COURSERA-IBM Capstone Project
For IBM Applied Capstone

Predicting neighborhood area living depending on people's criterias

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Chosing right living neighborhoods is capital

➤ Usually people want to live or rent a house in a place that corresponds to their needs, their hobbies, the location of the house,etc....

➤ It can be very hard to find a neighborhood that fits your needs and hobbies, specially with a mixed cultural city like Toronto,

➤ Choosing the right neighborhood can help real estate agencies to propose better houses corresponding to different customer needs,avoiding multiple days of search, and waste of time looking the right house.

Datas acquisition and cleaning

➤ Scrapped datas from wikipedia with Neighborhoods, Boroughs and postal codes with 103 rows and 3 columns

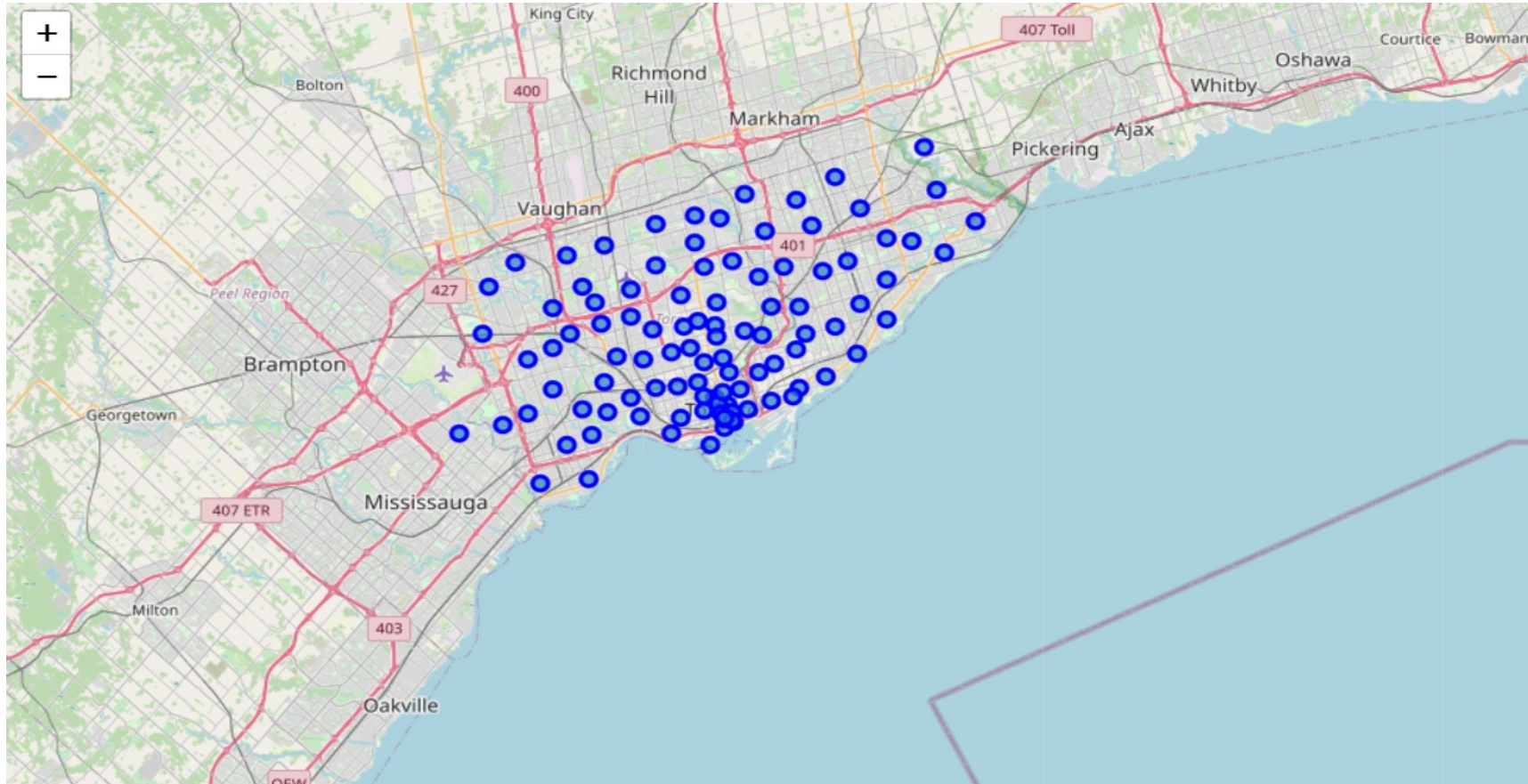https://en.wikipedia.org/wiki/List_of_postal_codes_of_Canada:_M

➤ Geospatial coordinates in csv format containing longitudes and latitudes and postal codes

➤ Foursquare API datas removed with ID acquired from Foursquare account

➤ Merging of all datas had been made and joins on datas had been made also

File with parameters to process

[11]:

	Postal Code	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
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

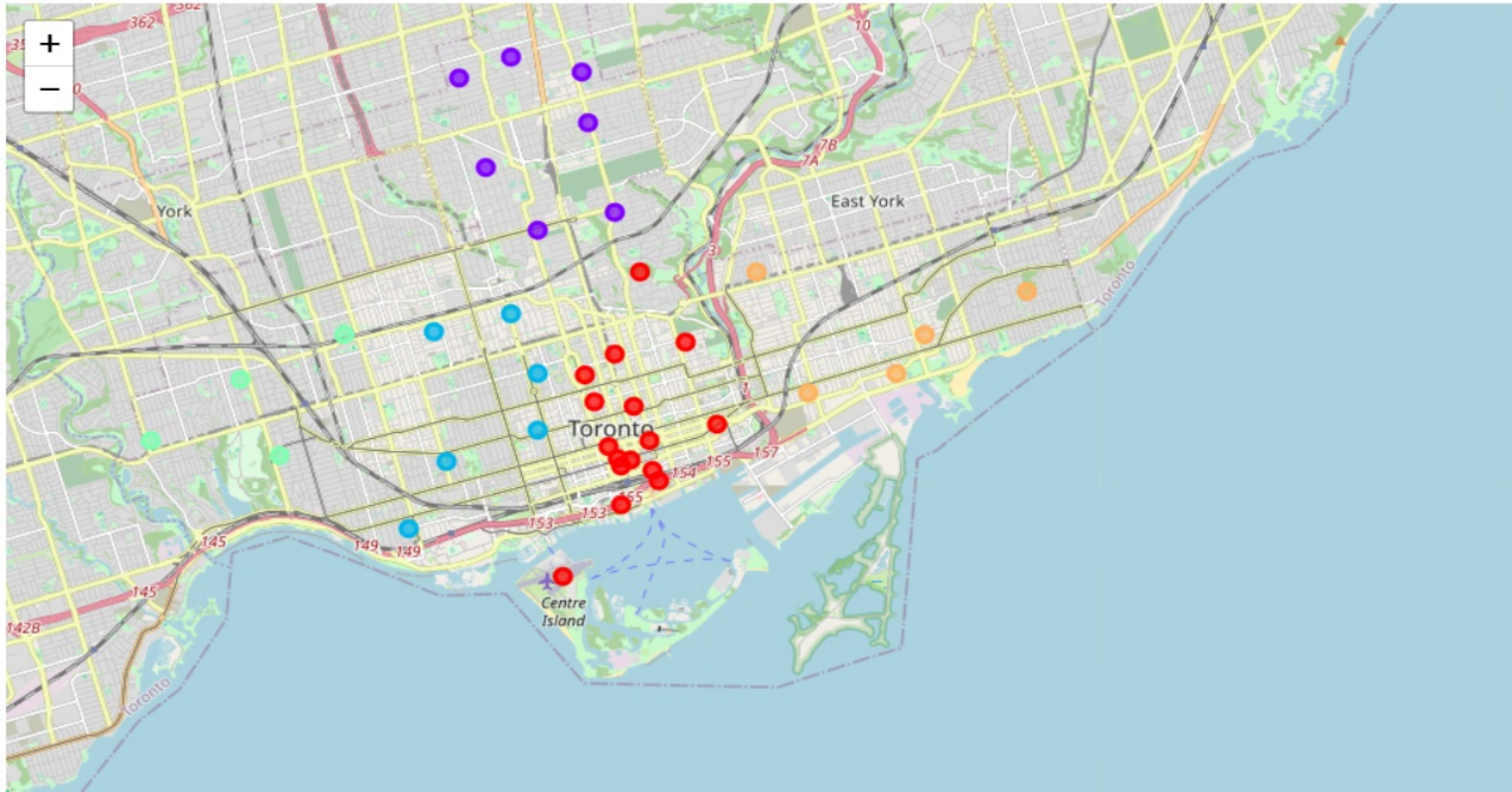# Toronto map with all neighboorhoods

Machine Learning Clustering and results

- K-means clustering had been used to cluster neighborhoods in 5 areas

- Clustering had been made with Borough that contains the name ''Toronto'', with a total of 20 rows and 5 columns

- K-mean cluster gave us 5 clusters with 2 differenciated one

- Cluster 0 has mainly coffees and sushi restaurants

- Cluster3 has mainly varied restaurants(chinese, greek, italians,etc..) and hotels

- folium was used to visualize the clusters

Files with venues from foursquare

	Borough	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	10th Most Common Venue
0	Central Toronto	Coffee Shop	Sandwich Place	Pizza Place	Café	Park	Sushi Restaurant	Dessert Shop	Restaurant	Clothing Store	Pharmacy
1	Downtown Toronto	Coffee Shop	Café	Restaurant	Hotel	Japanese Restaurant	Italian Restaurant	Park	Bakery	Seafood Restaurant	Gym
2	East Toronto	Greek Restaurant	Coffee Shop	Brewery	Italian Restaurant	Ice Cream Shop	Park	Pub	American Restaurant	Bakery	Bookstore
3	East York	Coffee Shop	Bank	Sandwich Place	Park	Burger Joint	Sporting Goods Shop	Pizza Place	Pharmacy	Intersection	Grocery Store
4	Etobicoke	Pizza Place	Sandwich Place	Gym	Coffee Shop	Grocery Store	Fast Food Restaurant	Pharmacy	Park	Discount Store	Café
5	Mississauga	Coffee Shop	Hotel	Sandwich Place	Gym	Fried Chicken Joint	Intersection	Mediterranean Restaurant	Middle Eastern Restaurant	American Restaurant	Gas Station
6	North York	Coffee Shop	Clothing Store	Restaurant	Pizza Place	Japanese Restaurant	Bank	Sandwich Place	Park	Shopping Mall	Grocery Store

Map clusters

Cluster 0

	Borough	ClusterLabels	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	10th Most Common Venue
61	Central Toronto	0	Coffee Shop	Sandwich Place	Pizza Place	Café	Park	Sushi Restaurant	Dessert Shop	Restaurant	Clothing Store	Pharmacy
62	Central Toronto	0	Coffee Shop	Sandwich Place	Pizza Place	Café	Park	Sushi Restaurant	Dessert Shop	Restaurant	Clothing Store	Pharmacy
67	Central Toronto	0	Coffee Shop	Sandwich Place	Pizza Place	Café	Park	Sushi Restaurant	Dessert Shop	Restaurant	Clothing Store	Pharmacy
68	Central Toronto	0	Coffee Shop	Sandwich Place	Pizza Place	Café	Park	Sushi Restaurant	Dessert Shop	Restaurant	Clothing Store	Pharmacy
73	Central Toronto	0	Coffee Shop	Sandwich Place	Pizza Place	Café	Park	Sushi Restaurant	Dessert Shop	Restaurant	Clothing Store	Pharmacy
74	Central Toronto	0	Coffee Shop	Sandwich Place	Pizza Place	Café	Park	Sushi Restaurant	Dessert Shop	Restaurant	Clothing Store	Pharmacy
79	Central Toronto	0	Coffee Shop	Sandwich Place	Pizza Place	Café	Park	Sushi Restaurant	Dessert Shop	Restaurant	Clothing Store	Pharmacy
83	Central Toronto	0	Coffee Shop	Sandwich Place	Pizza Place	Café	Park	Sushi Restaurant	Dessert Shop	Restaurant	Clothing Store	Pharmacy
86	Central Toronto	0	Coffee Shop	Sandwich Place	Pizza Place	Café	Park	Sushi Restaurant	Dessert Shop	Restaurant	Clothing Store	Pharmacy

Cluster 3

	Borough	ClusterLabels	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	10th Most Common Venue
2	Downtown Toronto	3	Coffee Shop	Café	Restaurant	Hotel	Japanese Restaurant	Italian Restaurant	Park	Bakery	Seafood Restaurant	Gym
4	Downtown Toronto	3	Coffee Shop	Café	Restaurant	Hotel	Japanese Restaurant	Italian Restaurant	Park	Bakery	Seafood Restaurant	Gym
9	Downtown Toronto	3	Coffee Shop	Café	Restaurant	Hotel	Japanese Restaurant	Italian Restaurant	Park	Bakery	Seafood Restaurant	Gym
15	Downtown Toronto	3	Coffee Shop	Café	Restaurant	Hotel	Japanese Restaurant	Italian Restaurant	Park	Bakery	Seafood Restaurant	Gym
19	East Toronto	3	Greek Restaurant	Coffee Shop	Brewery	Italian Restaurant	Ice Cream Shop	Park	Pub	American Restaurant	Bakery	Bookstore
20	Downtown Toronto	3	Coffee Shop	Café	Restaurant	Hotel	Japanese Restaurant	Italian Restaurant	Park	Bakery	Seafood Restaurant	Gym
24	Downtown Toronto	3	Coffee Shop	Café	Restaurant	Hotel	Japanese Restaurant	Italian Restaurant	Park	Bakery	Seafood Restaurant	Gym
25	Downtown Toronto	3	Coffee Shop	Café	Restaurant	Hotel	Japanese Restaurant	Italian Restaurant	Park	Bakery	Seafood Restaurant	Gym
30	Downtown Toronto	3	Coffee Shop	Café	Restaurant	Hotel	Japanese Restaurant	Italian Restaurant	Park	Bakery	Seafood Restaurant	Gym
31	West Toronto	3	Café	Bar	Coffee Shop	Italian Restaurant	Restaurant	Bakery	Breakfast Spot	Furniture / Home Store	Gift Shop	Grocery Store

Conclusion

➢ Cluster 0 neighborhood is more likely for citizen who like coffee, sushis, and some fast food

➢ Cluster3 is more likely for citizen who like diversified culture with restaurants from different countries, mixed population there maybe

➢ Cluster 0 and cluster 3 appeared to bé in the center town, regarding the density of shops, or near by a commercial area

➢ For citizen who want peacefull areas, then the remaining clusters might bé the best fit