Toronto Neighbourhoods- Indian restaurant

Identify the best location to open Indian restaurant in neighbourhoods of Toronto

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1 TABLE OF CONTENTS

2 INTRODUCTION

Toronto is the provincial capital of Ontario and the most populous city in Canada. The diverse population of Toronto reflects its current and historical role as an important destination for immigrants to Canada. More than 50 percent of residents belong to a visible minority population group, and over 200 distinct ethnic origins are represented among its inhabitants

The highest concentrations of Indian Canadians are found in the provinces of Ontario and British Columbia, followed by growing communities in Alberta and Quebec as well, with the majority of them being foreign-born

Toronto encompasses a geographical area formerly administered by many separate municipalities. These municipalities have each developed a distinct history and identity over the years, and their names remain in common use among Torontonians. Former municipalities include East York, Etobicoke, Forest Hill, Mimico, North York, Parkdale, Scarborough, Swansea, Weston and York. Throughout the city there exist hundreds of small neighborhoods and some larger neighborhoods covering a few square kilometers

2.1 BUSINESS PROBLEM

The objective of this project is to identify the best potential neighbourhoods where a Indian restaurant can be set up. As per Demographics of Toronto 12.6 % of population in Toronto is south Asian. Keeping this in mind the focus of this project is Indian restaurant.

2.2 TARGET AUDIENCE

Restaurateur who wants to open Indian restaurant.

Indians who want to explore the option for Indian restaurant in their neighbourhood

3 DATA

Based on the problem statement. The factors which will influence the final decision are Indian restaurant in neighbourhood and south Indian population in the area.

3.1 DATA SOURCE
Following data source will be needed to extract the required information

1. Neighbourhood of Toronto
   a. List of Postal code of Canada: M"
      (https://en.wikipedia.org/wiki/List_of_postal_codes_of_Canada:_M)
2. Geographical coordinates of the neighbourhoods
   a. https://cocl.us/Geospatial_data

3. Demographics of Toronto
    a. Source: https://en.wikipedia.org/wiki/Demographics_of_Toronto
4. Number of existing Indian restaurants in the neighbourhood
    a. Source: Foursquare API

3.2 DATA CLEANING

1. Scraping Toronto Neighbourhoods data from Wikipedia - https://en.wikipedia.org/wiki/List_of_postal_codes_of_Canada:_M

- Data frame will have 3 columns

Postcode	Borough	Neighbourhood

- Borough having value will be process. "Not assigned" Borough will be deleted from data frame.
- If there is no Neighbourhood for the Borough, then Neighbourhood will be same as Borough

	Postcode	Borough	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

2. Adding geographical coordinate to the neighbourhood

	Postcode	Borough	Neighbourhood	Latitude	Longitude
0	M3A	North York	Parkwoods	43.753259	-79.329656
1	M4A	North York	Victoria Village	43.725882	-79.315572
2	M5A	Downtown Toronto	Regent Park , Harbourfront	43.654260	-79.360636
3	M6A	North York	Lawrence Manor , Lawrence Heights	43.718518	-79.464763

3. Scraping demographics of Toronto in order to obtain the data of visible minorities.

|	Riding	EthnicOrigin	EthnicPop	Minority	MinorityPop
0	Parkdale-High Park	English	26.2	Black	5.3
1	Etobicoke Centre	Italian	27.1	South Asian	5.9
2	Etobicoke-Lakeshore	English	27.7	South Asian	5.5
3	Toronto-St. Paul's	English	28.3	Black	5.1
4	Eglinton-Lawrence	Canadian	31.8	Filipino	10.7
5	Davenport	Portuguese	31.9	Black	6.4
6	University-Rosedale	English	32.7	Chinese	14
7	Toronto-Danforth	English	32.8	Chinese	12.3
8	Beaches-East York	English	33.6	South Asian	10.9
9	Don Valley West	English	41.5	South Asian	13.3
10	Spadina-Fort York	English	42.8	Chinese	14.8
11	York Centre	Filipino	46.5	Filipino	16.5
12	Toronto Centre	English	49.7	South Asian	11.8
13	York South-Weston	Portuguese	54.9	Black	23.2
14	Scarborough Southwest	Canadian	56.5	South Asian	21.6
15	Don Valley East	East Indian	58.4	South Asian	17.1

4. Get venue data for neighbourhood using Foursquare API

	Neighborhood	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
0	Parkwoods	43.753259	-79.329656	Brookbanks Park	43.751976	-79.332140	Park
1	Parkwoods	43.753259	-79.329656	Variety Store	43.751974	-79.333114	Food & Drink Shop
2	Victoria Village	43.725882	-79.315572	Victoria Village Arena	43.723481	-79.315635	Hockey Arena
3	Victoria Village	43.725882	-79.315572	Tim Hortons	43.725517	-79.313103	Coffee Shop
4	Victoria Village	43.725882	-79.315572	Portugril	43.725819	-79.312785	Portuguese Restaurant

4 ANALYSIS

4.1 MAP OF TORONTO

Folium map of Toronto is created with super imposed neighbourhood markers.
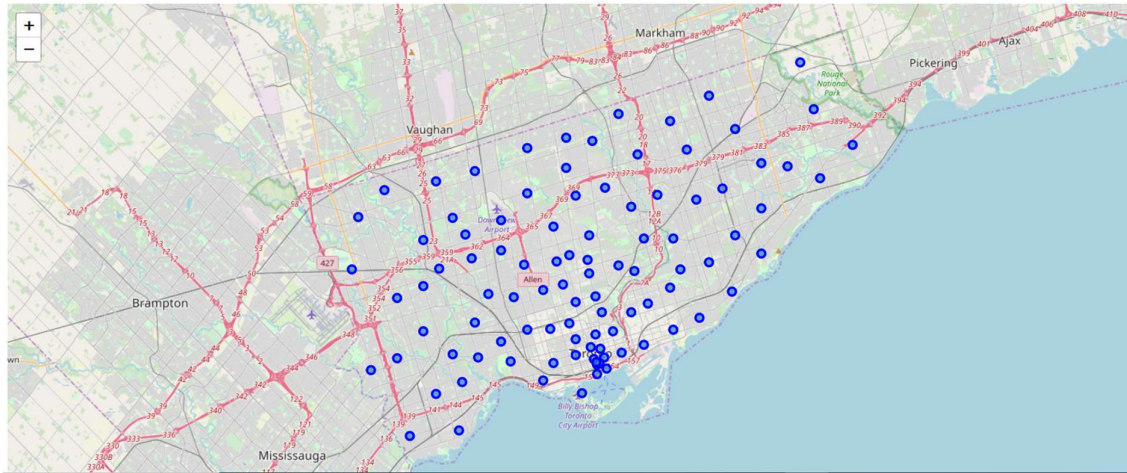
This shows the visual representation of all neighbourhoods of Toronto

4.2 INDIAN RESTAURANT IN NEIGHBOURHOODS

There are 12 Indian restaurants in neighbourhoods of Toronto.

```
In [60]: neg_ind= toronto_venues[toronto_venues['Venue Category'] == 'Indian Restaurant']
```

```
In [61]: neg_ind
```

Out[61]:

	Neighborhood	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
406	Woburn	43.770992	-79.216917	Al-Hamd Biryani & Pizza	43.767585	-79.219570	Indian Restaurant
493	Central Bay Street	43.657952	-79.387383	Colaba Junction	43.660940	-79.385635	Indian Restaurant
573	Thorncliffe Park	43.705369	-79.349372	Iqbal Kebab & Sweet Centre	43.705923	-79.351521	Indian Restaurant
579	Thorncliffe Park	43.705369	-79.349372	Hakka Garden	43.704578	-79.349770	Indian Restaurant
885	Harbourfront East , Union Station , Toronto Is...	43.640816	-79.381752	Indian Roti House	43.639060	-79.385422	Indian Restaurant
1315	Bedford Park , Lawrence Manor East	43.733283	-79.419750	The Copper Chimney	43.736195	-79.420271	Indian Restaurant
1398	Dorset Park , Wexford Heights , Scarborough To...	43.757410	-79.273304	Kairali	43.754915	-79.276945	Indian Restaurant
1399	Dorset Park , Wexford Heights , Scarborough To...	43.757410	-79.273304	Karaikudi Chettinad South Indian Restaurant	43.756042	-79.276276	Indian Restaurant
1483	The Annex , North Midtown , Yorkville	43.672710	-79.405678	Roti Cuisine of India	43.674618	-79.408249	Indian Restaurant
1528	Davisville	43.704324	-79.388790	Marigold Indian Bistro	43.702881	-79.388008	Indian Restaurant
1827	St. James Town , Cabbagetown	43.667967	-79.367675	Butter Chicken Factory	43.667072	-79.369184	Indian Restaurant
1998	Church and Wellesley	43.665860	-79.383160	Kothur Indian Cuisine	43.667872	-79.385659	Indian Restaurant

```
In [62]: neg_ind.shape
```

Out[62]: (12, 7)

4.3 SOUTH ASIAN POPULATION IN TORONTO

Let us analyse south Asian population in neighbourhoods. Scarborough has largest Indian population
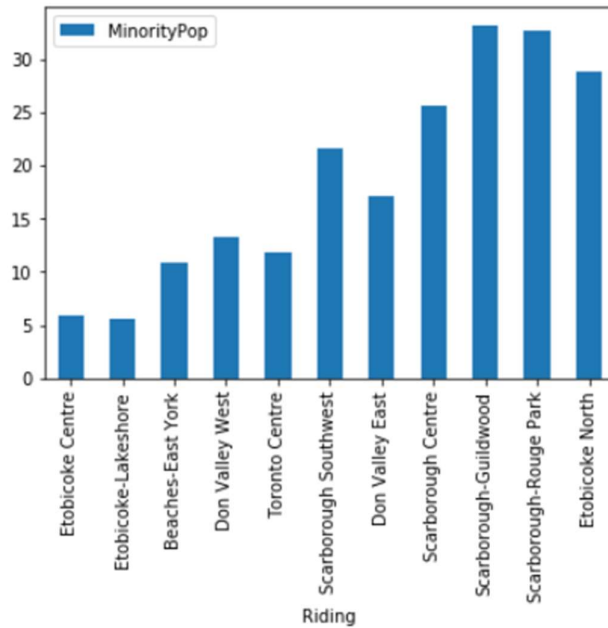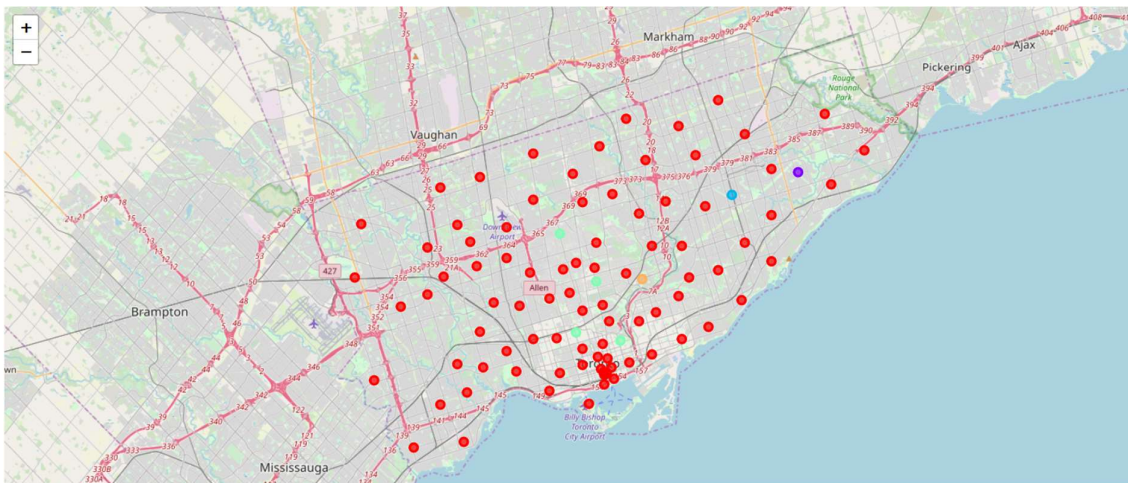
4.4 CLUSTERING THE NEIGHBOURHOOD

First step in K -mean clustering is to identify the K value to determine the number of clusters in given dataset.

Clustering the Toronto neighbourhood using K-mean using k=5

	Postcode	Borough	Neighborhood	Latitude	Longitude	Cluster Labels	Indian Restaurant
0	M3A	North York	Parkwoods	43.753259	-79.329656	0	0.0
1	M4A	North York	Victoria Village	43.725882	-79.315572	0	0.0
2	M5A	Downtown Toronto	Regent Park , Harbourfront	43.654260	-79.360636	0	0.0
3	M6A	North York	Lawrence Manor , Lawrence Heights	43.718518	-79.464763	0	0.0
4	M1B	Scarborough	Malvern , Rouge	43.806686	-79.194353	0	0.0

Analysing the clusters

There are 5 clusters 0,1,2,3,4.

Cluster 0: Has all neighbourhoods which has least Indian restaurants. It is shown in red colour in the map.

```
toronto_merged1.loc[toronto_merged1['Cluster Labels']==0]
```

80	M4V	Central Toronto	Summerhill West , Rathnelly , South Hill , For...	43.686412	-79.400049	0	0.000000
81	M5V	Downtown Toronto	CN Tower , King and Spadina , Railway Lands , ...	43.628947	-79.394420	0	0.000000
82	M8V	Etobicoke	New Toronto , Mimico South , Humber Bay Shores	43.605647	-79.501321	0	0.000000
83	M9V	Etobicoke	South Steeles , Silverstone , Humbergate , Jam...	43.739416	-79.588437	0	0.000000
84	M1W	Scarborough	Steeles West , L'Amoreaux West	43.799525	-79.318389	0	0.000000
85	M4W	Downtown Toronto	Rosedale	43.679563	-79.377529	0	0.000000
86	M8W	Etobicoke	Alderwood , Long Branch	43.602414	-79.543484	0	0.000000
87	M9W	EtobicokeNorthwest	Clairville , Humberwood , Woodbine Downs , Wes...	43.706748	-79.594054	0	0.000000
89	M5X	Downtown Toronto	First Canadian Place , Underground city	43.648429	-79.382280	0	0.000000
90	M8X	Etobicoke	The Kingsway , Montgomery Road , Old Mill North	43.653654	-79.506944	0	0.000000
91	M4Y	Downtown Toronto	Church and Wellesley	43.665860	-79.383160	0	0.011494
92	M8Y	Etobicoke	Old Mill South , King's Mill Park , Sunnylea , ...	43.636258	-79.498509	0	0.000000
93	M8Z	Etobicoke	Mimico NW , The Queensway West , South of Bloo...	43.628841	-79.520999	0	0.000000

Cluster 1 and 2: Has all neighbourhood which are densely populated with Indian restaurant. It is shown is blue and purple in the map.

```
toronto_merged1.loc[toronto_merged1['Cluster Labels']==1]
```

[52]:

	Postcode	Borough	Neighborhood	Latitude	Longitude	Cluster Labels	Indian Restaurant
19	M1G	Scarborough	Woburn	43.770992	-79.216917	1	0.2

```
toronto_merged1.loc[toronto_merged1['Cluster Labels']==2]
```

[53]:

	Postcode	Borough	Neighborhood	Latitude	Longitude	Cluster Labels	Indian Restaurant
60	M1P	Scarborough	Dorset Park , Wexford Heights , Scarborough To...	43.75741	-79.273304	2	0.333333

Cluster3: Has all neighbourhood which are sparsely populated with Indian restaurant. It is shown in green colour in the map.

```
toronto_merged1.loc[toronto_merged1['Cluster Labels']==3]
```

[54]:

	Postcode	Borough	Neighborhood	Latitude	Longitude	Cluster Labels	Indian Restaurant
50	M5M	North York	Bedford Park , Lawrence Manor East	43.733283	-79.419750	3	0.040000
69	M5R	Central Toronto	The Annex , North Midtown , Yorkville	43.672710	-79.405678	3	0.045455
73	M4S	Central Toronto	Davisville	43.704324	-79.388790	3	0.029412
88	M4X	Downtown Toronto	St. James Town , Cabbagetown	43.667967	-79.367675	3	0.022727

Cluster4: Has all neighbourhood which are medium populated with Indian restaurant. It is shown in orange colour in the map.

```
toronto_merged1.loc[toronto_merged1['Cluster Labels']==4]
```

[55]:

	Postcode	Borough	Neighborhood	Latitude	Longitude	Cluster Labels	Indian Restaurant
26	M4H	East York	Thorncliffe Park	43.705369	-79.349372	4	0.095238

5 RESULT AND CONCLUSION

The analysis brought the number of contenders down to four neighbourhoods —
Scarborough, Etobicoke, Central Toronto and East York

Though the Indian population is high in Scarborough, this neighbourhood already have many Indian restaurants. Competition will be very high. This Borough will not be the right place to open new Indian restaurant.

Central Toronto and East York also have few Indian restaurants and Indian population is medium in this area. These areas are not the best place to open new Indian restaurant

Etobicoke has good population of Indians and this area has no Indian restaurant. This place will be ideal or best to open new Indian restaurant as there will be no competitors. Also, Indian crowd will look forward to this restaurant as this will be only Indian restaurant in this area.

The results of the analysis highlight potential neighbourhoods where an Indian restaurant may be opened solely based on geographical location, proximity to competitors and South Asian population. This will only serve as a starting point in the overall investigation since there are a lot of other factors — rental charges, availability of commercial spaces, the appeal of each location, proximity to major roads, access through public transport, etc. — that influence such a decision.