**Week- 4 Assignment**

Data Description:

In order to initialise the first step, we need the data about existing parking lots in Toronto city. This data we are importing from ckan opensource website [(parking\_lots\_info\_2016)](https://ckan0.cf.opendata.inter.prod-toronto.ca/it/dataset/parking-lot-facilities/resource/09ec2066-4a25-4fa2-a67b-1732c69b4a5e), this data downloaded to internal pc memory in xlsx format.

The data is not the current information, these statistics were recorded in the year 2016.

This imported file has a data about parking lot name, available places, GIS coordinates of the location where they are located in Toronto, type of the parking lot (private/ public). By the help of geocoder framework in python we can extract the neighbourhoods of parking lots, where they were located by using those GIS coordinates.

Geocoder:

In python we have a special package called Geocoder, which is used to get the geospatial latitudes and longitudes of any city, place or a venue by giving it’s name following the country or state name to it and vice versa.

![Graphical user interface, text, application

Description automatically generated]()Image 1: Geocoder package- reverse method

As we see in the above image, geocoder package reverse method was used to get the location address, result of this method will be like a string of elements including name of the location, road, area, neighbourhood and city, separated by commas in between each object. In order to extract only the neighbourhood of parking lots split operation was implemented. Since it produces the list of address objects, where the 3rd places supposed to be the name of neighbourhood, we called the object with 2 in square brackets. Then all the neighbourhoods of parking lots are appended to the Neighbourhood list.

Foursquare:

Foursquare is an independent public platform, where it provides the location based information depending on API requests from different other interactive platforms. By using my on credentials of Foursquare I made some API requests to get the information on above acquired neighbourhoods in Toronto city. The whole reason is of involving Foursquare is to get aware of those neighbourhoods and how many venues are located in those.

Folium:

As soon as we get the data of venues of neighbourhoods, we plot them on a Toronto city map using folium package on python. It creates more interaction for a stakeholder with the data. Going further I have even added all the parking lots in those neighbourhoods in different colours (under 100 available places & others in different colours), this adds more information to the map.

Map

Description automatically generatedImage 2: Toronto map generated using Folium.

K-Mean :

I believe it is necessary to classify this unlabelled data into groups based on number of venues, number of parking plots and their places available in neighbourhoods. There might be better solution out there to provide much insight through these analysis to out client. But, for this moment I planned to proceed with K-mean clustering.