

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 |

DATA AND METHODOLOGY

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 |

DATA AND METHODOLOGY

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 |

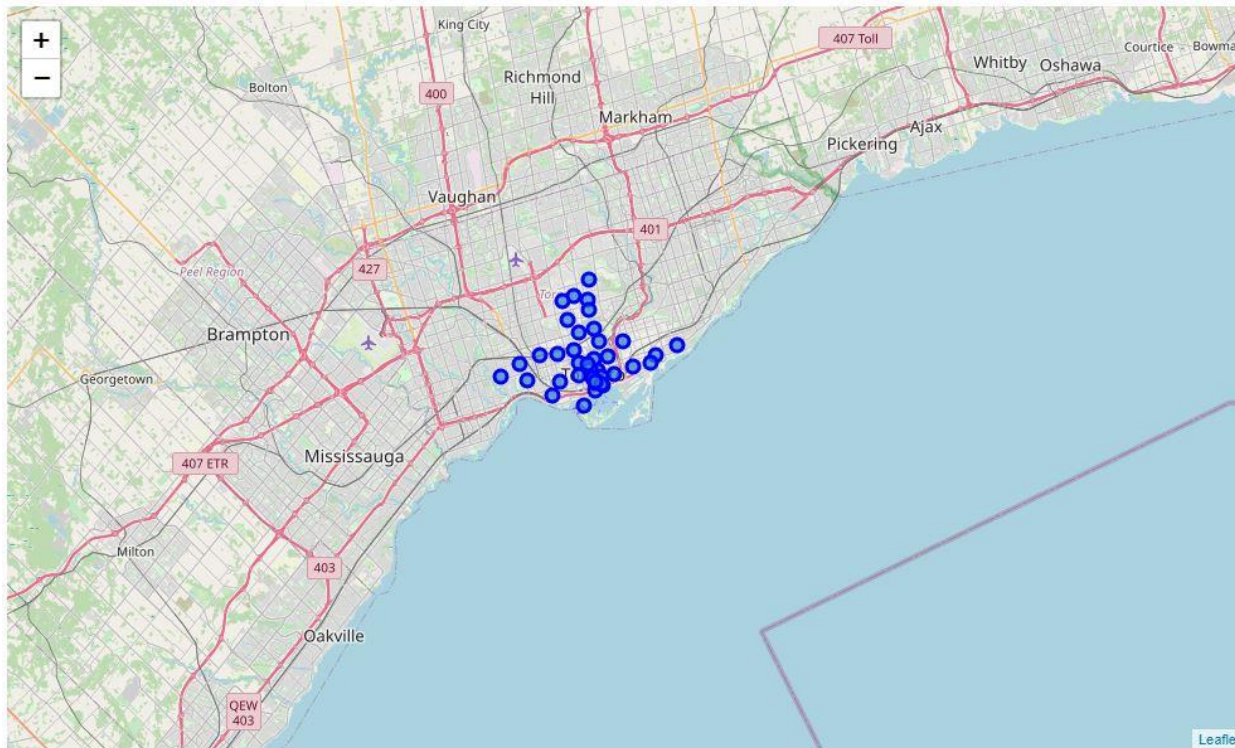
DATA AND METHODOLOGY

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 |

DATA AND METHODOLOGY

5. Plotting of the base data's



DATA AND METHODOLOGY

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 |

DATA AND METHODOLOGY

7. After cleaning the data

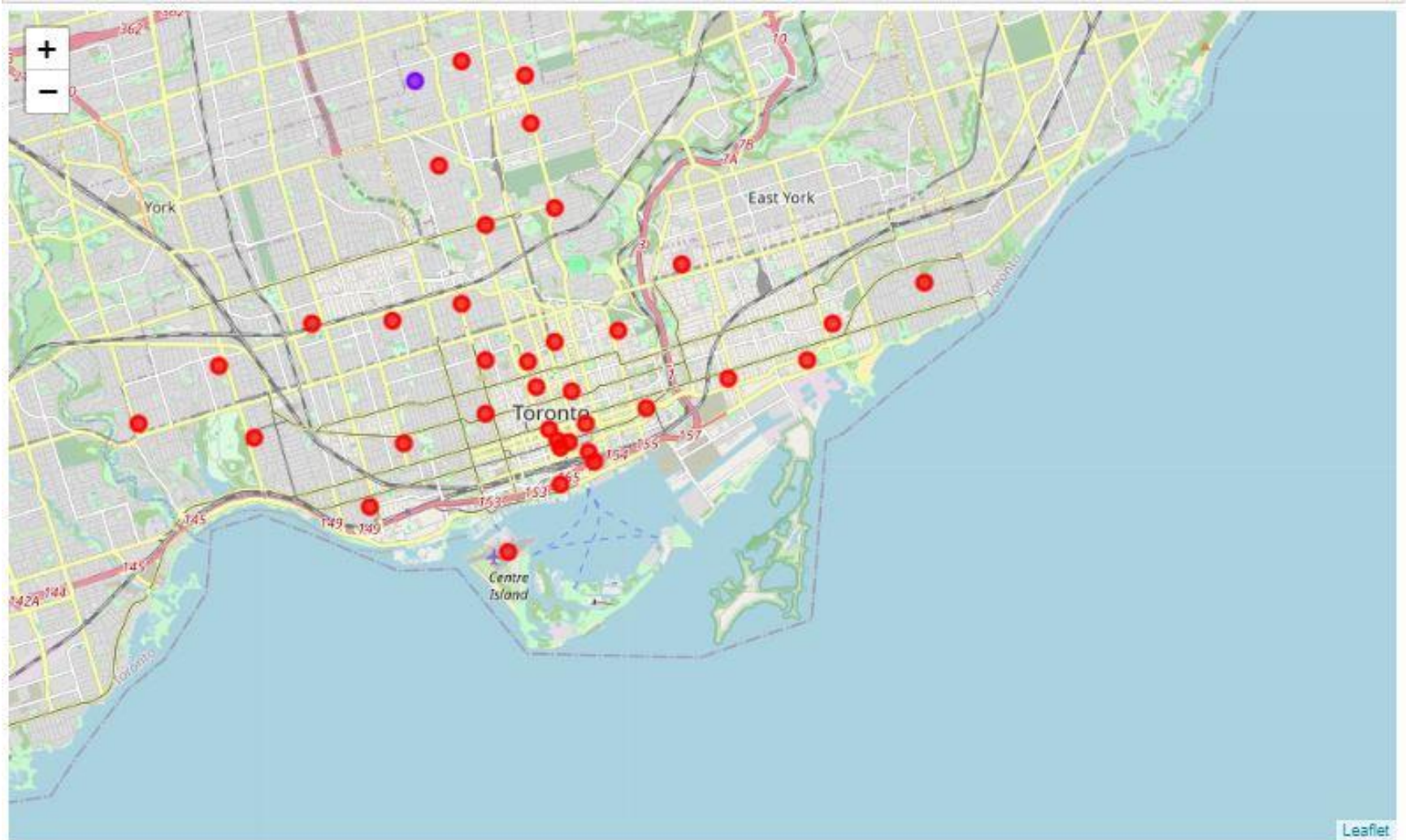
| | PostalCode | Borough | Neighborhoods | 1st Most Common Venue | 2nd Most Common Venue | 3rd Most Common Venue | 4th Most Common Venue | 5th Most Common Venue | 6th Most Common Venue | 7th Most Common Venue | 8th Most Common Venue | 9th Most Common Venue |
|----|------------|---------------------|---|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|
| 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 | | |

DATA AND METHODOLOGY

8. After K-means clustering

| Cluster Labels | Postcode | 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 | 43.688999 -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 | 43.654280 -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 -79.376817 |
| 22 | 1 | M5N | Central Toronto | Roselawn | 43.711695 -79.410936 |
| 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 APO 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 | Brookton, Parkdale Village, Exhibition Place | 43.636847 -79.428191 |
| 34 | 0 | M6P | West Toronto | High Park, The Junction South | 43.651608 -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 |

RESULT



RESULT / DISCUSSION / CONCLUSION

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.