Capstone Project-Battle Of Neighborhoods:

Is Ahmedabad City is similar to Toronto city?

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Introduction

Ahmedabad is located in Gujarat, India. It plays a major role in Country's economy . Ahmedabad is known for his business capital and Restaurant businesses. Toronto is the capital city of the province of Ontario and the largest city in Canada. Toronto is a Centre of business, finance, arts, and culture, and is recognized as one of the most multicultural and cosmopolitan cities in the world. Both cities are well known in Malaysia, and become the top choice for local and foreign communities.

Brief information about both cities:

AHMEDABAD: Ahmadabad has emerged as an important economic and industrial hub in India. It is the second largest producer of cotton in India, and its stock exchange is the country's second oldest. Cricket is a popular sport in Ahmadabad, which houses the 54,000-seat Sardar Patel Stadium. The effects of liberalization of the Indian economy have energized the city's economy towards tertiary sector activities such as commerce, communication and construction. Ahmadabad's increasing population has resulted in an increase in the construction and housing industries resulting in recent development of skyscrapers.

(source: https://en.wikipedia.org/wiki/Ahmedabad)

TORONTO: Toronto is a prominent Centre for music, theatre, motion picture production, and television production, and is home to the headquarters of Canada's major national broadcast networks and media outlets. Its varied cultural institutions, which include numerous museums and galleries, festivals and public events, entertainment districts, national historic sites, and

sports activities, attract over 25 million tourists each year. Toronto is known for its many skyscrapers and high-rise buildings, in particular the tallest free-standing structure in the Western Hemisphere, the CN Tower.

(source: https://en.wikipedia.org/wiki/Toronto)

Objective (Business Problem)

In this project, we will study in details the area and doing classification using Foursquare data and machine learning segmentation and clustering. The aim of this project is to segment areas of Ahmedabad and Toronto based on the most common places captured from Foursquare.

Using segmentation and clustering, we hope we can determine:

- The similarity or dissimilarity of both cities
- Classification of area located inside the city whether it is residential, tourism places, or others
- Find an optimal location for establish a business
- Restaurant food popularity
- Identify optimal place for bus, railway or airplane

Data:

The data we used in this project is in .csv format. Hence, there are no accurate data is available for Ahmedabad City, so all data is collected by manually and Wikipedia. For, Toronto we used Wikipedia's List_of_postal_codes_of_Canada__M.html and Toronto geospatial data.

The data acquired from Wikipedia pages and restructure to csv file for easier manipulation and reading. Both Ahmedabad and Toronto city necessary data files uploaded to my Github for references. In, this data each row is referred by neighborhood.

Links to websites which are used to get data:

- https://en.wikipedia.org/wiki/Category:Neighbourhoods_in_Ahmedabad
- https://www.latlong.net/
- https://www.census2011.co.in/census/city/314-ahmedabad.html

Link to the data files are:

- https://github.com/mohit-n-rajput/Coursera_Capstone/blob/master/data/Geospatial_Coordinates.csv
- https://github.com/mohit-n-rajput/Coursera_Capstone/blob/master/data/List_of_postal_codes_of_Canada__M.html
- https://github.com/mohit-n-rajput/Coursera_Capstone/blob/master/data/Geospatial_Coordinates.csv

Another aspect to consider for this project is the Foursquare data. I believe that the data as good as provided, meaning although we are using Foursquare data for segmentation and clustering, the amount and accuracy of data captured can't 100% determine correct classification in real world. Also, there are no accurate data about Ahmedabad neighborhood , it's all collected by me.

Ahmedabad City Neighborhood Data:

In [3]:
```
#create dataframe
df_to = pd.read_csv('ahmedabad.csv',delimiter=',', header = None)
df_to.columns = ['Neighbourhood','Latitude','Longitude']

df_to.head(10)
```

Out[3]:

	Neighbourhood	Latitude	Longitude
0	Amraiwadi	23.010590	72.619034
1	Asarwa	23.044980	72.607700
2	Ashram Road	23.006986	72.557490
3	Astodia	23.016830	72.590975
4	Bapunagar	23.032660	72.629494
5	Behrampura	23.003589	72.583840
6	Bodakdev	23.044371	72.517921
7	Bopal	23.030050	72.464943
8	CG Road	23.039084	72.562786
9	Chandkheda	23.112650	72.583618

Toronto City Neighborhood Data:

```
In [169]: df_neighbours = pd.merge(df_to,toronto_geo_data,on=['Postcode'],how='inner')
          df_tor.head(15)
```

Out[169]:

	Postcode	Borough	Neighbourhood	Latitude	Longitude
0	M1B	Scarborough	Rouge, Malvern	43.806686	-79.194353
1	M1C	Scarborough	Highland Creek, Rouge Hill, Port Union	43.784535	-79.160497
2	M1E	Scarborough	Guildwood, Morningside, West Hill	43.763573	-79.188711
3	M1G	Scarborough	Woburn	43.770992	-79.216917
4	M1H	Scarborough	Cedarbrae	43.773136	-79.239476
5	M1J	Scarborough	Scarborough Village	43.744734	-79.239476
6	M1K	Scarborough	East Birchmount Park, Ionview, Kennedy Park	43.727929	-79.262029
7	M1L	Scarborough	Clairlea, Golden Mile, Oakridge	43.711112	-79.284577
8	M1M	Scarborough	Cliffcrest, Cliffside, Scarborough Village West	43.716316	-79.239476
9	M1N	Scarborough	Birch Cliff, Cliffside West	43.692657	-79.264848
10	M1P	Scarborough	Dorset Park, Scarborough Town Centre, Wexford ...	43.757410	-79.273304
11	M1R	Scarborough	Maryvale, Wexford	43.750072	-79.295849
12	M1S	Scarborough	Agincourt	43.794200	-79.262029
13	M1T	Scarborough	Clarks Corners, Sullivan, Tam O'Shanter	43.781638	-79.304302
14	M1V	Scarborough	Agincourt North, L'Amoreaux East, Milliken, St...	43.815252	-79.284577