

Data Science Capstone Project 2021

The Battle of the Neighborhood

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Introduction

Due to the "Lockdown" in 2020, several restaurants closed their doors, with the need to adapt their ways of serving their customers. Two forms of service were established by most restaurants and snack bars: delivery and on-site collection (courtside pick up), as they present the lowest initial investment.

Thus, some entrepreneurs thought of themselves starting the process of delivering products to their customers, within a restricted distance area.

This is an excellent opportunity to create a model that can be suitable for any restaurant that wants this analysis, helping small business owners to adapt their businesses, get to know the competition better, and make a better investment decision in this service (or not). It is time to reinvent themselves!



Business Problem

- Need to Know better your Neighborhood and competition for delivery services.
- How many restaurants are there in the area to offer the analysis?
- What types of restaurants are in this region?
- What is the income of people in the same region to determine the prices to be charged?
- Where is the best area to provide the delivery services with the best return on investment?

Business Problem

The media expose clearly that are needs, as well as space for changes if the small business owners want to survive to the pandemic.

Restaurants in Toronto have been closed for most of the last year

Timeline of closures since the pandemic began in March 2020

Restaurants (indoor dining)



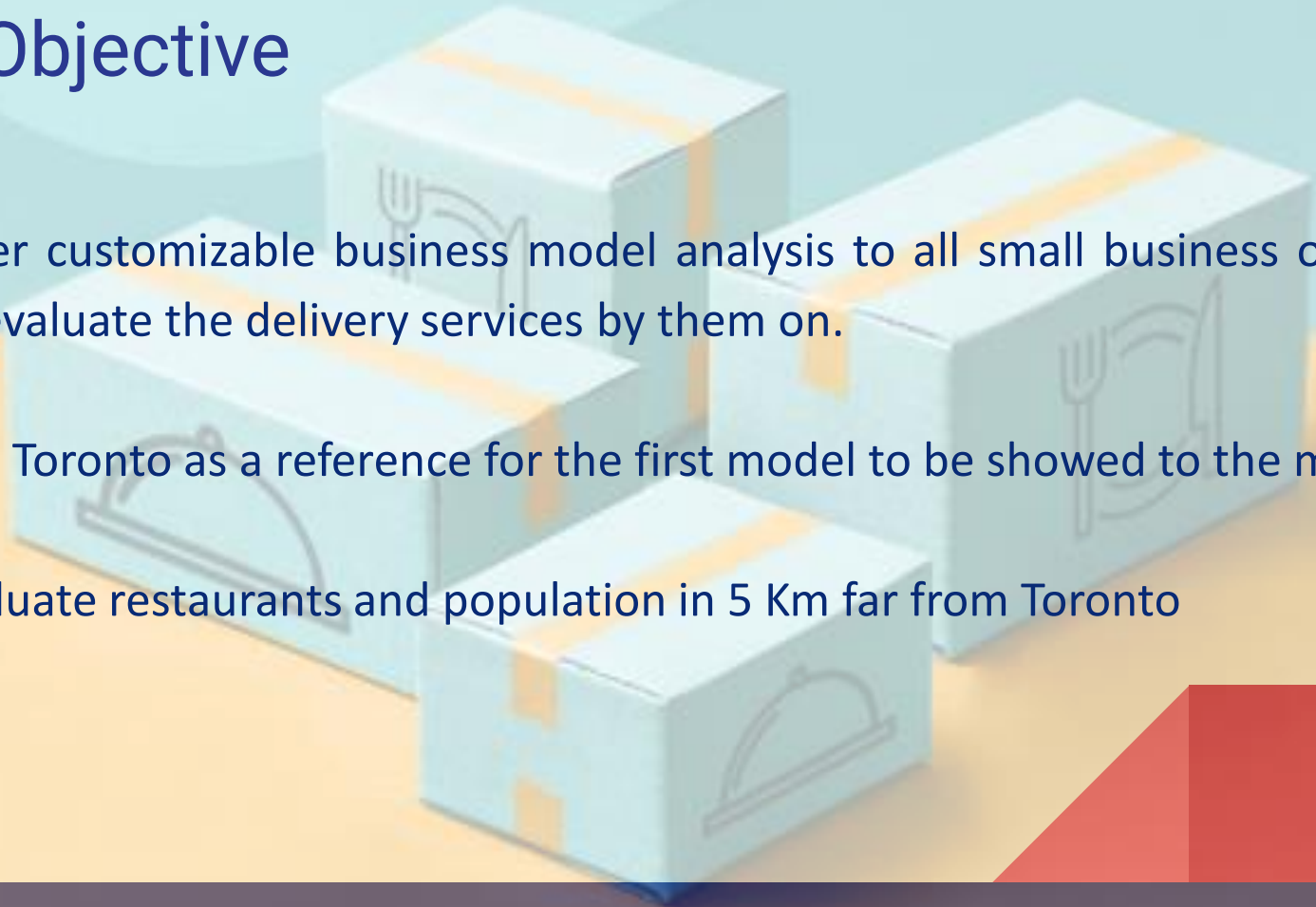
Restaurants (patios)



Source: BBC research

Our Objective

- Offer customizable business model analysis to all small business owners to evaluate the delivery services by them on.
- Use Toronto as a reference for the first model to be showed to the market
- Evaluate restaurants and population in 5 Km far from Toronto



How will we do that?

Using external databases to capture relevant data and evaluate the results.

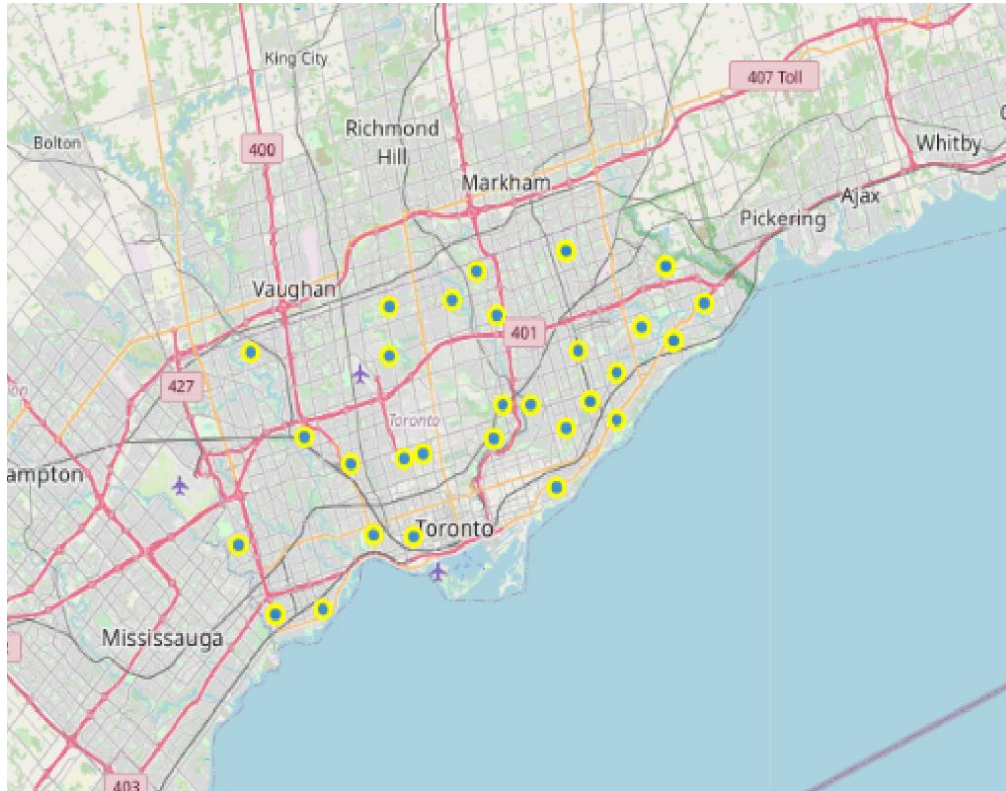
- Number of restaurant per category
- Number of restaurant per neighborhood
- Number of people per neighborhood
- Evaluate the Clustering

Sources/Databases

- Foursquare to find restaurants
- Wellbeing Toronto for Demographic/ socioeconomic
- Wikipedia to find the locations

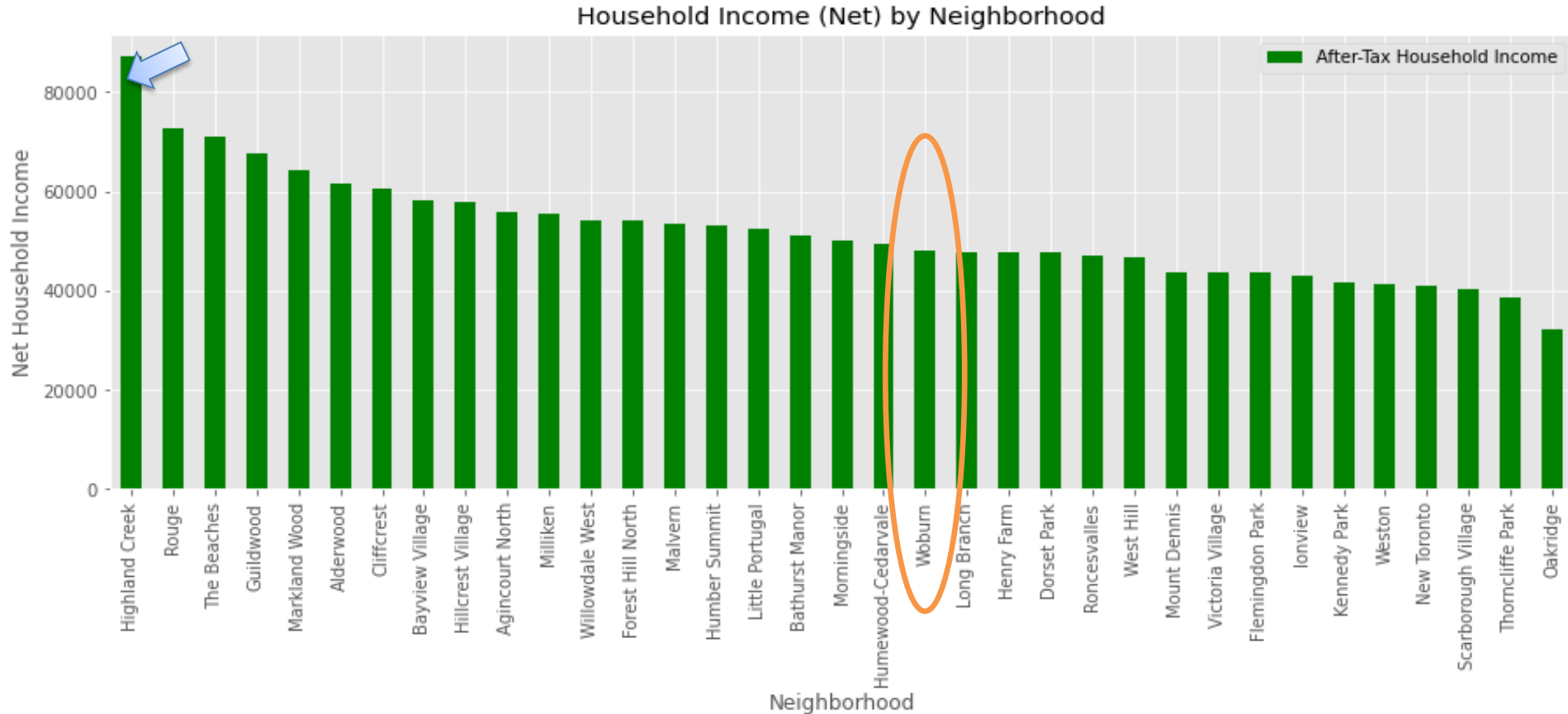


Number of Restaurants

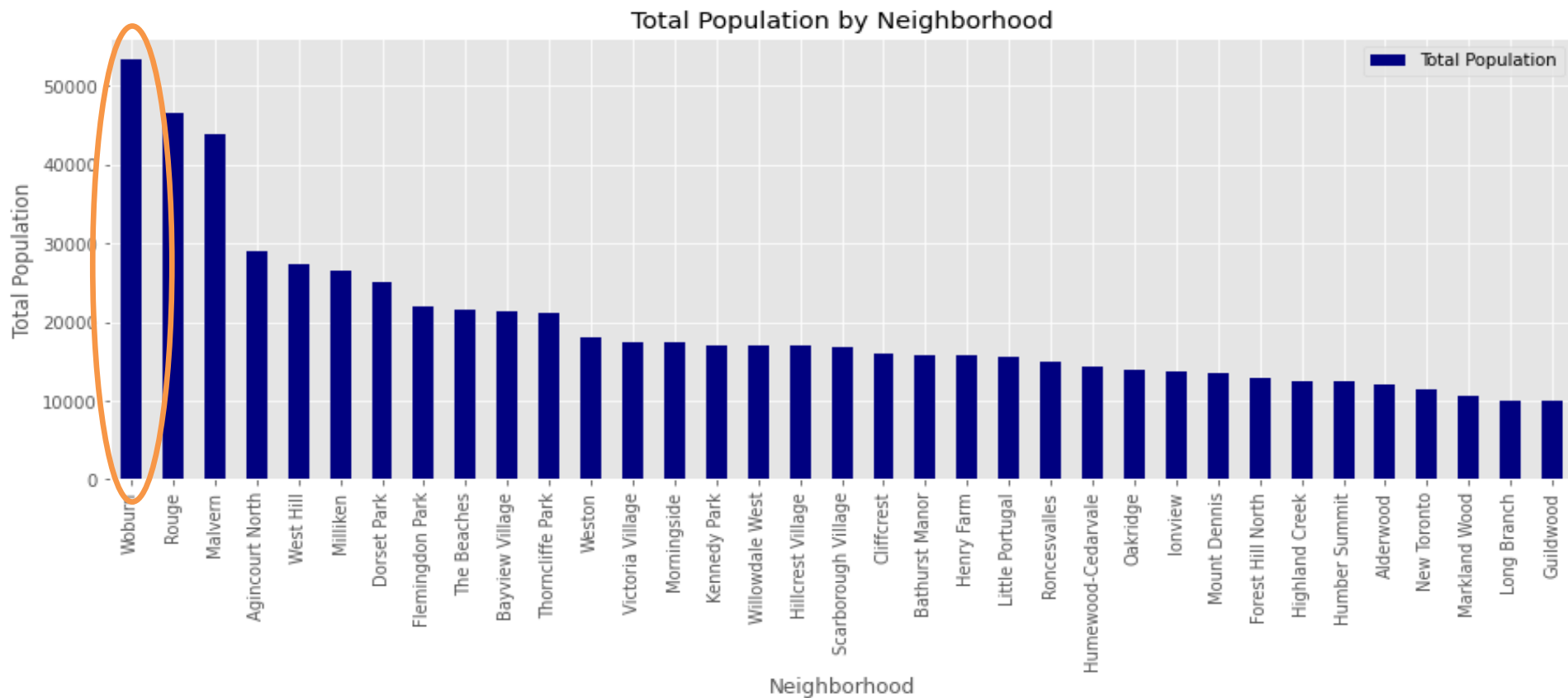


**There are 50 Restaurants,
under 5 Km Range from
Toronto that we can offer
these services**

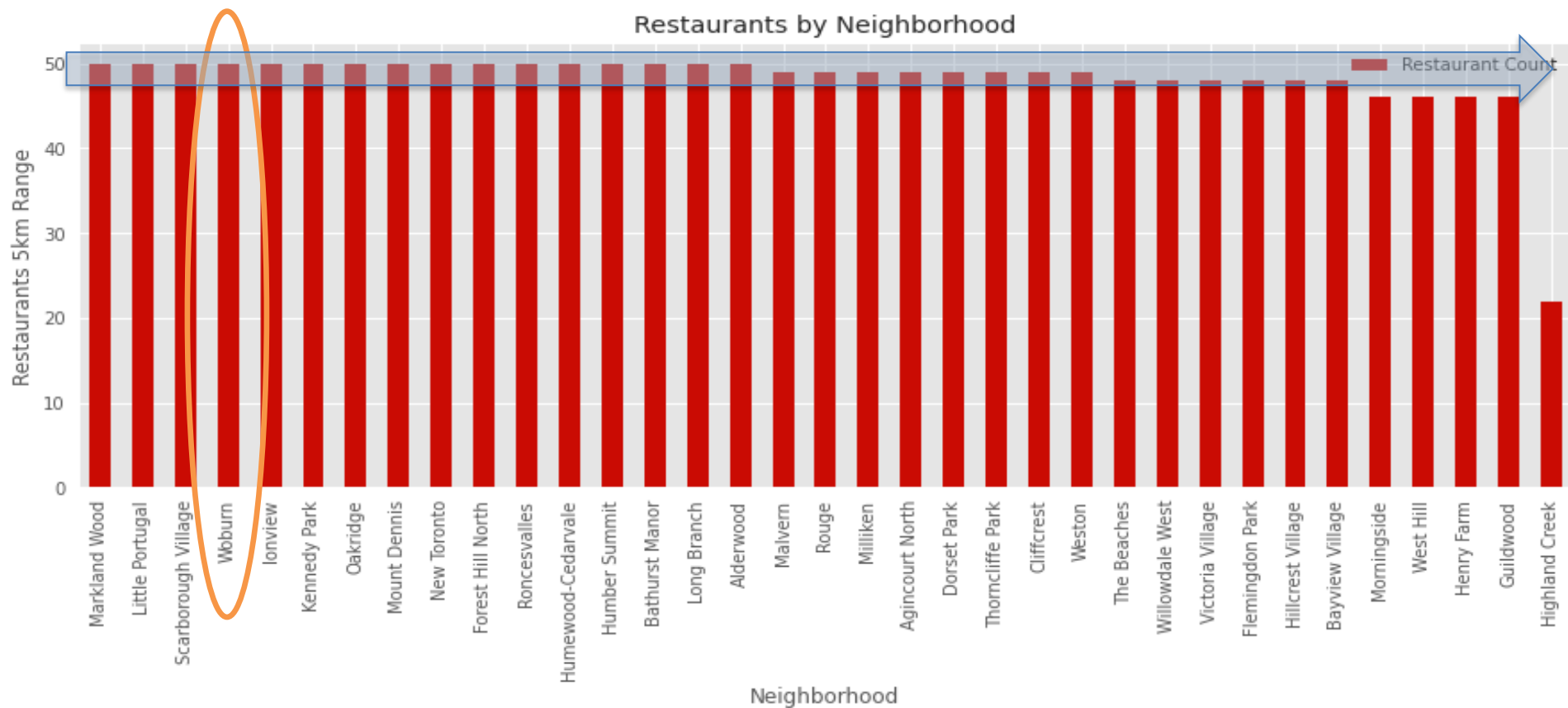
Household Income (Net)



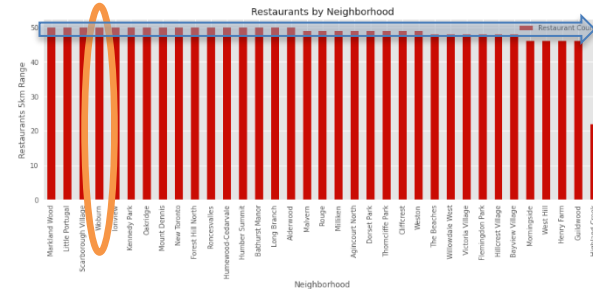
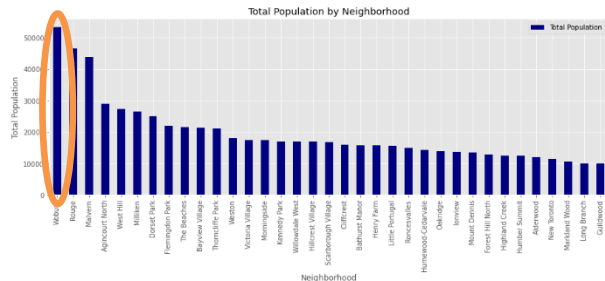
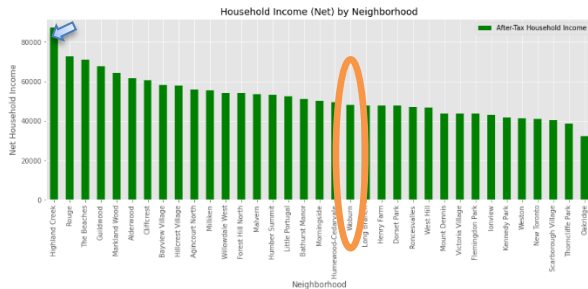
People per neighborhood



Restaurants



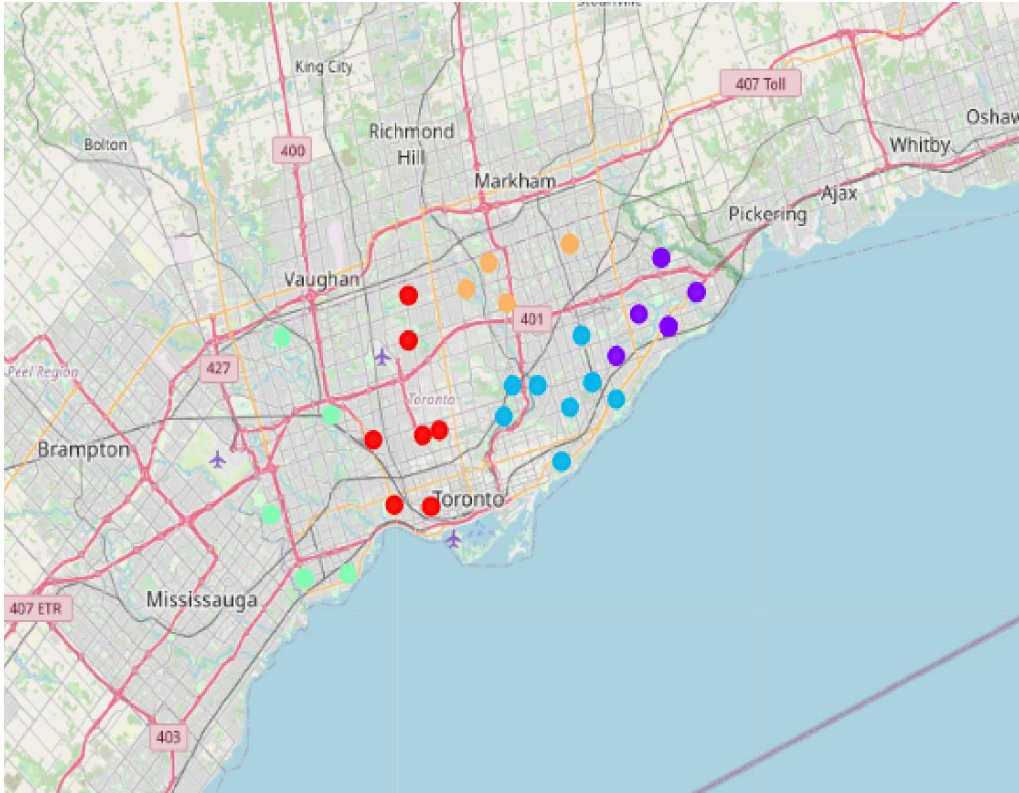
Pre-Evaluation



Woburn shows be the most populated neighborhood, with a good average income per family in the region.

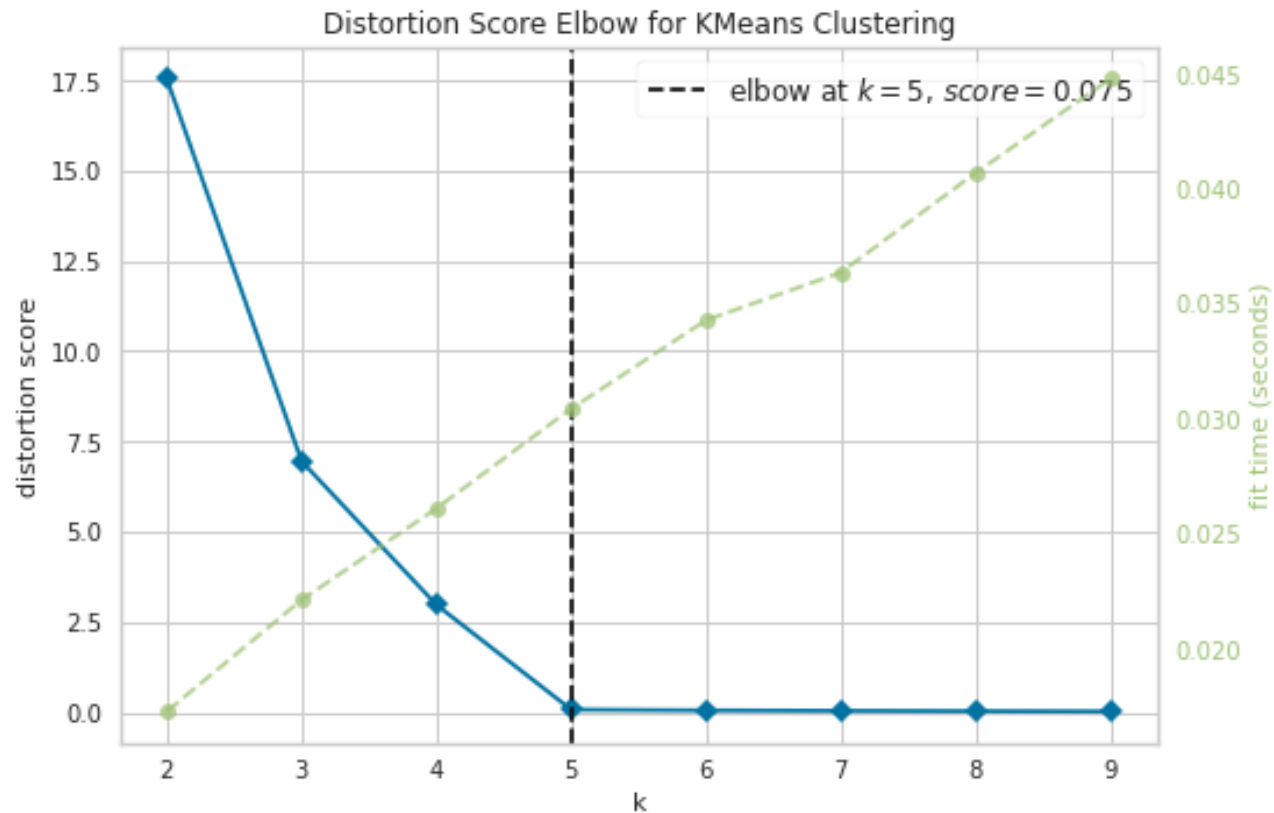
Based on that, we can see that could be the best place to deliver business services.

Map with Clusters



Clustering labels to be used in our analysis

KMeans Cluster Analysis



Cluster Labels	0.000000
After-Tax Household Income	50246.285714
Total Population	14872.285714
Latitude	43.702257
Longitude	-79.439444
Restaurant Count	49.714286

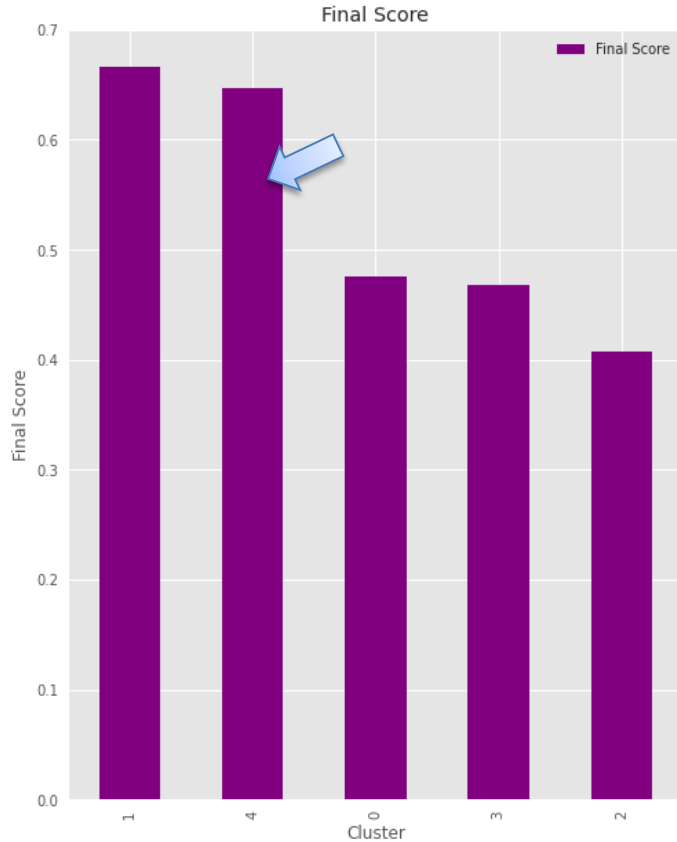
All Clusters labeled

Cluster Labels	After-Tax Household Income		Total Population	Latitude	Longitude	Restaurant Count
0	\$	50,246	14872.286	43.702257	-79.439444	49.714286
1	\$	58,271	28469.625	43.775544	-79.196466	44.75
2	\$	46,855	18629.444	43.719356	-79.291146	49
3	\$	51,478	12427.167	43.652861	-79.541607	49.833333
4	\$	54,945	21947.6	43.799946	-79.333027	48

Here we can start to see the key cluster for our goals



Final Score for the Clusters



Cluster 4 is the best region for us to help the restaurants to implement the new delivery services, followed by cluster 1.

	0	1	2
0	0.29705	0.15242	0.97658
1	1.00000	1.00000	0.00000
2	0.00000	0.38662	0.83607
3	0.40492	0.00000	1.00000
4	0.70866	0.59345	0.63934

Conclusion

- The model is very consistent, and shows be a good customizable tool
- External factors to this analysis can impact the implementation results:
 - Franchises that can operate into the same range
 - Population average age and origin
 - Operations: quality of products, delivery time, fees, etc.)

Suggestions to the small business

- Run marketing on social medias and network
- Owners' resilience for the current and former situation
- Keep attention to the competition
- Don't start a "price" war
- Peep the Customer Experience highest

Conclusion

Forecasting the services

We do not believe that even after the lockdown, the model will become obsolete once the lockdown ends, as people will certainly see the social value of helping small businesses and creating jobs in their regions. Even if people go back to work in offices, we believe that small restaurants can offer this service at a cost differential for the consumer, who is already used to the same service done before.



Thank You !

