

USING MACHINE LEARNING TO FIND LOCATIONS TO OPEN A BAKERY IN TORONTO

SUBMITTED BY MEENU CHOUDHARY

JUNE 3, 2020

BUSINESS PROBLEM

Which location is the most suitable for opening a bakery by an entrepreneur looking for business opportunity or existing bakery owner looking for expansion?

Target Audience

The entrepreneur who is looking for business opportunity or the existing bakery owner who wants to expand to new location.

DATA USED

- List of neighborhoods in Toronto, Canada.
- Latitude and Longitude of these neighborhoods.
- Venue data related to Bakery. This will help us find the neighborhoods that are most suitable to open a Bakery.

Extracting the data

- Scrapping of Toronto neighborhoods via Wikipedia.
- Getting Latitude and Longitude data of these neighborhoods via Geocoder package or using a csv file.
- Using Foursquare API to get a venue data related to these neighborhoods.

METHODOLOGY

- Data Collection
- Data Cleaning
- Date Merging
- Machine learning algorithm – K-means Clustering
- Data Visualization
- Data Analysis & Evaluation
- Conclusion & Discussion

DATA COLLECTION

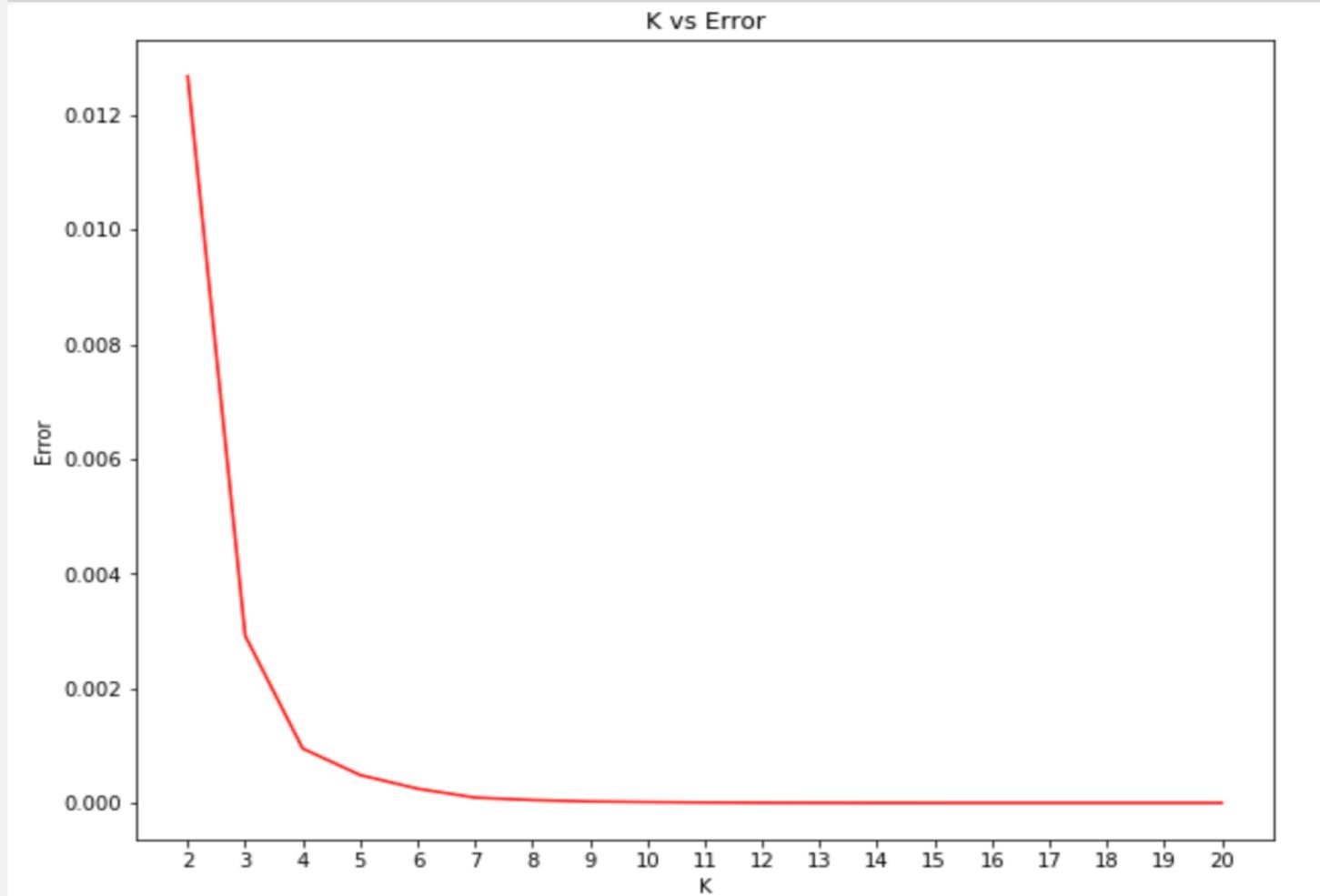
	Postalcode	Borough	Neighborhood	Latitude	Longitude
0	M1B	Scarborough	Malvern, Rouge	43.806686	-79.194353
1	M1C	Scarborough	Rouge Hill, Port Union, Highland Creek	43.784535	-79.160497
2	M1E	Scarborough	Guildwood, Morningside, West Hill	43.763573	-79.188711
3	M1G	Scarborough	Woburn	43.770992	-79.216917
4	M1H	Scarborough	Cedarbrae	43.773136	-79.239476

VENUE DATA

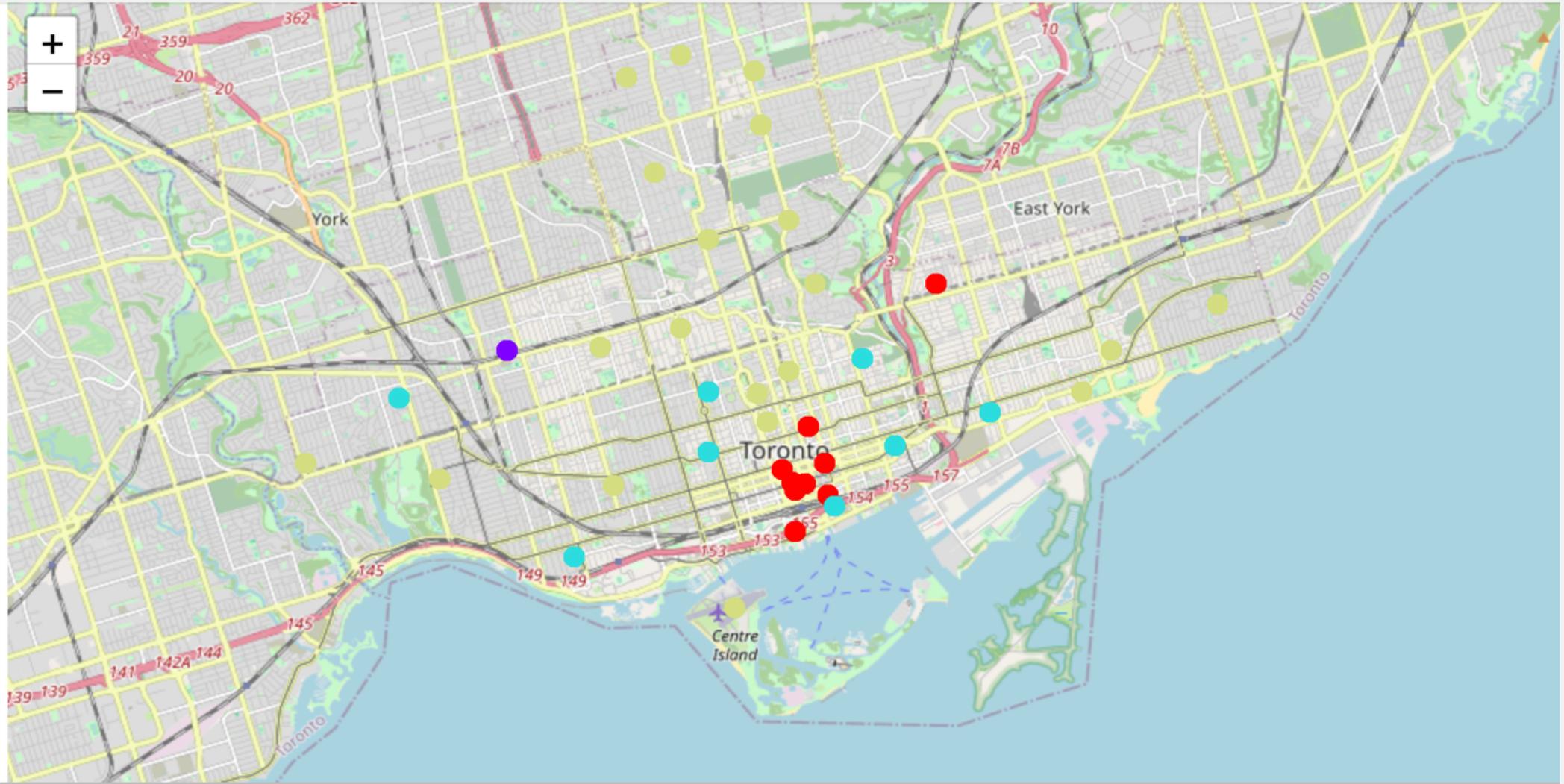
	Neighborhood	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue	Venue Category
	Neighborhood							
	Berczy Park	56	56	56	56	56	56	56
	Brockton, Parkdale Village, Exhibition Place	22	22	22	22	22	22	22
Business reply mail Processing Centre, South Central Letter Processing Plant Toronto		16	16	16	16	16	16	16
CN Tower, King and Spadina, Railway Lands, Harbourfront West, Bathurst Quay, South Niagara, Island airport		17	17	17	17	17	17	17
	Central Bay Street	65	65	65	65	65	65	65
	Christie	17	17	17	17	17	17	17
	Church and Wellesley	78	78	78	78	78	78	78
	Commerce Court, Victoria Hotel	100	100	100	100	100	100	100
	Davisville	32	32	32	32	32	32	32
	Davisville North	9	9	9	9	9	9	9
	Dufferin, Dovercourt Village	13	13	13	13	13	13	13
	First Canadian Place, Underground city	100	100	100	100	100	100	100
	Forest Hill North & West, Forest Hill Road Park	4	4	4	4	4	4	4
	Garden District, Ryerson	100	100	100	100	100	100	100

MACHINE LEARNING ALGORITHM – K-MEANS CLUSTERING

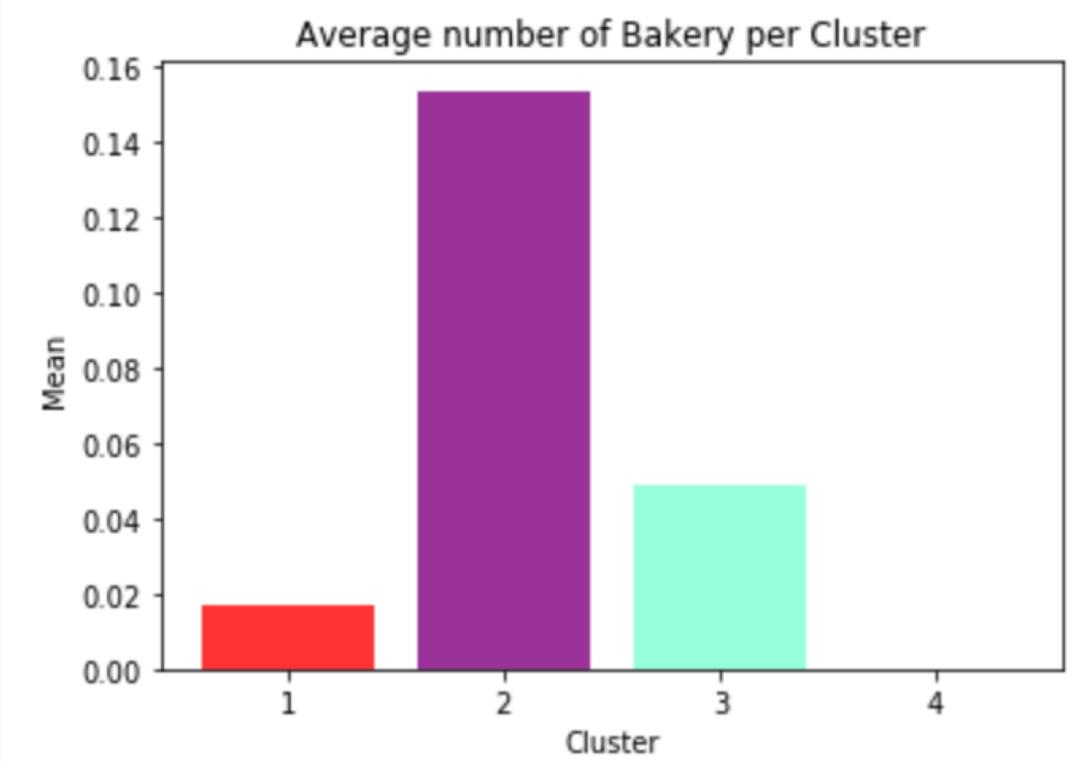
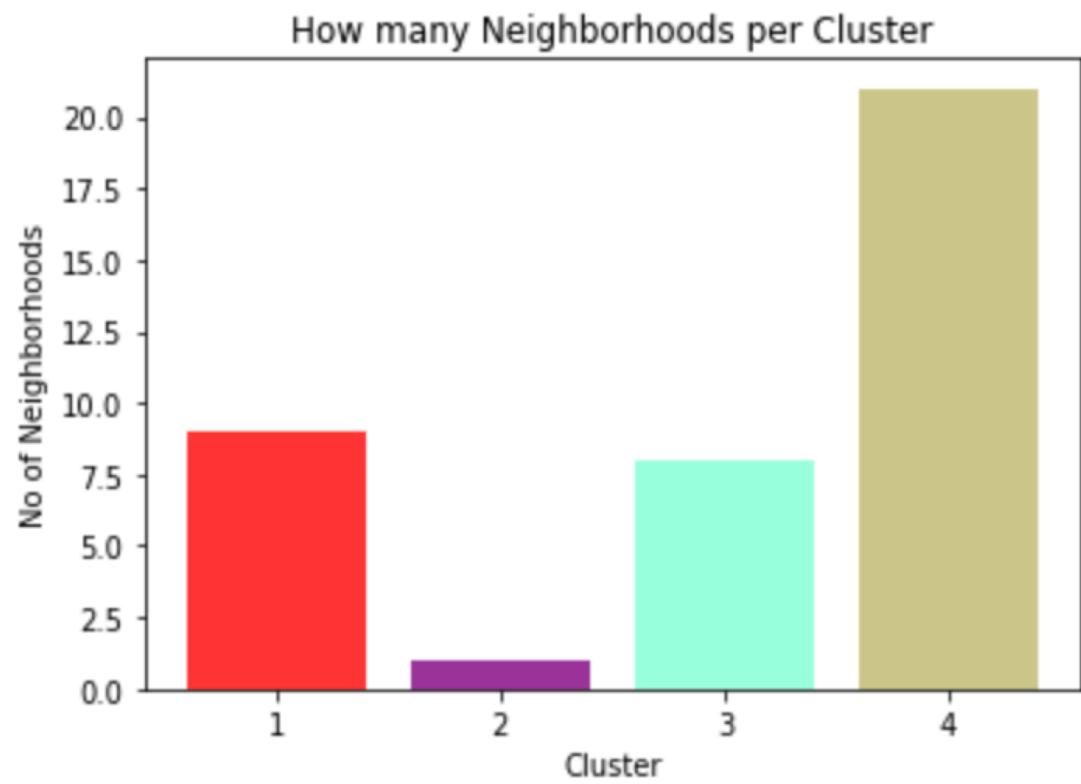
Elbow value of K is 4



CLUSTERS MAP VISUALIZATION



ANALYSIS



RECOMMENDATIONS

There is no bakery in cluster 4 where there are highest number of neighborhood.

The entrepreneur or the existing bakery owner can open a bakery in these locations where there is no competition.