lounge	0.15

1	Airport Service	0.15
2	Coffee Shop	0.08
3	Rental Car Location	0.08
4	Airport	0.08
5	Airport Food Court	0.08
6	Airport Gate	0.08
7	Airport Terminal	0.08
8	Harbor / Marina	0.08
9	Sculpture Garden	0.08
10	Boat or Ferry	0.08
11	Moroccan Restaurant	0.00

----Central Bay Street----

	venue	freq
0	Coffee Shop	0.16
1	Café	0.06
2	Sandwich Place	0.06
3	Bubble Tea Shop	0.04
4	Italian Restaurant	0.04
5	Discount Store	0.02
6	Burger Joint	0.02
7	Salad Place	0.02
8	Portuguese Restaurant	0.02
9	Poke Place	0.02
10	Park	0.02
11	Department Store	0.02

----Christie----

	venue	freq
0	Grocery Store	0.27
1	Café	0.20
2	Park	0.13
3	Candy Store	0.07
4	Nightclub	0.07
5	Baby Store	0.07
6	Italian Restaurant	0.07
7	Coffee Shop	0.07
8	Restaurant	0.07
9	Moroccan Restaurant	0.00
10	Monument / Landmark	0.00
11	Yoga Studio	0.00

----Church and Wellesley----

	venue	freq
0	Coffee Shop	0.06

1	Japanese Restaurant	0.04
2	Men's Store	0.04
3	Restaurant	0.04
4	Gay Bar	0.04
5	Yoga Studio	0.04
6	Sushi Restaurant	0.04
7	Sake Bar	0.02
8	Salon / Barbershop	0.02
9	Café	0.02
10	Park	0.02
11	Smoke Shop	0.02

----Commerce Court, Victoria Hotel----

	venue	freq
0	Café	0.10
1	Coffee Shop	0.08
2	Hotel	0.08
3	Restaurant	0.06
4	Seafood Restaurant	0.06
5	Gym	0.06
6	Deli / Bodega	0.04
7	American Restaurant	0.04
8	Bakery	0.04
9	Gastropub	0.04
10	Japanese Restaurant	0.04
11	Salad Place	0.02

----Davisville----

	venue	freq
0	Pizza Place	0.11
1	Dessert Shop	0.08
2	Sandwich Place	0.08
3	Sushi Restaurant	0.05
4	Italian Restaurant	0.05
5	Coffee Shop	0.05
6	Café	0.05
7	Gym	0.05
8	Park	0.03
9	Diner	0.03
10	Seafood Restaurant	0.03
11	Restaurant	0.03

----Davisville North----

	venue	freq
0	Department Store	0.11

1	Park	0.11
2	Sandwich Place	0.11
3	Hotel	0.11
4	Breakfast Spot	0.11
5	Food & Drink Shop	0.11
6	Gym / Fitness Center	0.11
7	Gym	0.11
8	Playground	0.11
9	Mediterranean Restaurant	0.00
10	Monument / Landmark	0.00
11	Mexican Restaurant	0.00

----Dufferin, Dovercourt Village----

	venue	freq
0	Pharmacy	0.12
1	Bakery	0.12
2	Pet Store	0.06
3	Park	0.06
4	Music Venue	0.06
5	Café	0.06
6	Middle Eastern Restaurant	0.06
7	Bus Stop	0.06
8	Brewery	0.06
9	Supermarket	0.06
10	Bar	0.06
11	Bank	0.06

----First Canadian Place, Underground city----

	venue	freq
0	Café	0.12
1	Coffee Shop	0.10
2	Restaurant	0.06
3	Deli / Bodega	0.04
4	Asian Restaurant	0.04
5	Seafood Restaurant	0.04
6	Gym	0.04
7	Japanese Restaurant	0.04
8	Concert Hall	0.04
9	Hotel	0.04
10	American Restaurant	0.04
11	Steakhouse	0.02

----Forest Hill North & West, Forest Hill Road Park----

	venue	freq
0	Trail	0.25

1	Jewelry Store	0.25
2	Mexican Restaurant	0.25
3	Sushi Restaurant	0.25
4	Yoga Studio	0.00
5	Molecular Gastronomy Restaurant	0.00
6	Lounge	0.00
7	Malay Restaurant	0.00
8	Market	0.00
9	Martial Arts School	0.00
10	Mediterranean Restaurant	0.00
11	Men's Store	0.00

----Garden District, Ryerson----

	venue	freq
0	Coffee Shop	0.08
1	Café	0.06
2	Clothing Store	0.04
3	Bookstore	0.04
4	Cosmetics Shop	0.04
5	Ramen Restaurant	0.04
6	Theater	0.04
7	Fast Food Restaurant	0.04
8	Diner	0.02
9	Burrito Place	0.02
10	Shopping Mall	0.02
11	Mexican Restaurant	0.02

----Harbourfront East, Union Station, Toronto Islands----

	venue	freq
0	Aquarium	0.06
1	Scenic Lookout	0.04
2	Hotel	0.04
3	Pizza Place	0.04
4	Plaza	0.04
5	Park	0.04
6	Café	0.04
7	Coffee Shop	0.04
8	Lounge	0.02
9	Sporting Goods Shop	0.02
10	Fried Chicken Joint	0.02
11	Brewery	0.02

----High Park, The Junction South----

	venue	freq
0	Café	0.08

1	Mexican Restaurant	0.08
2	Thai Restaurant	0.08
3	Speakeasy	0.04
4	Italian Restaurant	0.04
5	Flea Market	0.04
6	Cajun / Creole Restaurant	0.04
7	Bookstore	0.04
8	Fried Chicken Joint	0.04
9	Furniture / Home Store	0.04
10	Bar	0.04
11	Bakery	0.04

----India Bazaar, The Beaches West----

	venue	freq
0	Liquor Store	0.05
1	Sandwich Place	0.05
2	Food & Drink Shop	0.05
3	Fish & Chips Shop	0.05
4	Steakhouse	0.05
5	Restaurant	0.05
6	Sushi Restaurant	0.05
7	Burrito Place	0.05
8	Movie Theater	0.05
9	Italian Restaurant	0.05
10	Intersection	0.05
11	Pub	0.05

----Kensington Market, Chinatown, Grange Park----

	venue	freq
0	Café	0.10
1	Vegetarian / Vegan Restaurant	0.06
2	Bar	0.06
3	Caribbean Restaurant	0.04
4	Vietnamese Restaurant	0.04
5	Burger Joint	0.04
6	Mexican Restaurant	0.04
7	Bakery	0.04
8	Coffee Shop	0.04
9	Wine Bar	0.02
10	Dessert Shop	0.02
11	Food Court	0.02

----Lawrence Park----

	venue	freq
0	Dim Sum Restaurant	0.2

1	Park	0.2
2	Lake	0.2
3	Bus Line	0.2
4	Swim School	0.2
5	Monument / Landmark	0.0
6	Market	0.0
7	Martial Arts School	0.0
8	Mediterranean Restaurant	0.0
9	Men's Store	0.0
10	Mexican Restaurant	0.0
11	Middle Eastern Restaurant	0.0

----Little Portugal, Trinity----

	venue	freq
0	Bar	0.12
1	Asian Restaurant	0.05
2	Vietnamese Restaurant	0.05
3	Café	0.05
4	Restaurant	0.05
5	Men's Store	0.05
6	Italian Restaurant	0.02
7	Cocktail Bar	0.02
8	Coffee Shop	0.02
9	Cuban Restaurant	0.02
10	Cupcake Shop	0.02
11	Diner	0.02

----Moore Park, Summerhill East----

	venue	freq
0	Lawyer	0.33
1	Park	0.33
2	Tennis Court	0.33
3	Monument / Landmark	0.00
4	Lounge	0.00
5	Malay Restaurant	0.00
6	Market	0.00
7	Martial Arts School	0.00
8	Mediterranean Restaurant	0.00
9	Men's Store	0.00
10	Mexican Restaurant	0.00
11	Middle Eastern Restaurant	0.00

----North Toronto West, Lawrence Park----

	venue	freq
0	Coffee Shop	0.11

1	Clothing Store	0.11
2	Yoga Studio	0.06
3	Bagel Shop	0.06
4	Sporting Goods Shop	0.06
5	Spa	0.06
6	Salon / Barbershop	0.06
7	Restaurant	0.06
8	Pet Store	0.06
9	Park	0.06
10	Mexican Restaurant	0.06
11	Fast Food Restaurant	0.06

----Parkdale, Roncesvalles----

	venue	freq
0	Gift Shop	0.14
1	Breakfast Spot	0.14
2	Dessert Shop	0.07
3	Eastern European Restaurant	0.07
4	Bar	0.07
5	Dog Run	0.07
6	Movie Theater	0.07
7	Italian Restaurant	0.07
8	Restaurant	0.07
9	Bookstore	0.07
10	Coffee Shop	0.07
11	Cuban Restaurant	0.07

----Queen's Park, Ontario Provincial Government----

	venue	freq
0	Coffee Shop	0.19
1	Sushi Restaurant	0.06
2	Yoga Studio	0.03
3	College Auditorium	0.03
4	Spa	0.03
5	Smoothie Shop	0.03
6	Burrito Place	0.03
7	Café	0.03
8	Sandwich Place	0.03
9	Restaurant	0.03
10	Creperie	0.03
11	Bar	0.03

----Regent Park, Harbourfront----

	venue	freq
0	Coffee Shop	0.16

1	Park	0.07
2	Bakery	0.07
3	Pub	0.07
4	Theater	0.05
5	Café	0.05
6	Breakfast Spot	0.05
7	Electronics Store	0.02
8	Restaurant	0.02
9	Spa	0.02
10	Gym / Fitness Center	0.02
11	Shoe Store	0.02

----Richmond, Adelaide, King----

	venue	freq
0	Coffee Shop	0.10
1	Café	0.08
2	Steakhouse	0.04
3	Pizza Place	0.04
4	Concert Hall	0.04
5	Restaurant	0.04
6	American Restaurant	0.04
7	Thai Restaurant	0.04
8	Juice Bar	0.02
9	Colombian Restaurant	0.02
10	Speakeasy	0.02
11	Bookstore	0.02

----Rosedale----

	venue	freq
0	Park	0.50
1	Playground	0.25
2	Trail	0.25
3	Yoga Studio	0.00
4	Molecular Gastronomy Restaurant	0.00
5	Lounge	0.00
6	Malay Restaurant	0.00
7	Market	0.00
8	Martial Arts School	0.00
9	Mediterranean Restaurant	0.00
10	Men's Store	0.00
11	Mexican Restaurant	0.00

----Roselawn----

	venue	freq
0	Garden	1.0

1	Yoga Studio	0.0
2	Moroccan Restaurant	0.0
3	Malay Restaurant	0.0
4	Market	0.0
5	Martial Arts School	0.0
6	Mediterranean Restaurant	0.0
7	Men's Store	0.0
8	Mexican Restaurant	0.0
9	Middle Eastern Restaurant	0.0
10	Miscellaneous Shop	0.0
11	Modern European Restaurant	0.0

----Runnymede, Swansea----

	venue	freq
0	Café	0.08
1	Sushi Restaurant	0.08
2	Coffee Shop	0.08
3	Pizza Place	0.06
4	Pub	0.06
5	Italian Restaurant	0.06
6	Burrito Place	0.03
7	French Restaurant	0.03
8	Bookstore	0.03
9	South American Restaurant	0.03
10	Smoothie Shop	0.03
11	Yoga Studio	0.03

----St. James Town----

	venue	freq
0	Café	0.10
1	Cosmetics Shop	0.06
2	Gastropub	0.06
3	Coffee Shop	0.06
4	Seafood Restaurant	0.04
5	Park	0.04
6	Bakery	0.04
7	Farmers Market	0.04
8	Creperie	0.04
9	Bookstore	0.02
10	Beer Bar	0.02
11	New American Restaurant	0.02

----St. James Town, Cabbagetown----

	venue	freq
0	Coffee Shop	0.10

1	Pizza Place	0.06
2	Pet Store	0.04
3	Bakery	0.04
4	Café	0.04
5	Pub	0.04
6	Restaurant	0.04
7	Italian Restaurant	0.04
8	Chinese Restaurant	0.02
9	Liquor Store	0.02
10	Snack Place	0.02
11	Diner	0.02

----Stn A PO Boxes----

	venue	freq
0	Café	0.06
1	Cheese Shop	0.04
2	Creperie	0.04
3	Seafood Restaurant	0.04
4	Beer Bar	0.04
5	Bakery	0.04
6	Farmers Market	0.04
7	Cocktail Bar	0.04
8	Coffee Shop	0.04
9	Japanese Restaurant	0.04
10	Pub	0.04
11	Restaurant	0.04

----Studio District----

	venue	freq
0	Coffee Shop	0.08
1	Brewery	0.05
2	Bakery	0.05
3	Gastropub	0.05
4	American Restaurant	0.05
5	Café	0.05
6	Seafood Restaurant	0.03
7	Bookstore	0.03
8	Food & Drink Shop	0.03
9	Fish Market	0.03
10	Middle Eastern Restaurant	0.03
11	Clothing Store	0.03

----Summerhill West, Rathnelly, South Hill, Forest Hill SE, Deer Park----

	venue	freq
0	Coffee Shop	0.15

1	Fried Chicken Joint	0.08
2	American Restaurant	0.08
3	Sushi Restaurant	0.08
4	Restaurant	0.08
5	Pub	0.08
6	Supermarket	0.08
7	Bank	0.08
8	Light Rail Station	0.08
9	Pizza Place	0.08
10	Liquor Store	0.08
11	Vietnamese Restaurant	0.08

----The Annex, North Midtown, Yorkville----

	venue	freq
0	Coffee Shop	0.14
1	Café	0.14
2	Sandwich Place	0.14
3	Pharmacy	0.05
4	Burger Joint	0.05
5	Middle Eastern Restaurant	0.05
6	Liquor Store	0.05
7	Donut Shop	0.05
8	Flower Shop	0.05
9	Indian Restaurant	0.05
10	BBQ Joint	0.05
11	Pizza Place	0.05

----The Beaches----

	venue	freq
0	Trail	0.25
1	Pub	0.25
2	Health Food Store	0.25
3	Yoga Studio	0.00
4	Monument / Landmark	0.00
5	Malay Restaurant	0.00
6	Market	0.00
7	Martial Arts School	0.00
8	Mediterranean Restaurant	0.00
9	Men's Store	0.00
10	Mexican Restaurant	0.00
11	Middle Eastern Restaurant	0.00

----The Danforth West, Riverdale----

	venue	freq
0	Greek Restaurant	0.17

1	Coffee Shop	0.10
2	Italian Restaurant	0.07
3	Furniture / Home Store	0.05
4	Ice Cream Shop	0.05
5	Lounge	0.02
6	Fruit & Vegetable Store	0.02
7	Frozen Yogurt Shop	0.02
8	Spa	0.02
9	Bookstore	0.02
10	Liquor Store	0.02
11	Bubble Tea Shop	0.02

----Toronto Dominion Centre, Design Exchange----

	venue	freq
0	Café	0.12
1	Coffee Shop	0.12
2	Hotel	0.06
3	Restaurant	0.06
4	Seafood Restaurant	0.06
5	Gastropub	0.04
6	Bakery	0.04
7	Japanese Restaurant	0.04
8	French Restaurant	0.02
9	Speakeasy	0.02
10	Museum	0.02
11	Steakhouse	0.02

----University of Toronto, Harbord----

	venue	freq
0	Café	0.15
1	Bakery	0.06
2	Bar	0.06
3	Japanese Restaurant	0.06
4	Bookstore	0.06
5	Sandwich Place	0.06
6	College Arts Building	0.03
7	Beer Bar	0.03
8	Beer Store	0.03
9	Restaurant	0.03
10	Yoga Studio	0.03
11	Bank	0.03


```
[40]: # Creamos una funcion para ordenar en forma descendente los lugares
```

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

    return row_categories_sorted.index.values[0:num_top_venues]
```

```
[41]: # mostramos los primeros 12 lugares de cada barrio en un Dataframe nuevo
```

```
num_top_venues = 12

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

# crear las columnas acorde al numero de sitios populares
columns = ['Neighborhood']
for ind in np.arange(num_top_venues):
    try:
        columns.append('{}-{} Most Common Venue'.format(ind+1, indicators[ind]))
    except:
        columns.append('{}th Most Common Venue'.format(ind+1))

# crear un nuevo dataframe
neighborhoods_venues_sorted = pd.DataFrame(columns=columns)
neighborhoods_venues_sorted['Neighborhood'] = Toronto_grouped['Neighborhood']

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

neighborhoods_venues_sorted.head()
```

```
[41]:
```

	Neighborhood	1st Most Common Venue	\
0	Berczy Park	Coffee Shop	
1	Brockton, Parkdale Village, Exhibition Place	Café	
2	Business reply mail Processing Centre, South C...	Yoga Studio	
3	CN Tower, King and Spadina, Railway Lands, Har...	Airport Lounge	
4	Central Bay Street	Coffee Shop	

	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	\
0	Seafood Restaurant	Beer Bar	Bakery	
1	Breakfast Spot	Coffee Shop	Climbing Gym	
2	Auto Workshop	Park	Comic Shop	
3	Airport Service	Boat or Ferry	Sculpture Garden	
4	Sandwich Place	Café	Bubble Tea Shop	

	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	\
--	-----------------------	-----------------------	-----------------------	---

0	Cocktail Bar	Farmers Market	Cheese Shop
1	Burrito Place	Nightclub	Italian Restaurant
2	Pizza Place	Restaurant	Burrito Place
3	Airport	Airport Food Court	Airport Gate
4	Italian Restaurant	Comic Shop	Salad Place

	8th Most Common Venue	9th Most Common Venue	10th Most Common Venue \
0	Restaurant	Jazz Club	Hotel
1	Intersection	Restaurant	Bar
2	Brewery	Light Rail Station	Skate Park
3	Airport Terminal	Rental Car Location	Coffee Shop
4	Burger Joint	Portuguese Restaurant	Poke Place

	11th Most Common Venue	12th Most Common Venue
0	Bistro	Concert Hall
1	Stadium	Bakery
2	Spa	Farmers Market
3	Harbor / Marina	Dog Run
4	Park	New American Restaurant

```
[42]: # establecer el número de agrupaciones en 5
kclusters = 5

Toronto_grouped_clustering = Toronto_grouped.drop('Neighborhood', 1)

# ejecutar k-means
kmeans = KMeans(n_clusters=kclusters, random_state=0).
    ↪fit(Toronto_grouped_clustering)

# revisar las etiquetas de las agrupaciones generadas para cada fila del
    ↪dataframe
kmeans.labels_[0:5]
```

```
[42]: array([0, 0, 0, 0, 0], dtype=int32)
```

```
[43]: # añadir etiquetas
neighborhoods_venues_sorted.insert(0, 'Cluster Labels', kmeans.labels_)

Toronto_merged = Tor_d

# juntar Toronto_grouped con Toronto_data
Toronto_merged = Toronto_merged.join(neighborhoods_venues_sorted.
    ↪set_index('Neighborhood'), on='Neighborhood')
Toronto_merged['Cluster Labels'] = Toronto_merged['Cluster Labels'].fillna("0").
    ↪astype(int)
```

```
Toronto_merged.head() # revisar las ultimas columnas
```

```
[43]:
```

	Postal Code	Borough	Neighborhood \
0	M5A	Downtown Toronto	Regent Park, Harbourfront
1	M7A	Downtown Toronto	Queen's Park, Ontario Provincial Government
2	M5B	Downtown Toronto	Garden District, Ryerson
3	M5C	Downtown Toronto	St. James Town
4	M4E	East Toronto	The Beaches

	Latitude	Longitude	Cluster Labels	1st Most Common Venue \
0	43.654260	-79.360636	0	Coffee Shop
1	43.662301	-79.389494	0	Coffee Shop
2	43.657162	-79.378937	0	Coffee Shop
3	43.651494	-79.375418	0	Café
4	43.676357	-79.293031	0	Trail

	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue \
0	Park	Bakery	Pub
1	Sushi Restaurant	Yoga Studio	Bank
2	Café	Clothing Store	Ramen Restaurant
3	Cosmetics Shop	Gastropub	Coffee Shop
4	Pub	Health Food Store	Wine Bar

	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue \
0	Breakfast Spot	Café	Theater
1	Spa	Smoothie Shop	Beer Bar
2	Fast Food Restaurant	Cosmetics Shop	Bookstore
3	Creperie	Bakery	Park
4	Dance Studio	Dumpling Restaurant	Donut Shop

	8th Most Common Venue	9th Most Common Venue	10th Most Common Venue \
0	Cosmetics Shop	Shoe Store	Restaurant
1	Sandwich Place	Restaurant	Burrito Place
2	Theater	Pizza Place	Electronics Store
3	Seafood Restaurant	Farmers Market	Electronics Store
4	Doner Restaurant	Dog Run	Distribution Center

	11th Most Common Venue	12th Most Common Venue
0	Chocolate Shop	Performing Arts Venue
1	Café	College Auditorium
2	Bakery	Shopping Mall
3	Cocktail Bar	Bookstore
4	Discount Store	Diner

```
[44]: # creamos mapa de agrupacion
map_clusters = folium.Map(location=[latitude, longitude], zoom_start=11)
```

```

# establecer el esquema de color para las agrupaciones
x = np.arange(kclusters)
ys = [i + x + (i*x)**2 for i in range(kclusters)]
colors_array = cm.rainbow(np.linspace(0, 1, len(ys)))
rainbow = [colors.rgb2hex(i) for i in colors_array]

# añadir marcadores al mapa
markers_colors = []
for lat, lon, poi, cluster in zip(Toronto_merged['Latitude'],
    ↪Toronto_merged['Longitude'], Toronto_merged['Neighborhood'],
    ↪Toronto_merged['Cluster Labels']):
    label = folium.Popup(str(poi) + ' Cluster ' + str(cluster), parse_html=True)
    folium.CircleMarker(
        [lat, lon],
        radius=5,
        popup=label,
        color=rainbow[cluster-1],
        fill=True,
        fill_color=rainbow[cluster-1],
        fill_opacity=0.7).add_to(map_clusters)

map_clusters

```

[44]: <folium.folium.Map at 0x7fd9c45f0668>

[45]: # Examinamos las agrupaciones pudiendo observar que categorías distinguen a
 ↪cada agrupación

[46]: Toronto_merged.loc[Toronto_merged['Cluster Labels'] == 0, Toronto_merged.
 ↪columns[[2] + list(range(5, Toronto_merged.shape[1]))]]

[46]:	Neighborhood	Cluster Labels \
0	Regent Park, Harbourfront	0
1	Queen's Park, Ontario Provincial Government	0
2	Garden District, Ryerson	0
3	St. James Town	0
4	The Beaches	0
5	Berczy Park	0
6	Central Bay Street	0
7	Christie	0
8	Richmond, Adelaide, King	0
9	Dufferin, Dovercourt Village	0
10	Harbourfront East, Union Station, Toronto Islands	0
11	Little Portugal, Trinity	0
12	The Danforth West, Riverdale	0
13	Toronto Dominion Centre, Design Exchange	0
14	Brockton, Parkdale Village, Exhibition Place	0

15	India Bazaar, The Beaches West	0
16	Commerce Court, Victoria Hotel	0
17	Studio District	0
18	Lawrence Park	0
20	Davisville North	0
22	High Park, The Junction South	0
23	North Toronto West, Lawrence Park	0
24	The Annex, North Midtown, Yorkville	0
25	Parkdale, Roncesvalles	0
26	Davisville	0
27	University of Toronto, Harbord	0
28	Runnymede, Swansea	0
30	Kensington Market, Chinatown, Grange Park	0
31	Summerhill West, Rathnelly, South Hill, Forest...	0
32	CN Tower, King and Spadina, Railway Lands, Har...	0
34	Stn A PO Boxes	0
35	St. James Town, Cabbagetown	0
36	First Canadian Place, Underground city	0
37	Church and Wellesley	0
38	Business reply mail Processing Centre, South C...	0

	1st Most Common Venue	2nd Most Common Venue \
0	Coffee Shop	Park
1	Coffee Shop	Sushi Restaurant
2	Coffee Shop	Café
3	Café	Cosmetics Shop
4	Trail	Pub
5	Coffee Shop	Seafood Restaurant
6	Coffee Shop	Sandwich Place
7	Grocery Store	Café
8	Coffee Shop	Café
9	Bakery	Pharmacy
10	Aquarium	Scenic Lookout
11	Bar	Café
12	Greek Restaurant	Coffee Shop
13	Coffee Shop	Café
14	Café	Breakfast Spot
15	Fast Food Restaurant	Ice Cream Shop
16	Café	Hotel
17	Coffee Shop	Gastropub
18	Park	Lake
20	Park	Playground
22	Mexican Restaurant	Café
23	Coffee Shop	Clothing Store
24	Coffee Shop	Café
25	Breakfast Spot	Gift Shop
26	Pizza Place	Sandwich Place

27	Café	Bakery
28	Coffee Shop	Sushi Restaurant
30	Café	Vegetarian / Vegan Restaurant
31	Coffee Shop	Pub
32	Airport Lounge	Airport Service
34	Café	Cocktail Bar
35	Coffee Shop	Pizza Place
36	Café	Coffee Shop
37	Coffee Shop	Yoga Studio
38	Yoga Studio	Auto Workshop

	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue \
0	Bakery	Pub	Breakfast Spot
1	Yoga Studio	Bank	Spa
2	Clothing Store	Ramen Restaurant	Fast Food Restaurant
3	Gastropub	Coffee Shop	Creperie
4	Health Food Store	Wine Bar	Dance Studio
5	Beer Bar	Bakery	Cocktail Bar
6	Café	Bubble Tea Shop	Italian Restaurant
7	Park	Candy Store	Italian Restaurant
8	American Restaurant	Restaurant	Steakhouse
9	Brewery	Supermarket	Bar
10	Park	Hotel	Plaza
11	Vietnamese Restaurant	Asian Restaurant	Restaurant
12	Italian Restaurant	Furniture / Home Store	Ice Cream Shop
13	Restaurant	Hotel	Seafood Restaurant
14	Coffee Shop	Climbing Gym	Burrito Place
15	Steakhouse	Brewery	Sushi Restaurant
16	Coffee Shop	Restaurant	Seafood Restaurant
17	Bakery	Brewery	Café
18	Dim Sum Restaurant	Bus Line	Swim School
20	Hotel	Department Store	Gym / Fitness Center
22	Thai Restaurant	Bookstore	Discount Store
23	Yoga Studio	Fast Food Restaurant	Bagel Shop
24	Sandwich Place	History Museum	Park
25	Eastern European Restaurant	Movie Theater	Restaurant
26	Dessert Shop	Gym	Coffee Shop
27	Bar	Bookstore	Sandwich Place
28	Café	Pizza Place	Pub
30	Bar	Burger Joint	Caribbean Restaurant
31	Pizza Place	Supermarket	Sushi Restaurant
32	Boat or Ferry	Sculpture Garden	Airport
34	Cheese Shop	Farmers Market	Bakery
35	Bakery	Restaurant	Pub
36	Restaurant	American Restaurant	Deli / Bodega
37	Men's Store	Japanese Restaurant	Gay Bar
38	Park	Comic Shop	Pizza Place

	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue \
0	Café	Theater	Cosmetics Shop
1	Smoothie Shop	Beer Bar	Sandwich Place
2	Cosmetics Shop	Bookstore	Theater
3	Bakery	Park	Seafood Restaurant
4	Dumpling Restaurant	Donut Shop	Doner Restaurant
5	Farmers Market	Cheese Shop	Restaurant
6	Comic Shop	Salad Place	Burger Joint
7	Baby Store	Restaurant	Coffee Shop
8	Concert Hall	Thai Restaurant	Pizza Place
9	Middle Eastern Restaurant	Café	Bus Stop
10	Pizza Place	Café	Coffee Shop
11	Men's Store	Korean Restaurant	Italian Restaurant
12	Cosmetics Shop	Brewery	Bubble Tea Shop
13	Japanese Restaurant	Gastropub	Bakery
14	Nightclub	Italian Restaurant	Intersection
15	Intersection	Fish & Chips Shop	Italian Restaurant
16	Gym	Deli / Bodega	Japanese Restaurant
17	American Restaurant	Yoga Studio	Coworking Space
18	Department Store	Dumpling Restaurant	Donut Shop
20	Sandwich Place	Gym	Breakfast Spot
22	Bar	Bakery	Flea Market
23	Café	Mexican Restaurant	Sporting Goods Shop
24	Pharmacy	Pizza Place	Pub
25	Bookstore	Italian Restaurant	Bar
26	Italian Restaurant	Café	Sushi Restaurant
27	Japanese Restaurant	Dessert Shop	Poutine Place
28	Italian Restaurant	Yoga Studio	Bookstore
30	Bakery	Mexican Restaurant	Coffee Shop
31	Restaurant	Bank	American Restaurant
32	Airport Food Court	Airport Gate	Airport Terminal
34	Beer Bar	Seafood Restaurant	Japanese Restaurant
35	Italian Restaurant	Café	Pet Store
36	Concert Hall	Japanese Restaurant	Asian Restaurant
37	Sushi Restaurant	Restaurant	Bubble Tea Shop
38	Restaurant	Burrito Place	Brewery
	9th Most Common Venue	10th Most Common Venue \	
0	Shoe Store	Restaurant	
1	Restaurant	Burrito Place	
2	Pizza Place	Electronics Store	
3	Farmers Market	Electronics Store	
4	Dog Run	Distribution Center	
5	Jazz Club	Hotel	
6	Portuguese Restaurant	Poke Place	
7	Nightclub	Distribution Center	

8	Department Store	Speakeasy
9	Gym / Fitness Center	Bank
10	Dessert Shop	Bistro
11	Japanese Restaurant	Juice Bar
12	Restaurant	Café
13	Sandwich Place	Gym
14	Restaurant	Bar
15	Gym	Restaurant
16	Gastropub	Bakery
17	Cheese Shop	Clothing Store
18	Doner Restaurant	Dog Run
20	Food & Drink Shop	Discount Store
22	Italian Restaurant	Cajun / Creole Restaurant
23	Spa	Chinese Restaurant
24	Middle Eastern Restaurant	Burger Joint
25	Cuban Restaurant	Dessert Shop
26	Diner	Seafood Restaurant
27	Pub	College Arts Building
28	Bar	South American Restaurant
30	Vietnamese Restaurant	Fish Market
31	Fried Chicken Joint	Liquor Store
32	Rental Car Location	Coffee Shop
34	Restaurant	Pub
35	Beer Store	Bank
36	Seafood Restaurant	Gym
37	Burrito Place	Burger Joint
38	Light Rail Station	Skate Park

	11th Most Common Venue	12th Most Common Venue
0	Chocolate Shop	Performing Arts Venue
1	Café	College Auditorium
2	Bakery	Shopping Mall
3	Cocktail Bar	Bookstore
4	Discount Store	Diner
5	Bistro	Concert Hall
6	Park	New American Restaurant
7	Diner	Dim Sum Restaurant
8	Gym / Fitness Center	Smoke Shop
9	Grocery Store	Pet Store
10	History Museum	Salad Place
11	Wine Bar	Malay Restaurant
12	Pub	Caribbean Restaurant
13	Salad Place	Pub
14	Stadium	Bakery
15	Pizza Place	Food & Drink Shop
16	American Restaurant	Sandwich Place
17	Pet Store	Comfort Food Restaurant

18	Distribution Center	Discount Store
20	Distribution Center	Dance Studio
22	Arts & Crafts Store	Diner
23	Salon / Barbershop	Pet Store
24	Liquor Store	Indian Restaurant
25	Dog Run	Coffee Shop
26	Restaurant	Japanese Restaurant
27	Restaurant	Noodle House
28	Smoothie Shop	Indie Movie Theater
30	Filipino Restaurant	Record Shop
31	Light Rail Station	Vietnamese Restaurant
32	Harbor / Marina	Dog Run
34	Coffee Shop	Creperie
35	Bar	Park
36	Hotel	Speakeasy
37	Salon / Barbershop	Sake Bar
38	Spa	Farmers Market

```
[47]: Toronto_merged.loc[Toronto_merged['Cluster Labels'] == 1, Toronto_merged.
      ↪columns[[2] + list(range(5, Toronto_merged.shape[1]))]]
```

```
[47]: Neighborhood Cluster Labels 1st Most Common Venue 2nd Most Common Venue \
33 Rosedale 1 Park Playground

      3rd Most Common Venue 4th Most Common Venue 5th Most Common Venue \
33 Trail Cupcake Shop Donut Shop

      6th Most Common Venue 7th Most Common Venue 8th Most Common Venue \
33 Doner Restaurant Dog Run Distribution Center

      9th Most Common Venue 10th Most Common Venue 11th Most Common Venue \
33 Discount Store Diner Dim Sum Restaurant

      12th Most Common Venue
33 Dessert Shop
```

```
[48]: Toronto_merged.loc[Toronto_merged['Cluster Labels'] == 2, Toronto_merged.
      ↪columns[[2] + list(range(5, Toronto_merged.shape[1]))]]
```

```
[48]: Neighborhood Cluster Labels 1st Most Common Venue \
29 Moore Park, Summerhill East 2 Park

      2nd Most Common Venue 3rd Most Common Venue 4th Most Common Venue \
29 Tennis Court Lawyer Colombian Restaurant

      5th Most Common Venue 6th Most Common Venue 7th Most Common Venue \
29 Department Store Eastern European Restaurant Dumpling Restaurant
```

	8th Most Common Venue	9th Most Common Venue	10th Most Common Venue	\
29	Donut Shop	Doner Restaurant	Dog Run	

	11th Most Common Venue	12th Most Common Venue
29	Distribution Center	Discount Store

```
[49]: Toronto_merged.loc[Toronto_merged['Cluster Labels'] == 3, Toronto_merged.
      ↪columns[[2] + list(range(5, Toronto_merged.shape[1]))]]
```

	Neighborhood	Cluster Labels	1st Most Common Venue	2nd Most Common Venue	\
19	Roselawn	3	Garden	Wine Bar	

	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	\
19	Deli / Bodega	Eastern European Restaurant	Dumpling Restaurant	

	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue	\
19	Donut Shop	Doner Restaurant	Dog Run	

	9th Most Common Venue	10th Most Common Venue	11th Most Common Venue	\
19	Distribution Center	Discount Store	Diner	

	12th Most Common Venue
19	Dim Sum Restaurant

```
[50]: Toronto_merged.loc[Toronto_merged['Cluster Labels'] == 4, Toronto_merged.
      ↪columns[[2] + list(range(5, Toronto_merged.shape[1]))]]
```

	Neighborhood	Cluster Labels	\
21	Forest Hill North & West, Forest Hill Road Park	4	

	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	\
21	Jewelry Store	Trail	Mexican Restaurant	

	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	\
21	Sushi Restaurant	Wine Bar	Department Store	

	7th Most Common Venue	8th Most Common Venue	9th Most Common Venue	\
21	Dumpling Restaurant	Donut Shop	Doner Restaurant	

	10th Most Common Venue	11th Most Common Venue	12th Most Common Venue
21	Dog Run	Distribution Center	Discount Store

```
[51]: !jupyter nbconvert --to html TorontoFinal3.ipynb
```

```
[NbConvertApp] Converting notebook TorontoFinal3.ipynb to html
[NbConvertApp] Writing 726390 bytes to TorontoFinal3.html
```