# 1.    INTRODUCTION

A major coffee shop chain ("Company"), which is currently operating in Greece has been partially acquired (80% of the shares) from a Canadian Group ("Group"). The coffee shop chain has more than 100 shops operating successfully in Greece. According to information provided by the Company, key factor for the success of its retail shops, is the "ideal" location selection of its shops.

One of its most profitable coffee shop (highest sales, gross profit and net profit margins) is operating in the Neighbourhood of Kolonaki in the centre of Athens.

The Group is considering starting to expand its businesses abroad. In specific the management of the Group is considering opening coffee shops in USA & Canada. For that purpose, they need to commit and "risk" substantial capital expenditures and opex.

Before starting to commit any funds for expanding its businesses abroad, the management of the Group has decided to start with a "pilot project" (opening only one shop in one country).

The main purpose of the pilot project is to figure out if the successful "Greek coffee shop model" could be replicated in Canada and the USA, without any major adjustments on the marketing "mix" & policy or alternatively if the existing business & marketing model must be adjusted substantially in order to penetrate the foreign markets.

As a first step the Group has decided that it will be more efficient to start with Canada/Toronto since the Group is based in Canada and it has sufficient local know how & it would be more cost effective to start the "pilot project" in Canada instead of USA .

The second Step is to identify the characteristics/venue categories of the Greek Neighbourhood , where the Company's existing most successful shop is located, i.e Kolonaki, Greece.

The next step is to identify one or several Boroughs/Neighbourhoods of Toronto Centre, with similar venue categories & characteristics to Kolonaki Athens. By identifying the common venues of Kolonaki-Athens and Toronto Centre, the Company will be able to open a shop in Toronto, which has similar venues categories to Athens Centre.

For preparing the above the Company will use the services of a Data scientist.

After the Data scientist suggest to the Company the relevant Boroughs/Neighbourhoods of Toronto Centre, which are similar to Kolonaki Athens, the Company will use its own additional  "selection criteria ", which are currently not disclosed to the Data scientist, in order to select the final Borough/Neighbourhood , where the new coffee shop will operate.

Identifying the Neighbourhoods of Toronto Central which share similar characteristics to Athens,  is critical for the following indicative reasons :

1.  Company success is strongly correlated with proper "location selection"
2.  In case of failure of the "new " Toronto coffee shop to achieve sales target, such failure will not primarily be attributed to "wrong" location selection, since both Athens shop and Canadian shop will have similar venue categories. Indicatively the Company may attribute a potential failure to "price policy" of the new shop or "low acceptance" of the Toronto retail clients for the specific coffee taste or  ineffective business promotion, or lack of brand awareness  etc.

Depending on the success or not of the new pilot shop the Company will decide if expansion with the existing business model is making economic sense or if further adjustments of the business model are necessary.

For executing the above steps the Company is asking for the professional services of a Data Scientist

The data scientist has decided to utilize Foursquare in order to explore the venue categories near the Athens shop. Then the Data scientist will use public available information from several sources (see next section ) in order to find the Boroughs and Neighbourhoods in Toronto Center.

In addition the Data scientist will utilize again Foursquare in order to find venue categories for each Borough and Neighbourhood in Toronto centre.

Finally he/she will create a cluster ( using KMeans from sklearn cluster) of Boroughs and Neighbourhoods in Toronto, which share similar venue categories to Athens Greece and he/she will deliver the findings of his/her work to the management of the Company.

## 2.    DATA (Source)

For the specific project assigned by the Group we need the following data:

- Coordinates of the existing location in Kolonaki Athens and Coordinates of Toronto Centre. In that respect we will use from "geopy.geocoders" , "Nominatim", which converts an address into latitude and longitude values :

```
# Lets now find the coordinates of Clients existing business in Athens, Patriarchou Ioakim street.

address = 'patriarchou ioakim , Athens'
geolocator = Nominatim()
location = geolocator.geocode(address)
kolonaki_latitude = location.latitude
kolonaki_longitude = location.longitude
print('The geograpical coordinate of {}  Athens-Kolonaki  home are {}, {}.'.format(address, kolonaki_latitude, kolonaki_longitud
print('The exact location of our address is :  {}.'.format(location))
```

- Venues for Kolonaki neighbourhood in Athens and for Toronto centre near our targeted Borough/neighbourhood. In that respect we will utilize "Foursquare":

```
# Access the Foursquare website by using ID and s

CLIENT_ID = 'GN1PKJNKKDJYVYW4V2CDOWTQWBW0TAE5GJJ3
CLIENT_SECRET = 'XGU2XZYWMZS4T2ZXQERKZWN3TT0BUQ1F
VERSION = '20190330' # Foursquare API version
```

- We will use Beautiful soup in order to get from Wikipedia postal codes, Neighbourhoods and Boroughs of Toronto :

```
[22]: # target url for getting the postcodes of Canada
      url = 'https://en.wikipedia.org/wiki/List_of_postal_codes_of_Canada:_M'
      url
[22]: 'https://en.wikipedia.org/wiki/List_of_postal_codes_of_Canada:_M'
[23]: # Get access to wikipedia through Beautifulsoup
      html_content = requests.get(url).text
      soup = BeautifulSoup(html_content, "lxml")
[24]: # print soup in order to find table
      #print(soup.prettify())
[25]: # find and print table using soup
      table = soup.find('table',class_='wikitable sortable')
      # table
```

- Using wget we download from cocl.us /Geospatial  data the coordinates of Toronto and the relevant postal code :

```
n [39]: # Download coordinates and postal codes for Toronto from web using wget

        import wget
        url_get = wget.download( 'http://cocl.us/Geospatial_data/toronto_coordinates.csv')
        coordinates = pd.read_csv(url_get)
        coordinates.head()
```

ut[39]:

|   | 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 |

- Using Foursqure and with some data adjustments we get a list of Boroughs & neighbourhoods with the most common venues in Toronto Centre:

| | PostalCode | Borough | Neighborhoods | 1st Most Common Venue | 2nd Most Common Venue | 3rd Most Common Venue | 4th Most Common Venue | 5th Most Common Venue |
|---|---|---|---|---|---|---|---|---|
| 27 | M5V | DowntownToronto | CN Tower,Bathurst Quay,Island airport,Harbourf... | Airport Lounge | Airport Service | Airport Terminal | Plane | Harbor / Marina |
| 32 | M6J | WestToronto | Little Portugal,Trinity | Bar | Restaurant | Coffee Shop | Asian Restaurant | Vietnamese Restaurant |
| 3 | M4M | EastToronto | Studio District | Café | Coffee Shop | Gastropub | Brewery | Bakery |
| 25 | M5S | DowntownToronto | Harbord,University of Toronto | Café | Sandwich Place | Restaurant | Bookstore | Japanese Restaurant |
| 26 | M5T | DowntownToronto | Chinatown,Grange Park,Kensington Market | Café | Vietnamese Restaurant | Bar | Chinese Restaurant | Dumpling Restaurant |

3. **Methodology ( for all the below steps you can get a more detailed description and access to the python code using the following link:** https://github.com/stelios72/week-5-battle-of-Neighbourhood/blob/083d947169e984294f4cbf173dbbc10c75927994/capstone%20week%205%20final%20.ipynb

As a first step we import the below libraries:

- numpy, library to handle data in a vectorized manner
- pandas , library for data analysis
- json_normalize , transform JSON file into a pandas dataframe
- json , library to handle JSON files
- requests, library to handle requests
- geopy.geocoders, Nominatim , convert an address into latitude and longitude values
- folium, map rendering library
- Matplotlib and associated plotting modules
- k-means from clustering stage
- wget , download utility
- Beautifulsoup , for getting data from Wikipedia (our case)

We then get the Coordinates of the existing coffee shop located in Kolonaki Athens using "geopy.geocoders" , "Nominatim" . Based on those we get all venues near our existing shop utilizing Foursquare. In our case we have limited the number of venues to 200 and we have used a radius of 1km. We then group the results in order to get the frequency of the number of categories per venue as per below table:

| categories | name |
|---|---|
| American Restaurant | 1 |
| Art Museum | 1 |
| Bar | 4 |
| Bistro | 1 |
| Bookstore | 2 |
| Boutique | 4 |
| Café | 12 |
| Cheese Shop | 1 |
| Chocolate Shop | 1 |
| Clothing Store | 1 |
| Cocktail Bar | 3 |
| Coffee Shop | 3 |
| Cosmetics Shop | 2 |
| Cupcake Shop | 2 |
| Deli / Bodega | 1 |
| Dessert Shop | 5 |
| Electronics Store | 1 |
| French Restaurant | 2 |
| Furniture / Home Store | 1 |
| Gastropub | 1 |
| Gourmet Shop | 3 |
| Greek Restaurant | 3 |
| Grilled Meat Restaurant | 1 |
| Gym / Fitness Center | 1 |
| Hill | 1 |
| History Museum | 2 |
| Hotel | 4 |
| Hotel Bar | 1 |
| Italian Restaurant | 4 |
| Kafenio | 1 |
| Mediterranean Restaurant | 2 |
| Modern European Restaurant | 1 |
| Movie Theater | 1 |
| Museum | 2 |
| Nightclub | 2 |
| Pastry Shop | 1 |
| Peruvian Restaurant | 1 |
| Playground | 1 |
| Plaza | 2 |
| Restaurant | 2 |
| Sandwich Place | 1 |

Using folium, we will also map the results of venues near our existing shop in Athens as following:
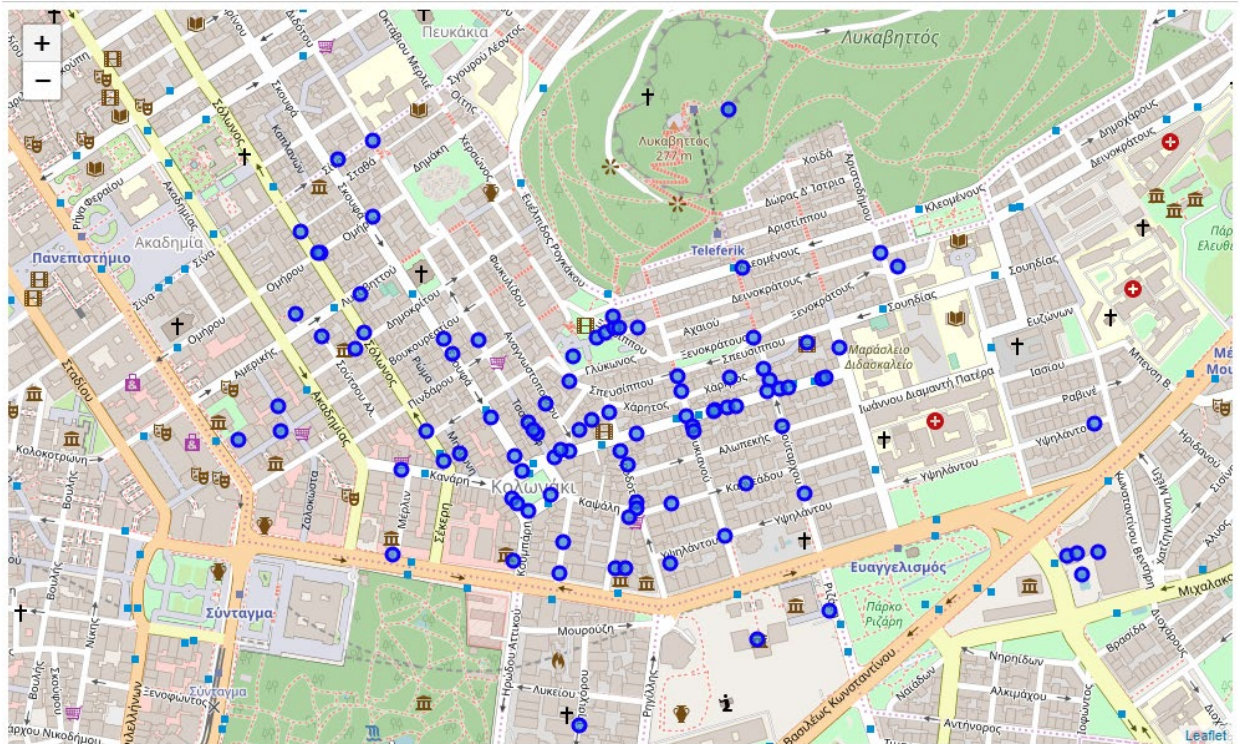


From the above table and map we can easily conclude that our existing most successful coffee shop in Athens is located in an area,  where there are many coffee shops/ cafeterias and restaurants. It seems that the specific Neighbourhood is a "busy" area of the centre of Athens.  We can also assume that the area where the shop of our client is located, has many visitors per day (due to high number of cafeterias and restaurants) , so it is important that the "new" shop in Toronto, will be located in an area which shares similar characteristics to Athens-kolonaki.

Our task as a Data scientist is to find Boroughs/Neighbourhoods in Toronto centre, where they appear to have similarities to Athens-Kolonaki.

In order to find such a Neighbourhood in Toronto centre we start getting some information from Wikipedia.

In specific we can get the postal code, Neighbourhoods and Boroughs of Toronto using BeautifulSoup:

```
[22]: # target url for getting the postcodes of Canada
      url = 'https://en.wikipedia.org/wiki/List_of_postal_codes_of_Canada:_M'
      url

[22]: 'https://en.wikipedia.org/wiki/List_of_postal_codes_of_Canada:_M'

[23]: # Get access to wikipedia through Beautifulsoup
      html_content = requests.get(url).text
      soup = BeautifulSoup(html_content, "lxml")

[24]: # print soup in order to find table
      #print(soup.prettify())

[25]: # find and print table using soup
      table = soup.find('table',class_='wikitable sortable')
      # table
```

Using pandas we convert the above data into pandas data frame and we get the below indicative table:

```
# Convert above data to pandas dataframe
df = pd.DataFrame(info, columns=['Postal Code', 'Borough', 'Neighbourhood'])
df
```

|    | Postal Code | Borough          | Neighbourhood     |
|----|-------------|------------------|-------------------|
| 0  | None        | None             | None              |
| 1  | M1A         | Not assigned     | Not assigned      |
| 2  | M2A         | Not assigned     | Not assigned      |
| 3  | M3A         | North York       | Parkwoods         |
| 4  | M4A         | North York       | Victoria Village  |
| 5  | M5A         | Downtown Toronto | Harbourfront      |
| 6  | M6A         | North York       | Lawrence Heights  |
| 7  | M6A         | North York       | Lawrence Manor    |
| 8  | M7A         | Downtown Toronto | Queen's Park      |
| 9  | M8A         | Not assigned     | Not assigned      |
| 10 | M9A         | Queen's Park     | Not assigned      |

Using wget we download from cocl.us /Geospatial_data the coordinates of Toronto and the relevant postal code :

```
n [39]: # Download coordinates and postal codes for Toronto from web using wget

        import wget
        url_get = wget.download( 'http://cocl.us/Geospatial_data/toronto_coordinates.csv')
        coordinates = pd.read_csv(url_get)
        coordinates.head()
```

ut[39]:

|   | 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 |

We will then merge the two tables in order to combine the info related to neighbourhood, Borough, Postal Code, and coordinates and after doing some fine tuning in the data we get the final table and map of Toronto centre /Neighbourhoods (using folium):

```
In [94]: # Limit Borough's to 'EastToronto', 'CentralToronto', 'DowntownToronto', 'WestToronto' name
         dff = ['EastToronto', 'CentralToronto', 'DowntownToronto', 'WestToronto']
         df6 = df5[df5['Borough'].isin(dff)].reset_index(drop=True)
         df6.head(10)
```

Out[94]:

| | PostalCode | Borough | Neighbourhood | Latitude | Longitude |
|---|---|---|---|---|---|
| 0 | M4E | EastToronto | The Beaches | 43.676357 | -79.293031 |
| 1 | M4K | EastToronto | The Danforth West,Riverdale | 43.679557 | -79.352188 |
| 2 | M4L | EastToronto | The Beaches West,India Bazaar | 43.668999 | -79.315572 |
| 3 | M4M | EastToronto | Studio District | 43.659526 | -79.340923 |
| 4 | M4N | CentralToronto | Lawrence Park | 43.728020 | -79.388790 |
| 5 | M4P | CentralToronto | Davisville North | 43.712751 | -79.390197 |
| 6 | M4R | CentralToronto | North Toronto West | 43.715383 | -79.405678 |
| 7 | M4S | CentralToronto | Davisville | 43.704324 | -79.388790 |
| 8 | M4T | CentralToronto | Moore Park,Summerhill East | 43.689574 | -79.383160 |
| 9 | M4V | CentralToronto | Deer Park,Forest Hill SE,Rathnelly,South Hill,... | 43.686412 | -79.400049 |

```
In [80]: # show dimensions of new constraint table of Toronto
         df6.shape
```

Out[80]: (39, 5)

```
In [81]: # map the above Borough's
         mapTorontoCenter = folium.Map(location=[latitudeToronto, longitudeToronto], zoom_start=12)

         for lat, long, post, borough, neigh in zip(df6['Latitude'], df6['Longitude'], df6['PostalCode'], df6['Borough'], df6['Neighbourhc
             label = "{} ({}): {}".format(borough, post, neigh)
             popup = folium.Popup(label, parse_html=True)
             folium.CircleMarker(
                 [lat, long],
                 radius=5,
                 popup=popup,
                 color='blue',
                 fill=True,
                 fill_color='#cc3139',
                 fill_opacity=0.8,
                 ).add_to(mapTorontoCenter)

         mapTorontoCenter
```

Out[81]:



Now that we have mapped all Toronto centre Neighbourhoods, we will utilize once more Foursquare in order to get the 5 most common venue categories in each Neighbourhood. An indicative table of our results is presented below:

:[87]:

| | PostalCode | Borough | Neighborhoods | 1st Most Common Venue | 2nd Most Common Venue | 3rd Most Common Venue | 4th Most Common Venue | 5th Most Common Venue |
|---|---|---|---|---|---|---|---|---|
| 27 | M5V | DowntownToronto | CN Tower,Bathurst Quay,Island airport,Harbourf... | Airport Lounge | Airport Service | Airport Terminal | Plane | Harbor / Marina |
| 32 | M6J | WestToronto | Little Portugal,Trinity | Bar | Restaurant | Coffee Shop | Asian Restaurant | Vietnamese Restaurant |
| 3 | M4M | EastToronto | Studio District | Café | Coffee Shop | Gastropub | Brewery | Bakery |
| 25 | M5S | DowntownToronto | Harbord,University of Toronto | Café | Sandwich Place | Restaurant | Bookstore | Japanese Restaurant |
| 26 | M5T | DowntownToronto | Chinatown,Grange Park,Kensington Market | Café | Vietnamese Restaurant | Bar | Chinese Restaurant | Dumpling Restaurant |

Since our target in to find a neighbourhood/borough of Toronto centre, which has similar characteristics to Athens-Kolonaki we will utilize from "sklearn.cluster" "KMeans". K-means clustering is a type of unsupervised learning, which is used when you have unlabeled data (i.e., data without defined categories or groups). The goal of this algorithm is to find groups in the data, with the number of groups represented by the variable K. The algorithm works iteratively to assign each data point to one of K groups based on the features that are provided. Data points are clustered based on feature similarity.

In our case we will use 6 clusters a summary of which is presented below:

| | PostalCode | Borough | Neighbourhood | Latitude | Longitude | Cluster | 1st Most Common Venue | 2nd Most Common Venue | 3rd Most Common Venue | 4th Most Common Venue | 5th Most Common Venue |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 27 | M5V | DowntownToronto | CN Tower,Bathurst Quay,Island airport,Harbourf... | 43.628947 | -79.394420 | 0 | Airport Lounge | Airport Service | Airport Terminal | Plane | Harbor / Marina |
| 32 | M6J | WestToronto | Little Portugal,Trinity | 43.647927 | -79.419750 | 0 | Bar | Restaurant | Coffee Shop | Asian Restaurant | Vietnamese Restaurant |
| 3 | M4M | EastToronto | Studio District | 43.659526 | -79.340923 | 0 | Café | Coffee Shop | Gastropub | Brewery | Bakery |
| 25 | M5S | DowntownToronto | Harbord,University of Toronto | 43.662696 | -79.400049 | 0 | Café | Sandwich Place | Restaurant | Bookstore | Japanese Restaurant |
| 26 | M5T | DowntownToronto | Chinatown,Grange Park,Kensington Market | 43.653206 | -79.400049 | 0 | Café | Vietnamese Restaurant | Bar | Chinese Restaurant | Dumpling Restaurant |
| 19 | M5J | DowntownToronto | Harbourfront East,Toronto Islands,Union Station | 43.640816 | -79.381752 | 0 | Coffee Shop | Aquarium | Hotel | Café | Italian Restaurant |
| 33 | M6K | WestToronto | Brockton,Exhibition Place,Parkdale Village | 43.636847 | -79.428191 | 0 | Coffee Shop | Café | Breakfast Spot | Grocery Store | Bakery |
| 28 | M5W | DowntownToronto | Stn A PO Boxes 25 The Esplanade | 43.646435 | -79.374846 | 0 | Coffee Shop | Café | Hotel | Restaurant | Italian Restaurant |
| 21 | M5L | DowntownToronto | Commerce Court,Victoria Hotel | 43.648198 | -79.379817 | 0 | Coffee Shop | Café | Hotel | Restaurant | Seafood Restaurant |
| 13 | M5A | DowntownToronto | Harbourfront | 43.654260 | -79.360636 | 0 | Coffee Shop | Café | Park | Bakery | Pub |
| 15 | M5C | DowntownToronto | St. James Town | 43.651494 | -79.375418 | 0 | Coffee Shop | Café | Restaurant | Bakery | Italian Restaurant |
| 29 | M5X | DowntownToronto | First Canadian Place,Underground city | 43.648429 | -79.382280 | 0 | Coffee Shop | Café | Restaurant | Steakhouse | Hotel |
| 14 | M5B | DowntownToronto | Ryerson,Garden District | 43.657162 | -79.378937 | 0 | Coffee Shop | Clothing Store | Cosmetics Shop | Café | Japanese Restaurant |
| 16 | M5E | DowntownToronto | Berczy Park | 43.644771 | -79.373306 | 0 | Coffee Shop | Cocktail Bar | Steakhouse | Cheese Shop | Café |
| 20 | M5K | DowntownToronto | Design Exchange,Toronto Dominion Centre | 43.647177 | -79.381576 | 0 | Coffee Shop | Hotel | Café | Restaurant | Steakhouse |
| 11 | M4X | DowntownToronto | Cabbagetown,St. James Town | 43.667967 | -79.367675 | 0 | Coffee Shop | Italian Restaurant | Restaurant | Café | Pub |
| 17 | M5G | DowntownToronto | Central Bay Street | 43.657952 | -79.387383 | 0 | Coffee Shop | Italian Restaurant | Sandwich Place | Burger Joint | Juice Bar |
| 12 | M4Y | DowntownToronto | Church and Wellesley | 43.665860 | -79.383160 | 0 | Coffee Shop | Japanese Restaurant | Restaurant | Sushi Restaurant | Gay Bar |
| 37 | M7A | DowntownToronto | Queen's Park | 43.662301 | -79.389494 | 0 | Coffee Shop | Park | Gym | Yoga Studio | Burrito Place |
| 9 | M4V | CentralToronto | Deer Park,Forest Hill SE,Rathnelly,South Hill,... | 43.686412 | -79.400049 | 0 | Coffee Shop | Pub | Supermarket | Fried Chicken Joint | Light Rail Station |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 6 | M4R | CentralToronto | North Toronto West | 43.715383 | -79.405678 | 0 | Coffee Shop | Sporting Goods Shop | Yoga Studio | Italian Restaurant | Salon / Barbershop |
| 18 | M5H | DowntownToronto | Adelaide,King,Richmond | 43.650571 | -79.384568 | 0 | Coffee Shop | Steakhouse | Café | Bar | Bakery |
| 5 | M4P | CentralToronto | Davisville North | 43.712751 | -79.390197 | 0 | Department Store | Gym | Park | Breakfast Spot | Hotel |
| 35 | M6R | WestToronto | Parkdale,Roncesvalles | 43.648960 | -79.456325 | 0 | Gift Shop | Restaurant | Dessert Shop | Breakfast Spot | Eastern European Restaurant |
| 1 | M4K | EastToronto | The Danforth West,Riverdale | 43.679557 | -79.352188 | 0 | Greek Restaurant | Coffee Shop | Italian Restaurant | Restaurant | Ice Cream Shop |
| 30 | M6G | DowntownToronto | Christie | 43.669542 | -79.422564 | 0 | Grocery Store | Café | Park | Candy Store | Athletics & Sports |
| 34 | M6P | WestToronto | High Park,The Junction South | 43.661608 | -79.464763 | 0 | Mexican Restaurant | Café | Thai Restaurant | Bar | Grocery Store |
| 2 | M4L | EastToronto | The Beaches West,India Bazaar | 43.668999 | -79.315572 | 0 | Park | Sandwich Place | Liquor Store | Fast Food Restaurant | Fish & Chips Shop |
| 31 | M6H | WestToronto | Dovercourt Village,Dufferin | 43.669005 | -79.442259 | 0 | Pharmacy | Bakery | Grocery Store | Art Gallery | Park |
| 38 | M7Y | EastToronto | Business Reply Mail Processing Centre 969 Eastern | 43.662744 | -79.321558 | 0 | Pizza Place | Auto Workshop | Brewery | Light Rail Station | Farmers Market |
| 36 | M6S | WestToronto | Runnymede,Swansea | 43.651571 | -79.484450 | 0 | Pizza Place | Coffee Shop | Café | Italian Restaurant | Sushi Restaurant |
| 7 | M4S | CentralToronto | Davisville | 43.704324 | -79.388790 | 0 | Pizza Place | Dessert Shop | Sandwich Place | Café | Italian Restaurant |
| 24 | M5R | CentralToronto | The Annex,North Midtown,Yorkville | 43.672710 | -79.405678 | 0 | Sandwich Place | Café | Coffee Shop | Pharmacy | Liquor Store |
| 22 | M5N | CentralToronto | Roselawn | 43.711695 | -79.416936 | 1 | Garden | Yoga Studio | Dessert Shop | Falafel Restaurant | Event Space |
| 23 | M5P | CentralToronto | Forest Hill North,Forest Hill West | 43.696948 | -79.411307 | 2 | Park | Jewelry Store | Trail | Sushi Restaurant | Yoga Studio |
| 10 | M4W | DowntownToronto | Rosedale | 43.679563 | -79.377529 | 2 | Park | Playground | Trail | Yoga Studio | Dessert Shop |
| 4 | M4N | CentralToronto | Lawrence Park | 43.728020 | -79.388790 | 3 | Dim Sum Restaurant | Park | Bus Line | Swim School | Yoga Studio |
| 0 | M4E | EastToronto | The Beaches | 43.676357 | -79.293031 | 4 | Neighborhood | Health Food Store | Trail | Pub | Department Store |
| 8 | M4T | CentralToronto | Moore Park,Summerhill East | 43.689574 | -79.383160 | 5 | Playground | Summer Camp | Yoga Studio | Dessert Shop | Event Space |
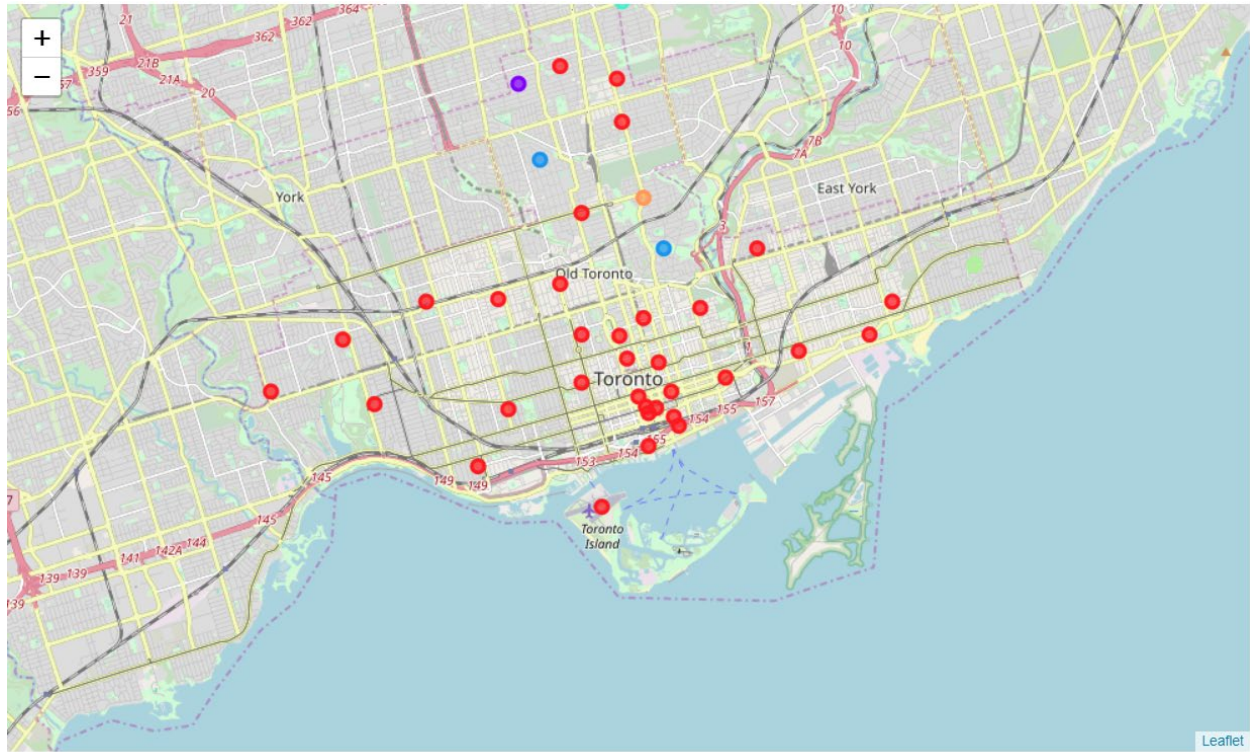
**Red: 0, Purple:  1, Blue: 2,  Green: 3, Yellow green: 4,  Orange: 5.**

## 4.     Results section where you discuss the results

From the last table, last map and the table that we have previously presented and refers to Athens Kolonaki venues we can conclude that neighbourhoods of cluster 0 (red) are  potential "candidates" for opening the "pilot" coffee shop in Toronto since they appear to have "similarities"  to Kolonaki Athens.

In specific the red cluster,   appears  to have many coffee shops and restaurants similarly to Kolonaki Athens. In addition, similarly to Kolonaki Neighbourhood, it is in Toronto Centre.

Considering the above we will suggest as potential candidate Neighbourhoods cluster 0

## 5.       Discussion section

As already mentioned Neighbourhoods of cluster 0 are potential candidates for opening a "pilot" coffee shop in the centre of Toronto Canada.

We strongly believe that before deciding,  which neighbourhood is the best candidate for opening a pilot store,  further investigation & information is necessary in order to come to a final conclusion.

 Indicatively the following criteria should be considered:

  - Real estate prices of each neighbourhood i.e cost of renting a store
  - Availability of commercial stores for rent
  - Pedestrian zones which usually increase the number of potential clients
  - Licensing procedure restrictions if any
  - Company internal factors (which as discussed are not currently disclosed to us)
  - Further investigate Neighbourhoods within zero cluster for other characteristics other than venue categories.

## 5.       Conclusion section

Considering our suggestions for further investigation mentioned in section 4,  we suggest cluster 0 (Borough's/Neighbourhood's) as potential candidates for opening a "pilot" coffee shop in the centre of Toronto Canada.