CAPSTONE_PROJECT

IDENTIFYING_AREAS_ACCORDING_TO_THEIR_NATURE

Introduction/Business Problem

The main aim of this project is to find the perfect area for all types of users in the city of Toronto. The users find difficulty in finding the areas for residential and business purposes. This project guide them in providing solutions for the users.

Data and Methodology

1.Where data of postal codes of Canada will be taken from Wikipedia.

	Postalcode	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

2. After cleaning of data

	Postalcode	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

3. Geo spatial will be taken from 'http://cocl.us/Geospatial_data'

	Postal Code	Latitude	Longitude
0	M1B	43.806686	-79.194353
1	M1C	43.784535	-79.160497
2	M1E	43.763573	-79.188711
3	M1G	43.770992	-79.216917
4	M1H	43.773136	-79.239476

4. After merging of both the data

	Postalcode	Borough	Neighborhood	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. Plotting of the base data's
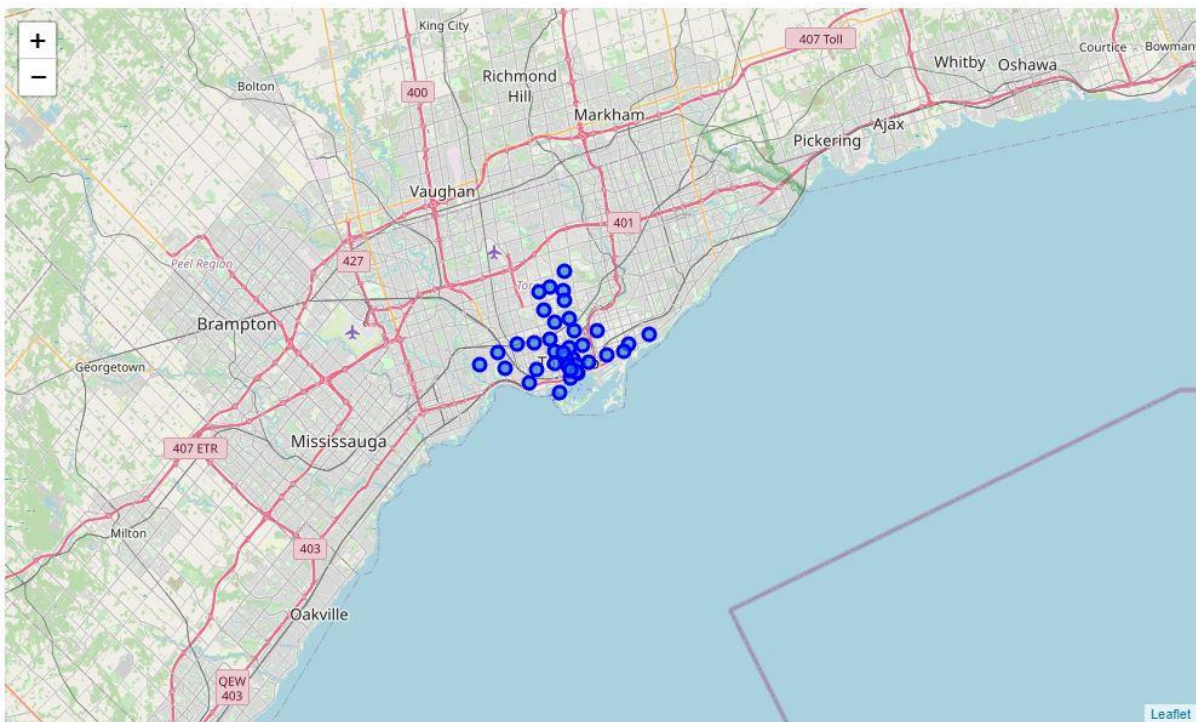
6. Venue data of the same has been obtain from foursquare ID

|	PostalCode	Borough	Neighborhood	BoroughLatitude	BoroughLongitude	VenueName	VenueLatitude	VenueLongitude	VenueCategory
0	M4E	East Toronto	The Beaches	43.676357	-79.293031	Glen Manor Ravine	43.676821	-79.293942	Trail
1	M4E	East Toronto	The Beaches	43.676357	-79.293031	The Big Carrot Natural Food Market	43.678879	-79.297734	Health Food Store
2	M4E	East Toronto	The Beaches	43.676357	-79.293031	Grover Pub and Grub	43.679181	-79.297215	Pub
3	M4E	East Toronto	The Beaches	43.676357	-79.293031	Upper Beaches	43.680563	-79.292869	Neighborhood
4	M4K	East Toronto	The Danforth West, Riverdale	43.679557	-79.352188	MenEssentials	43.677820	-79.351265	Cosmetics Shop

7. After cleaning the data

	PostalCode	Borough	Neighborhoods	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue	9th Most Common Venue
27	M5V	Downtown Toronto	CN Tower, King and Spadina, Railway Lands, Har...	Airport Service	Airport Lounge	Boutique	Airport	Airport Food Court	Airport Terminal	Sculpture Garden	Harbor / Marina	Rental C Locati
32	M6J	West Toronto	Little Portugal, Trinity	Bar	Coffee Shop	Asian Restaurant	Vietnamese Restaurant	Men's Store	Restaurant	Café	Yoga Studio	Record Sh
35	M6R	West Toronto	Parkdale, Roncesvalles	Breakfast Spot	Gift Shop	Dessert Shop	Cuban Restaurant	Eastern European Restaurant	Dog Run	Italian Restaurant	Bar	Restaura
25	M5S	Downtown Toronto	University of Toronto, Harbord	Café	Bar	Japanese Restaurant	Bookstore	Sandwich Place	Restaurant	Bakery	Yoga Studio	P
		West	Brockton, Parkdale			Breakfast				Burrito		

8. After Kmeans clustering

	Cluster Labels	Postalcode	Borough	Neighborhood	Latitude	Longitude
0	0	M4E	East Toronto	The Beaches	43.676357	-79.293031
1	0	M4K	East Toronto	The Danforth West, Riverdale	43.679557	-79.352188
2	0	M4L	East Toronto	India Bazaar, The Beaches West	43.668999	-79.315572
3	0	M4M	East Toronto	Studio District	43.659526	-79.340923
4	2	M4N	Central Toronto	Lawrence Park	43.728020	-79.388790
5	0	M4P	Central Toronto	Davisville North	43.712751	-79.390197
6	0	M4R	Central Toronto	North Toronto West, Lawrence Park	43.715383	-79.405678
7	0	M4S	Central Toronto	Davisville	43.704324	-79.388790
8	0	M4T	Central Toronto	Moore Park, Summerhill East	43.689574	-79.383160
9	0	M4V	Central Toronto	Summerhill West, Rathnelly, South Hill, Forest...	43.686412	-79.400049
10	2	M4W	Downtown Toronto	Rosedale	43.679563	-79.377529
11	0	M4X	Downtown Toronto	St. James Town, Cabbagetown	43.667967	-79.367675
12	0	M4Y	Downtown Toronto	Church and Wellesley	43.665860	-79.383160
13	0	M5A	Downtown Toronto	Regent Park, Harbourfront	43.654260	-79.360636
14	0	M5B	Downtown Toronto	Garden District, Ryerson	43.657162	-79.378937
15	0	M5C	Downtown Toronto	St. James Town	43.651494	-79.375418
16	0	M5E	Downtown Toronto	Berczy Park	43.644771	-79.373306
17	0	M5G	Downtown Toronto	Central Bay Street	43.657952	-79.387383
18	0	M5H	Downtown Toronto	Richmond, Adelaide, King	43.650571	-79.384568
19	0	M5J	Downtown Toronto	Harbourfront East, Union Station, Toronto Islands	43.640816	-79.381752
20	0	M5K	Downtown Toronto	Toronto Dominion Centre, Design Exchange	43.647177	-79.381576
21	0	M5L	Downtown Toronto	Commerce Court, Victoria Hotel	43.648198	-79.379817
22	1	M5N	Central Toronto	Roselawn	43.711695	-79.416936
23	0	M5P	Central Toronto	Forest Hill North & West, Forest Hill Road Park	43.696948	-79.411307
24	0	M5R	Central Toronto	The Annex, North Midtown, Yorkville	43.672710	-79.405678
25	0	M5S	Downtown Toronto	University of Toronto, Harbord	43.662696	-79.400049
26	0	M5T	Downtown Toronto	Kensington Market, Chinatown, Grange Park	43.653206	-79.400049
27	0	M5V	Downtown Toronto	CN Tower, King and Spadina, Railway Lands, Har...	43.628947	-79.394420
28	0	M5W	Downtown Toronto	Stn A PO Boxes	43.646435	-79.374846
29	0	M5X	Downtown Toronto	First Canadian Place, Underground city	43.648429	-79.382280
30	0	M6G	Downtown Toronto	Christie	43.669542	-79.422564
31	0	M6H	West Toronto	Dufferin, Dovercourt Village	43.669005	-79.442259
32	0	M6J	West Toronto	Little Portugal, Trinity	43.647927	-79.419750
33	0	M6K	West Toronto	Brockton, Parkdale Village, Exhibition Place	43.636847	-79.428191
34	0	M6P	West Toronto	High Park, The Junction South	43.661608	-79.464763
35	0	M6R	West Toronto	Parkdale, Roncesvalles	43.648960	-79.456325
36	0	M6S	West Toronto	Runnymede, Swansea	43.651571	-79.484450
37	0	M7A	Downtown Toronto	Queen's Park, Ontario Provincial Government	43.662301	-79.389494
38	0	M7Y	East Toronto	Business reply mail Processing Centre, South C...	43.662744	-79.321558

9. Result
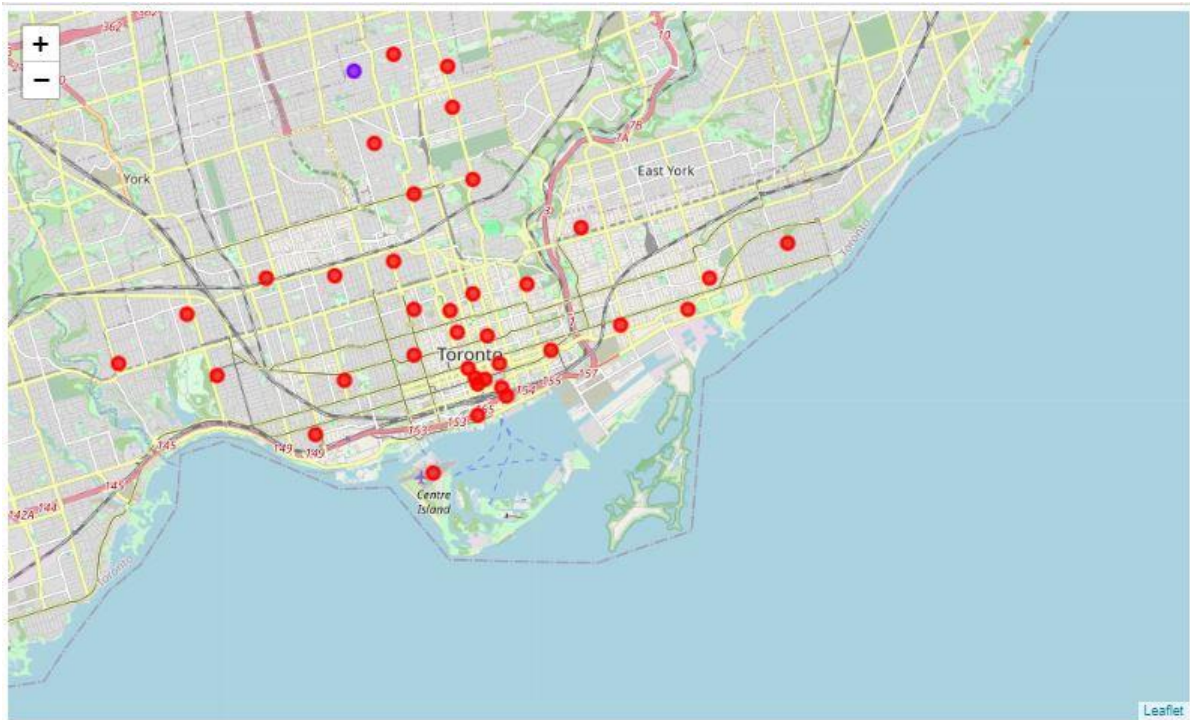
Results

From the above analysis, residential area will be 0 cluster and business area will be 2 cluster

Discussion

Availability of data can be more sufficient and reliable. Even the modelling can be done more efficiently

Conclusion

The above project will be the basic prototype for the identification of areas.