Introduction: Business Problem

This project is to identify areas in Toronto which are close to Indian restaurants. In order to help the stakeholders to find the optimal location for their restaurant business. By using the Foursquare data initially, we identified all Indian hotels that are in Toronto. Later we have identified the grocery stores nearby to restaurants. Further also we have done extensive collection of locations such as nearby bars and food courts. Clustering of those locations was then performed in order to create major zones of interest. The addresses of zone centres were created to be used as starting points for final exploration by stakeholders.

Taking the final decision on optimal location is a part of stakeholders based on specific characteristics of neighbourhoods and locations in every recommended zone. This is done by taking into consideration of several additional factors which include location feasibility and attraction such as public entertainment location, traffic levels, proximity to major roads, any tourism location, social and economic conditions of every neighbourhood. Further Indian resident colonies are also viewed as a major feasibility to start the restaurant.

Data

we have used data sources majorly Wikipedia page for extracting the required data towards developing our model to take decision to identify suitable location for starting indian style restaurant.

The URL used is https://en.wikipedia.org/wiki/List_of_postal_codes_of_Canada:_M

Data Based on defining the problem, many factors identified that influence our decision of starting new business. For this we have identified number Indian restaurants in the city followed by existing Bar in the neighbourhood and also number of other restaurants in the neighbourhood. We have decided to use regularly spaced grid of locations, cantered around city centre, to define our neighbourhoods. Following data sources will be needed to extract/generate the required information:

• centres of candidate areas will be generated algorithmically and approximate addresses of centres of those areas will be obtained using Google Maps API reverse geocoding

• number of restaurants and their type and location in every neighbourhood will be obtained using Foursquare API

• coordinate of Toronto centre will be obtained using Google Maps API geocoding of well-known Toronto location

Data frame with postal code information of locations from Toronto

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In [0]:  df.dropna(axis=0, how='any', thresh=None, subset=None, inplace=False)
         df.head(10)
```

Out[51]:

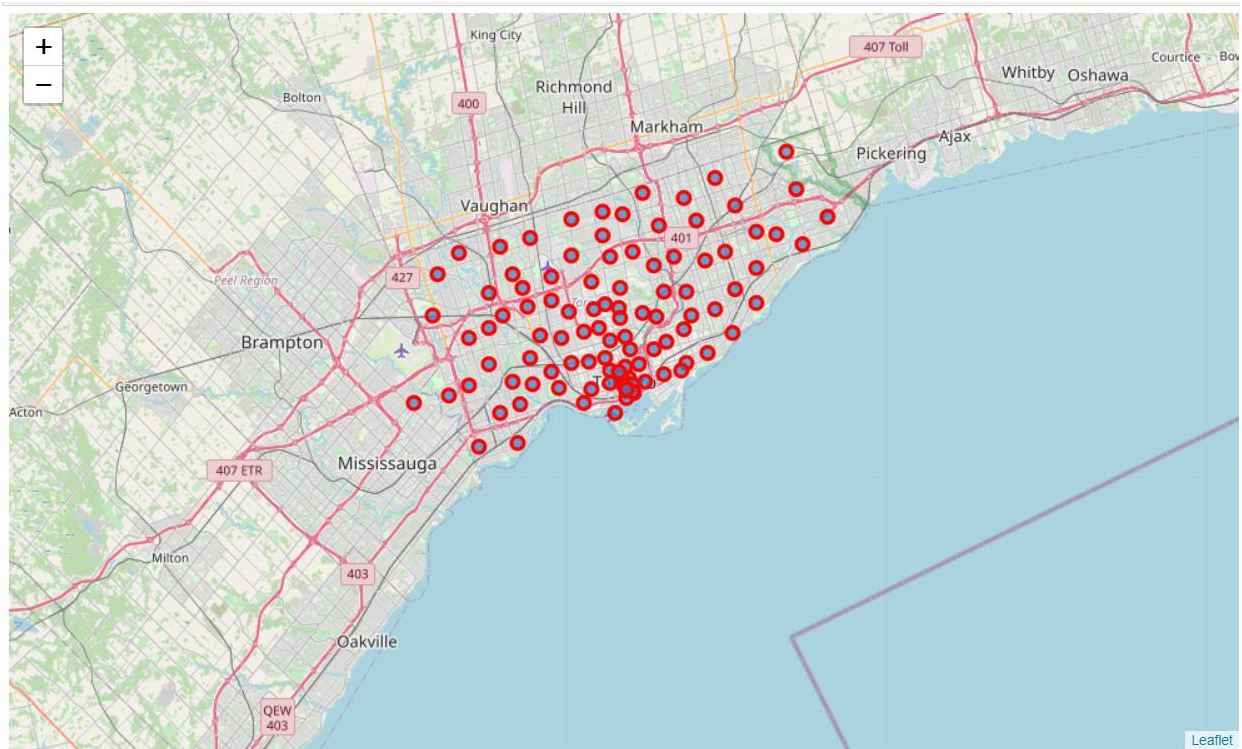|	Postalcode	Bourough	Neighbourhood
2	M3A	North York	Parkwoods
3	M4A	North York	Victoria Village
4	M5A	Downtown Toronto	Regent Park, Harbourfront
5	M6A	North York	Lawrence Manor, Lawrence Heights
6	M7A	Downtown Toronto	Queen's Park, Ontario Provincial Government
8	M9A	Etobicoke	Islington Avenue
9	M1B	Scarborough	Malvern, Rouge
11	M3B	North York	Don Mills
12	M4B	East York	Parkview Hill, Woodbine Gardens
13	M5B	Downtown Toronto	Garden District, Ryerson

- Dataframe with geolocation coordinates information of locations from Toronto

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In [0]: loc_data.head(10)
```

Out[49]:

	Postalcode	Bourough	Neighbourhood	Latitude	Longitude
0	M1B	Scarborough	Malvern, Rouge	43.806686	-79.194353
1	M1C	Scarborough	Rouge Hill, Port Union, Highland Creek	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	Kennedy Park, Ionview, East Birchmount Park	43.727929	-79.262029
7	M1L	Scarborough	Golden Mile, Clairlea, Oakridge	43.711112	-79.284577
8	M1M	Scarborough	Cliffside, Cliffcrest, Scarborough Village West	43.716316	-79.239476
9	M1N	Scarborough	Birch Cliff, Cliffside West	43.692657	-79.264848

Mapping the coordinates from the dataframe resulted in getting the venues of Toronto

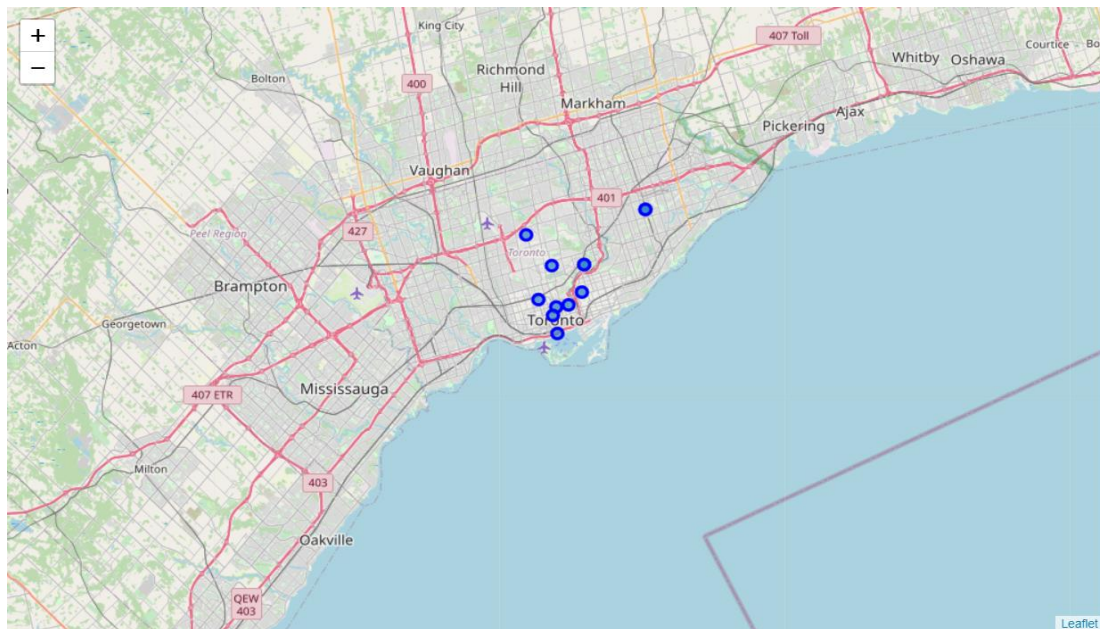Later we tried to find Indian restaurants in the city

- Indian Restaurants which are present in Toronto are listed in this dataframe

By mapping the coordinates of the locations in Folium we got the geo-map of those locations.

```
In [0]: indian_res
```

Out[30]:

	Neighbourhood	Neighbourhood Latitude	Neighbourhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
46	Dorset Park, Wexford Heights, Scarborough Town...	43.757410	-79.273304	Kairali	43.754915	-79.276945	Indian Restaurant
48	Dorset Park, Wexford Heights, Scarborough Town...	43.757410	-79.273304	Karaikudi Chettinad South Indian Restaurant	43.756042	-79.276276	Indian Restaurant
344	Thorncliffe Park	43.705369	-79.349372	Iqbal Kebab & Sweet Centre	43.705923	-79.351521	Indian Restaurant
352	Thorncliffe Park	43.705369	-79.349372	Hakka Garden	43.704578	-79.349770	Indian Restaurant
397	The Danforth West, Riverdale	43.679557	-79.352188	Sher-E-Punjab	43.677308	-79.353066	Indian Restaurant
505	Davisville	43.704324	-79.388790	Marigold Indian Bistro	43.702881	-79.388008	Indian Restaurant
560	St. James Town, Cabbagetown	43.667967	-79.367675	Butter Chicken Factory	43.667072	-79.369184	Indian Restaurant
626	Church and Wellesley	43.665860	-79.383160	Kothur Indian Cuisine	43.667872	-79.385659	Indian Restaurant
991	Central Bay Street	43.657952	-79.387383	Colaba Junction	43.660940	-79.385635	Indian Restaurant
1184	Harbourfront East, Union Station, Toronto Islands	43.640816	-79.381752	Indian Roti House	43.639060	-79.385422	Indian Restaurant
1410	Bedford Park, Lawrence Manor East	43.733283	-79.419750	The Copper Chimney	43.736195	-79.420271	Indian Restaurant
1433	The Annex, North Midtown, Yorkville	43.672710	-79.405678	Roti Cuisine of India	43.674618	-79.408249	Indian Restaurant

Conclusion

This methodology of identifying the Indian restaurants we identified that the number of restaurants are very less in Toronto. There are many bars and restaurants around city but the Indian restaurants only in very few in most locations. This gives a scope to start Indian restaurant in many locations where only one or two restaurants are available