

# APPLIED DATA SCIENCE\_CAPSTONE: BATTLE OF NEIGHBORHOODS

Applied Data Science Capstone Project

January 18, 2020

## GOAL OF STUDY

The goal of this study is to help a group of investors (Food 4 Soul Investors Club) who are looking to open a restaurant in Toronto to use income and population data about each neighborhood to inform their decision. This is a data-driven decision by a group of business speculators will help them identify the best location for the restaurant.

# DATA

## ➤ Sources Employed:

- Toronto's 2016 Census Data (i.e., population, average income per neighborhood)  
Toronto's Open Data Catalogue (neighborhood profiles, 2016, csv file)
- City Government Shapefile for Toronto Neighborhoods
- Foursquare (to identify potential restaurant locations and restaurants in region)
- ArcGis.com Toronto Population Density Map

## EXPLORATORY DATA ANALYSIS (METHODOLOGY)

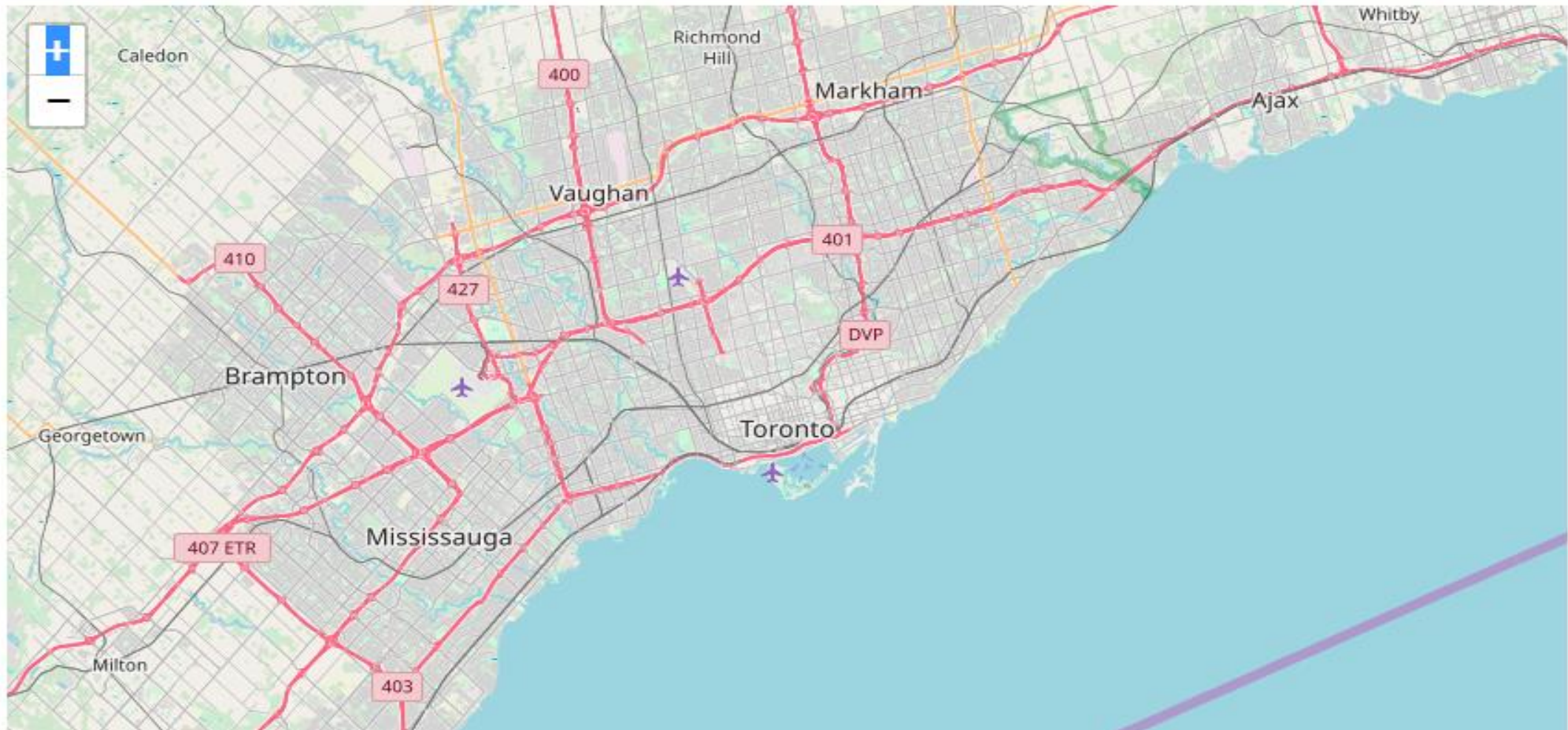
- ❑ Used Lat./Long. Information to generate maps (Toronto, locations, etc.) to help identify points of interest, key sites
- ❑ Foursquare data was used to show restaurants in the area and Toronto's 2016 Census data was employed to identify neighborhoods with differential incomes.
- ❑ Examined postal Toronto's postal codes by neighborhood

## METHODOLOGY

1. Generated a Folium map of Toronto to produce a visual of potential restaurant locations
2. Used Toronto's Population Density Choropleth map to compare neighborhoods
3. Foursquare data was used to show restaurants in the area
4. Employed Toronto's 2016 Census data to identify neighborhoods with differential incomes
5. Examined postal codes by neighborhood

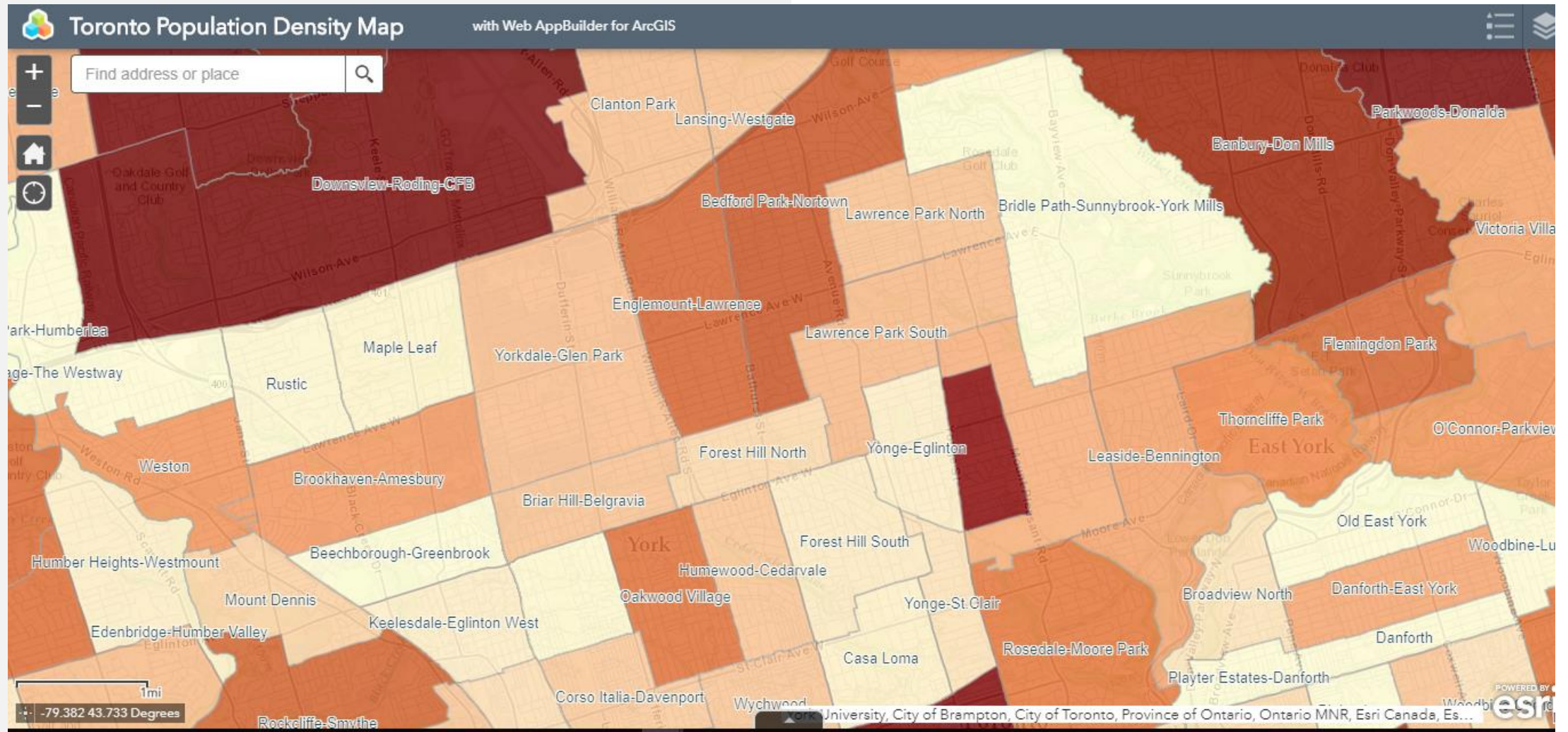
# MAP OF TORONTO

map\_toronto





# ARCGIS.COM TORONTO POPULATION DENSITY MAP (CHOROPLETH MAP)



# TORONTO RESTAURANT COMPETITORS





## 2016 CENSUS DATA

	Category	Topic	Data Source	Characteristic	City of Toronto	Agincourt North	Agincourt South-Malvern West	Alderwood	Annex	Banbury-Don Mills	Bathurst
	Neighbourhood Information	Neighbourhood Information	City of Toronto	Neighbourhood Number	NaN	129	128	20	95	42	
1	Neighbourhood Information	Neighbourhood Information	City of Toronto	TSNS2020 Designation	NaN	No Designation	No Designation	No Designation	No Designation	No Designation	No Designation
2	Population	Population and dwellings	Census Profile 98-316-X2016001	Population, 2016	2,731,571	29,113	23,757	12,054	30,526	27,695	1
3	Population	Population and dwellings	Census Profile 98-316-X2016001	Population, 2011	2,615,060	30,279	21,988	11,904	29,177	26,918	1
4	Population	Population and dwellings	Census Profile 98-316-X2016001	Population Change 2011-2016	4.50%	-3.90%	8.00%	1.30%	4.60%	2.90%	

POPULATION  
VS. INCOME

	Population_2016	Income_2016
St.Andrew-Windfields	17,812	100,516
Edenbridge-Humber Valley	15,535	101,551
Lawrence Park North	14,607	111,730
Annex	30,526	112,766
Yonge-St.Clair	12,528	114,174
Bedford Park-Nortown	23,236	123,077
Leaside-Bennington	16,828	125,564
Kingsway South	9,271	144,642
Casa Loma	10,968	165,047
Lawrence Park South	15,179	169,203
Forest Hill South	10,732	204,521
Rosedale-Moore Park	20,923	207,903

## RESULTS

The most densely populated areas did not prove to be a reliable source for speculation for a restaurant for the Food 4 Soul Investors Club. As expected, most of the competitor restaurants were concentrated in the downtown area of Toronto in streets frequently accessed by city dwellers (e.g., main and central streets). The more high-income neighborhoods had more competitor restaurants than the more densely populated areas.

Places of interest for the Food 4 Soul Investors Club to consider to share customers for the restaurant included lodging / hotels, banks, coffee shops, shopping centers, landmarks such as museums, government buildings, etc.

## DISCUSSION

This report proved to be helpful for the Food 4 Soul Investors Club as they speculated on potential areas in Toronto for opening up a restaurant. The club was provided with differential data about neighborhood income, population comparisons by neighborhood, restaurant competitor data, and postal code by neighborhood. We cannot conclude that all factors are considered in this report for making an investment decision, yet it is a start for the Food 4 Soul Investors Club.

## CONCLUSION

In this capstone project, I learned that data analysis can be detailed, exhaustive, and on-going for the investigator. It is important to maintain fluid and open communication with the group who seeks the data to make a key business decision (i.e., Food 4 Soul Investors Club). Sometime, there can be assumptions that are confirmed or disprove. For instance, I expected to find more densely populated areas with better restaurant competitors, but this was not the case in my analysis.

I also learned more about how to generate maps using different sources (python, arcgis.com, Foursquare). There is so much more for me to learn!