


FINAL COURSERA PROJECT

BEST INDIAN PLACE TO STAY IN TORONTO

Done by
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INTRODUCTION

- ▶ Studying abroad is one of the most exciting parts of a student's life. However, students from India do face various challenges. Despite it being the perfect opportunity to travel, meet new friends, learn a new language, amongst many other things, for some, moving from India to another country isn't an easy transition.
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PROBLEM

- Transition to Toronto for Higher Studies is one of the most common challenges of studying abroad is the language barrier. Perhaps you spent the last five years studying the language, but once you arrive to the country, it seems completely foreign to you. Locals are using slang you're unfamiliar with, and several words can be used to describe one thing. Trying to understand a different currency is another common challenge students face. You want to ensure you are familiar with the conversion this way you don't end up spending more money than you should. Many countries include taxes in their prices, however, international students should be aware in North American countries, taxes are not included and so they must be calculated in addition to the price presented on the product. Every country has different cultural standards. In addition to getting familiar with languages and currencies, you will have to adjust to the local culture. It's easy to begin feeling homesick when everything around you is so unfamiliar. You will miss the things you find comfort in, such as the couch in your living room and your annoying yet loving sibling. After overcoming all of these challenges, you will realize how much you truly love the country you're in. When it's time to leave, you will miss the locals, the food, and many of the small things like the cafe down the street. You will miss the freedom, the adventures, the challenges... leaving will be a challenge on its own.




DATA SELECTION

- For this course we need the following data
- Toronto city data about their neighborhood, postal code, Borough along with their latitude and longitude.
- Geospace data from the net to visualize the data as maps and markers.
- Other indian types restaurants, caffe shops, neighborhood and other datas



EXTRACTING THE DATA

- The data are extracted for the Toronto neighborhood from the wikipedia
 - Using the geocoder package to get the latitude and longitude of the area and use it to construct the maps
 - At last Foursquare API to get the data about the datas and other things related to Indian Community
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METHODOLOGY

- This project will give the best places for the students to shift and stay in Toronto for their higher studies. They will be surrounded by the other similar Indian peoples will make their stay much more easier and comfortable. I have used KMeans Clustering technique for analysing the dataframe which consists of the Indian community peoples. *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.

Toronto city data

	Postal Code	Borough	Neighborhood
0	M1A	Not assigned	Not assigned
1	M2A	Not assigned	Not assigned
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
7	M8A	Not assigned	Not assigned
8	M9A	Etobicoke	Islington Avenue, Humber Valley Village
9	M1B	Scarborough	Malvern, Rouge
10	M2B	Not assigned	Not assigned
11	M3B	North York	Don Mills
12	M4B	East York	Parkview Hill, Woodbine Gardens
13	M5B	Downtown Toronto	Garden District, Ryerson
14	M6B	North York	Glencairn
15	M7B	Not assigned	Not assigned
16	M8B	Not assigned	Not assigned
17	M9B	Etobicoke	West Deane Park, Princess Gardens, Martin Grov...
18	M1C	Scarborough	Rouge Hill, Port Union, Highland Creek
19	M2C	Not assigned	Not assigned

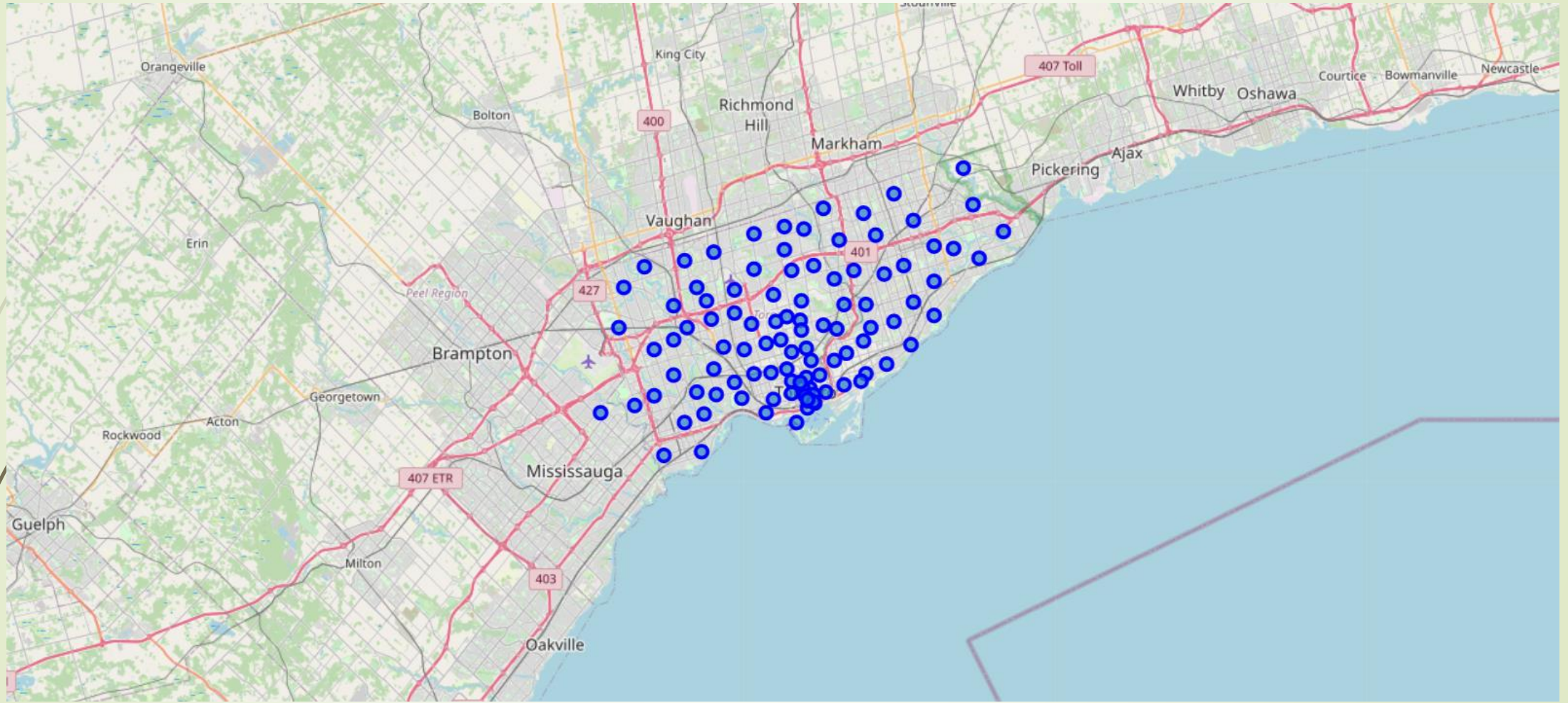
Data excluding Not assigned

	Postal Code	Borough	Neighborhood
0	M3A	North York	Parkwoods
1	M4A	North York	Victoria Village
2	M5A	Downtown Toronto	Regent Park, Harbourfront
3	M6A	North York	Lawrence Manor, Lawrence Heights
4	M7A	Downtown Toronto	Queen's Park, Ontario Provincial Government
5	M9A	Etobicoke	Islington Avenue, Humber Valley Village
6	M1B	Scarborough	Malvern, Rouge
7	M3B	North York	Don Mills
8	M4B	East York	Parkview Hill, Woodbine Gardens
9	M5B	Downtown Toronto	Garden District, Ryerson
10	M6B	North York	Glencairn
11	M9B	Etobicoke	West Deane Park, Princess Gardens, Martin Grov...
12	M1C	Scarborough	Rouge Hill, Port Union, Highland Creek
13	M3C	North York	Don Mills
14	M4C	East York	Woodbine Heights
15	M5C	Downtown Toronto	St. James Town
16	M6C	York	Humewood-Cedarvale
17	M9C	Etobicoke	Eringate, Bloordale Gardens, Old Burnhamthorpe...
18	M1E	Scarborough	Guildwood, Morningside, West Hill
19	M4E	East Toronto	The Beaches

Merging Latitude and Longitude

	Postal Code	Borough	Neighborhood	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
4	M7A	Downtown Toronto	Queen's Park, Ontario Provincial Government	43.662301	-79.389494
5	M9A	Etobicoke	Islington Avenue, Humber Valley Village	43.667856	-79.532242
6	M1B	Scarborough	Malvern, Rouge	43.806686	-79.194353
7	M3B	North York	Don Mills	43.745906	-79.352188
8	M4B	East York	Parkview Hill, Woodbine Gardens	43.706397	-79.309937
9	M5B	Downtown Toronto	Garden District, Ryerson	43.657162	-79.378937
10	M6B	North York	Glencairn	43.709577	-79.445073
11	M9B	Etobicoke	West Deane Park, Princess Gardens, Martin Grov...	43.650943	-79.554724
12	M1C	Scarborough	Rouge Hill, Port Union, Highland Creek	43.784535	-79.160497
13	M3C	North York	Don Mills	43.725900	-79.340923
14	M4C	East York	Woodbine Heights	43.695344	-79.318389
15	M5C	Downtown Toronto	St. James Town	43.651494	-79.375418
16	M6C	York	Humewood-Cedarvale	43.693781	-79.428191
17	M9C	Etobicoke	Eringate, Bloordale Gardens, Old Burnhamthorpe...	43.643515	-79.577201
18	M1E	Scarborough	Guildwood, Morningside, West Hill	43.763573	-79.188711
19	M4E	East Toronto	The Beaches	43.676357	-79.293031

Toronto city map



Indian communities in the city

	name	categories	lat	lng	postalCode
0	Banjara Indian Cuisine	Indian Restaurant	43.662916	-79.421911	M6G 1L8
1	Kothur Indian Cuisine	Indian Restaurant	43.667872	-79.385659	M4Y
2	The Host	Indian Restaurant	43.669631	-79.395599	M5R 1A9
3	Pukka Restaurant	Indian Restaurant	43.681055	-79.429187	M6C 1B6
4	Roti Cuisine of India	Indian Restaurant	43.674618	-79.408249	M5R 2X8
5	Utsav Indian Cuisine	Indian Restaurant	43.671154	-79.390802	M5R 1B8
6	Gandhi Cuisine	Indian Restaurant	43.647405	-79.403074	M5V 2B5
7	Madras Masala	Indian Restaurant	43.662959	-79.421646	M6G 1L7
8	Little India Restaurant	Indian Restaurant	43.650319	-79.388998	M5V 1Z4
9	King's Palace	Indian Restaurant	43.672214	-79.385843	M4W 2M9
10	My Roti Place	Indian Restaurant	43.648663	-79.397306	M5V 2A9
11	Butter Chicken Factory	Indian Restaurant	43.667072	-79.369184	M4K 1P6
12	Colaba Junction	Indian Restaurant	43.660940	-79.385635	M5S 1Y9
13	Aroma Fine Indian Restaurant	Indian Restaurant	43.646463	-79.389644	M5V 1J5
14	Marigold Indian Bistro	Indian Restaurant	43.702881	-79.388008	NaN
15	Kathmandu Restaurant	Indian Restaurant	43.671023	-79.387957	NaN
16	Mother India	Indian Restaurant	43.640718	-79.436259	M6K 1M2
17	Bombay Palace	Indian Restaurant	43.651174	-79.372140	NaN
18	Indian Roti House	Indian Restaurant	43.639060	-79.385422	M5J 1B5
19	259 Host	Indian Restaurant	43.644869	-79.390837	M5V 3E4

Indian communities in Toronto



Merging postal codes with the Indian communities data

	name	categories	lat	lng	postalCode
0	Banjara Indian Cuisine	Indian Restaurant	43.662916	-79.421911	M6G
1	Kothur Indian Cuisine	Indian Restaurant	43.667872	-79.385659	M4Y
2	The Host	Indian Restaurant	43.669631	-79.395599	M5R
3	Pukka Restaurant	Indian Restaurant	43.681055	-79.429187	M6C
4	Roti Cuisine of India	Indian Restaurant	43.674618	-79.408249	M5R
5	Utsav Indian Cuisine	Indian Restaurant	43.671154	-79.390802	M5R
6	Gandhi Cuisine	Indian Restaurant	43.647405	-79.403074	M5V
7	Madras Masala	Indian Restaurant	43.662959	-79.421646	M6G
8	Little India Restaurant	Indian Restaurant	43.650319	-79.388998	M5V
9	King's Palace	Indian Restaurant	43.672214	-79.385843	M4W
10	My Roti Place	Indian Restaurant	43.648663	-79.397306	M5V
11	Butter Chicken Factory	Indian Restaurant	43.667072	-79.369184	M4K
12	Colaba Junction	Indian Restaurant	43.660940	-79.385635	M5S
13	Aroma Fine Indian Restaurant	Indian Restaurant	43.646463	-79.389644	M5V
14	Marigold Indian Bistro	Indian Restaurant	43.702881	-79.388008	NaN
15	Kathmandu Restaurant	Indian Restaurant	43.671023	-79.387957	NaN
16	Mother India	Indian Restaurant	43.640718	-79.436259	M6K
17	Bombay Palace	Indian Restaurant	43.651174	-79.372140	NaN
18	Indian Roti House	Indian Restaurant	43.639060	-79.385422	M5J
19	259 Host	Indian Restaurant	43.644869	-79.390837	M5V

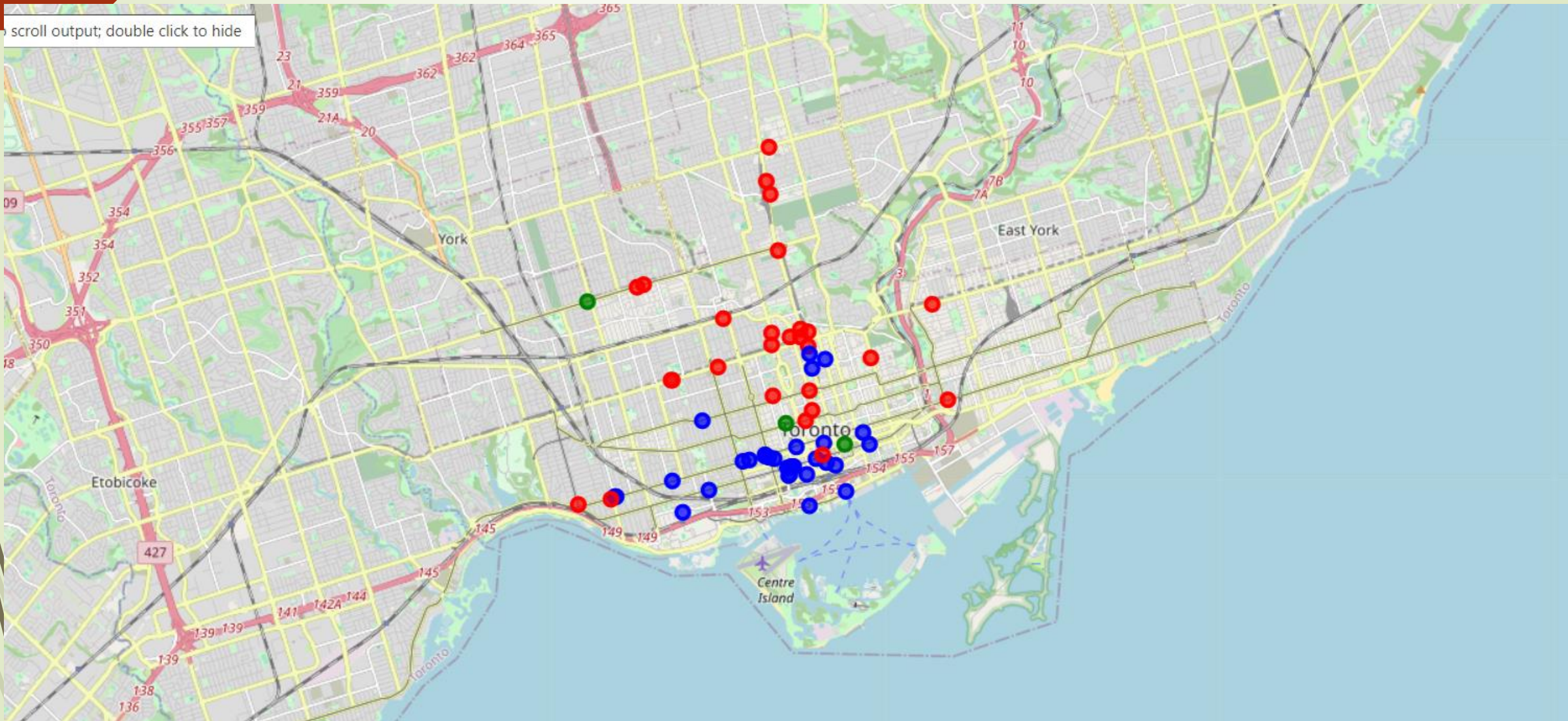
One hot encoding of the data

	postalCode	Bar	Breakfast Spot	Café	Coffee Shop	Deli / Bodega	Diner	Event Space	Food Court	Grocery Store	Hotel	Indian Restaurant	Italian Restaurant	Market	Middle Eastern Restaurant	North Indian Restaurant	Sri Lankan Restaurant	Vegetarian / Vegan Restaurant
0	M4K	0.0	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.0	0.00	0.000000	1.000000	0.0	0.0	0.000000	0.000000	0.000000	0.0
1	M4M	0.0	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.0	0.00	0.000000	1.000000	0.0	0.0	0.000000	0.000000	0.000000	0.0
2	M4P	0.0	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.0	0.00	0.000000	1.000000	0.0	0.0	0.000000	0.000000	0.000000	0.0
3	M4S	0.0	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.0	0.00	0.000000	1.000000	0.0	0.0	0.000000	0.000000	0.000000	0.0
4	M4T	0.0	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.0	0.00	0.000000	1.000000	0.0	0.0	0.000000	0.000000	0.000000	0.0
5	M4W	0.0	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.0	0.00	0.000000	1.000000	0.0	0.0	0.000000	0.000000	0.000000	0.0
6	M4Y	0.0	0.000000	0.000000	0.000000	0.000000	0.333333	0.0	0.0	0.00	0.000000	0.333333	0.0	0.0	0.000000	0.333333	0.000000	0.0
7	M5A	0.0	0.000000	0.000000	0.000000	0.333333	0.333333	0.0	0.0	0.00	0.000000	0.333333	0.0	0.0	0.000000	0.000000	0.000000	0.0
8	M5C	0.0	0.000000	0.000000	0.000000	0.000000	0.000000	1.0	0.0	0.00	0.000000	0.000000	0.0	0.0	0.000000	0.000000	0.000000	0.0
9	M5G	0.0	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.0	0.00	0.000000	1.000000	0.0	0.0	0.000000	0.000000	0.000000	0.0
10	M5H	0.5	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.0	0.00	0.000000	0.500000	0.0	0.0	0.000000	0.000000	0.000000	0.0
11	M5J	0.0	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.0	0.00	0.000000	0.666667	0.0	0.0	0.000000	0.333333	0.000000	0.0
12	M5R	0.0	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.0	0.25	0.000000	0.750000	0.0	0.0	0.000000	0.000000	0.000000	0.0
13	M5S	0.0	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.0	0.00	0.000000	1.000000	0.0	0.0	0.000000	0.000000	0.000000	0.0
14	M5T	1.0	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.0	0.00	0.000000	0.000000	0.0	0.0	0.000000	0.000000	0.000000	0.0
15	M5V	0.0	0.066667	0.066667	0.000000	0.000000	0.000000	0.0	0.0	0.00	0.066667	0.666667	0.0	0.0	0.066667	0.000000	0.066667	0.0
16	M5X	0.0	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.0	0.00	0.000000	1.000000	0.0	0.0	0.000000	0.000000	0.000000	0.0
17	M6C	0.0	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.0	0.00	0.000000	1.000000	0.0	0.0	0.000000	0.000000	0.000000	0.0
18	M6E	0.0	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.0	0.00	0.000000	0.000000	1.0	0.0	0.000000	0.000000	0.000000	0.0
19	M6G	0.0	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.0	0.00	0.000000	1.000000	0.0	0.0	0.000000	0.000000	0.000000	0.0

Assigning cluster to the data

	postalCode	Indian Restaurant	Cluster Labels
0	M4K	1.000000	0
1	M4M	1.000000	0
2	M4P	1.000000	0
3	M4S	1.000000	0
4	M4T	1.000000	0
5	M4W	1.000000	0
6	M4Y	0.333333	1
7	M5A	0.333333	1
8	M5C	0.000000	2
9	M5G	1.000000	0
10	M5H	0.500000	1
11	M5J	0.666667	1
12	M5R	0.750000	0
13	M5S	1.000000	0
14	M5T	0.000000	2
15	M5V	0.666667	1
16	M5X	1.000000	0
17	M6C	1.000000	0
18	M6E	0.000000	2
19	M6G	1.000000	0

Different clusters of data



Highest cluster in the data

	postalCode	Indian Restaurant	Cluster Labels	name	categories	lat	lng
0	M4K	1.00	0	Butter Chicken Factory	Indian Restaurant	43.667072	-79.369184
0	M4K	1.00	0	Sher-E-Punjab	Indian Restaurant	43.677308	-79.353066
1	M4M	1.00	0	Siddhartha Indian	Indian Restaurant	43.659117	-79.348948
2	M4P	1.00	0	TYC by Sanjeev Kapoor (The Yellow Chilli)	Indian Restaurant	43.707034	-79.396109
3	M4S	1.00	0	Khau Gully	Indian Restaurant	43.700540	-79.396927
4	M4T	1.00	0	Chef of India	Indian Restaurant	43.687391	-79.393663
5	M4W	1.00	0	King's Palace	Indian Restaurant	43.672214	-79.385843
5	M4W	1.00	0	Sukhi Biryani House	Indian Restaurant	43.669478	-79.385976
5	M4W	1.00	0	Esther's Soup Kitchen	Indian Restaurant	43.670991	-79.388014
5	M4W	1.00	0	Randys Roti & Doubles	Indian Restaurant	43.672560	-79.387765
9	M5G	1.00	0	Indian Biryani House	Indian Restaurant	43.655120	-79.386645
9	M5G	1.00	0	Flaming Stove	Indian Restaurant	43.698273	-79.395831
9	M5G	1.00	0	Matagali	Indian Restaurant	43.657096	-79.384843
12	M5R	0.75	0	The Host	Indian Restaurant	43.669631	-79.395599
12	M5R	0.75	0	Roti Cuisine of India	Indian Restaurant	43.674618	-79.408249
12	M5R	0.75	0	Utsav Indian Cuisine	Indian Restaurant	43.671154	-79.390802
13	M5S	1.00	0	Colaba Junction	Indian Restaurant	43.660940	-79.385635
13	M5S	1.00	0	Veda Healthy Indian Takeout	Indian Restaurant	43.659806	-79.395084
13	M5S	1.00	0	Bombay Roti	Indian Restaurant	43.665312	-79.409545
16	M5X	1.00	0	Amaya Express	Indian Restaurant	43.648636	-79.382054
17	M6C	1.00	0	Pukka Restaurant	Indian Restaurant	43.681055	-79.429187



RESULTS AND CONCLUSION

- From the data analysis and machine learning algorithms, it is evident that most of the Indian communities are present on cluster 1. Hence it is comfortable for the people who are moving to Toronto can stay in places listed below
 - East Toronto
 - Central Toronto
 - Downtown Toronto



THANK YOU