Thai Authentic Supermarket on-line in Toronto Proporsal Project

By Hataikan Chiverton

1. Introduction

From wikipedia website, "*Thai_Canadians, census 2016*"[1], saying that there are 19,010 Thai Canadians by ancestry in Canada. Also, 1991 Census shows that there were 5820 immigrants who were born in Thailand. Also, there were more women than men. Cities where many thai people live are Ontario, British Columbia, Quebec and Alberta.

Thai food is very popular in Toronto. Searching by google[2] with key words "*thai restaurant in toronto canada*", there are more than 100 thai restaurants in this area. Also, there are more than 50 chinese supermarkets. Searching for Thai supermarket, surprising there is none! They might be existed, but assumingly not many. In addition, many local people were complaining that they couldnot find some ingredients fro cooking Thai food and some of them complaining that those ingredients were not fresh. Therefore, this is an amazing opportunity for running a Thai Market on-line business in Toronto. On-line seems to be a good option because of budget efficiency and buying on-line is very trendy nowadays. To be more competitive, the price should be lower than those chinese supermarkets.

To run business, there are at least 4 conditions to be considered as following:
1. Distance
   This can save the cost and time of delivery and the place should be in business areas.
2. Competitor
   The price is the key to be successful. On-line sale is considered to be a good solution.
3. Household income
   Data needs to be collected and the target customer details should be discussed.
4. Demographic
   Age, sex should be considered.

Before continuing, there is one interesting report from the pdf file of Toronto Housing Market Analysis - City of Toronto[3] from the website by Canadian Centre for Economic Analysis and Canadian Urban Institute. It has been said much insight information.
For example:
"Toronto's population is expected to grow by 1.03 million people between 2016 and 2041." Population growth has been crowded in the south of Bloor in Downtown, especially in the waterfront communities. Also, there are many people in the west of the Downtown and further west in Etobicoke Sheppard transit corridor. There will be more male than female and around middle age.

The number of visible Minorities (a non-caucasian or non-white) population has increased from 46.9% to 51.5% in 2016. Most of them live in north and east Scarborough and north and north western Etobichoke. Immigrants also live in these similar areas. For married status, there are more married people and family members than those single people. Household mainly has two people. Lone families has been increasing continuously. Finally, it has been said that in the future there will be more low-income households.

Figure1 shows those popular thai restaurants in Toronto by using the map from Foursquare[4]. The results show the total of 90 Thai restaurants.

Figure1 The location of popular thai restaurants in Toronto. Image from Foursquare.com
By searching Chinese or Asian Supermarkets via Google Map[5], there are more than 50 Chinese and Asian supermarkets as shown in Figure2.
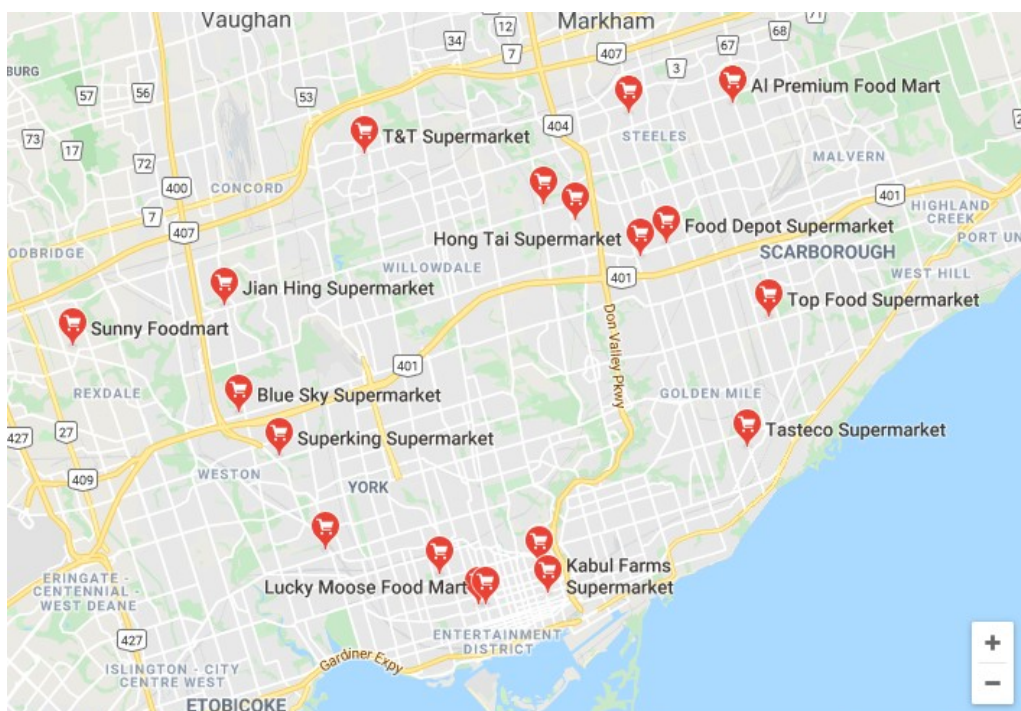

Figure2 Chinese and Asian Supermarkets in Toronto. Image from Google Map.

To be more specific, data from Statistics Canada, Census Profile, 2016 census- Toronto, Ontario, Canada[6] is used. From this website, I found that there are more thai women than men for both Canada population data and Toronto population data.

type	male	female
motherTongue	2690	6565
ethnicOrigin	7330	11680

Table1 Thai population in Canada from 2016 Census

type	male	female
motherTongue	475	1080
ethnicOrigin	1225	2010

Table2 Thai population in Toronta from 2016 Census

From this overview, as the population has been increasing and they will possibly have low income than the average. Parents or lone parents with kids are the main population. More female than male. Therefore, to save their cost of living, they are assumed to cook at home. The price of the product is an important key to set up the business- to gain more customers and lower the price of items.

Plans are:
- gathering data from different websites to get the insight understanding.
- using Foursquare API to find the geographical location.
- using folium to show the map.
- using some statistical approach such as K-Means clustering
- Showing some popular dishes and their ingredients so you can plan to shape your business.

2. Data
From using Postcode in Canada data[7] and then filtering to locations in Toronto only, the locations were plotted as shown in Figure3. FourAPI[8] was used for getting data.
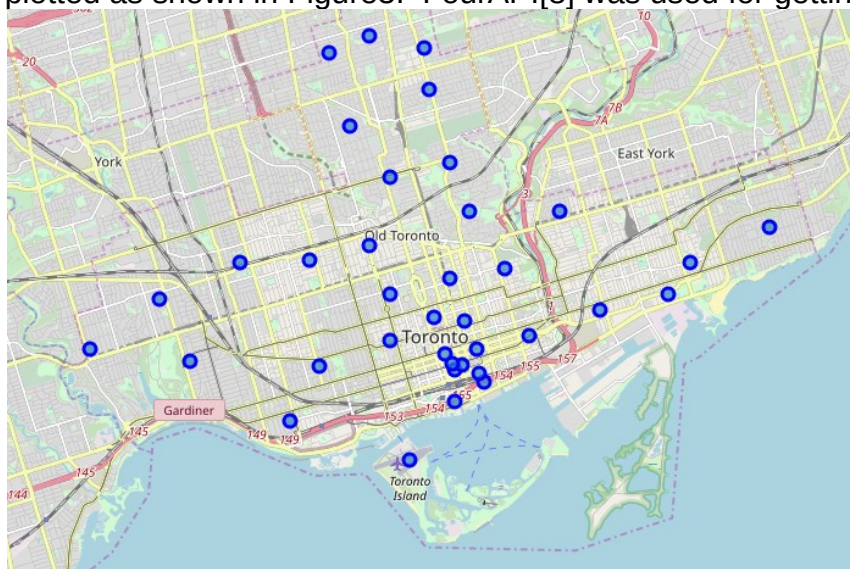

Figure3 Toronto map by using data from Wikipedia website.

This Toronto dataframe has 4 boroughs and 38 neighbourhoods. The geographical coordinate of Toronto are 43.653963, -79.382707. By using geospatial_data.csv, the

latitude and longitudes in Canada were obtained. Then, searching for Thai restaurants in the website Foursquare, Thai restaurant called, 'Sabai Sabai', was chosen. Next, using FoursquareAPI, this will show other venues location near this restaurant. By doing this, it will give the JSON file. Then, filtering only Thai venues and plot the map as shown in Figure 4 below. The red marker is shown the location of Sabai Sabai restaurant and the blue markers are shown the nearby restaurants.
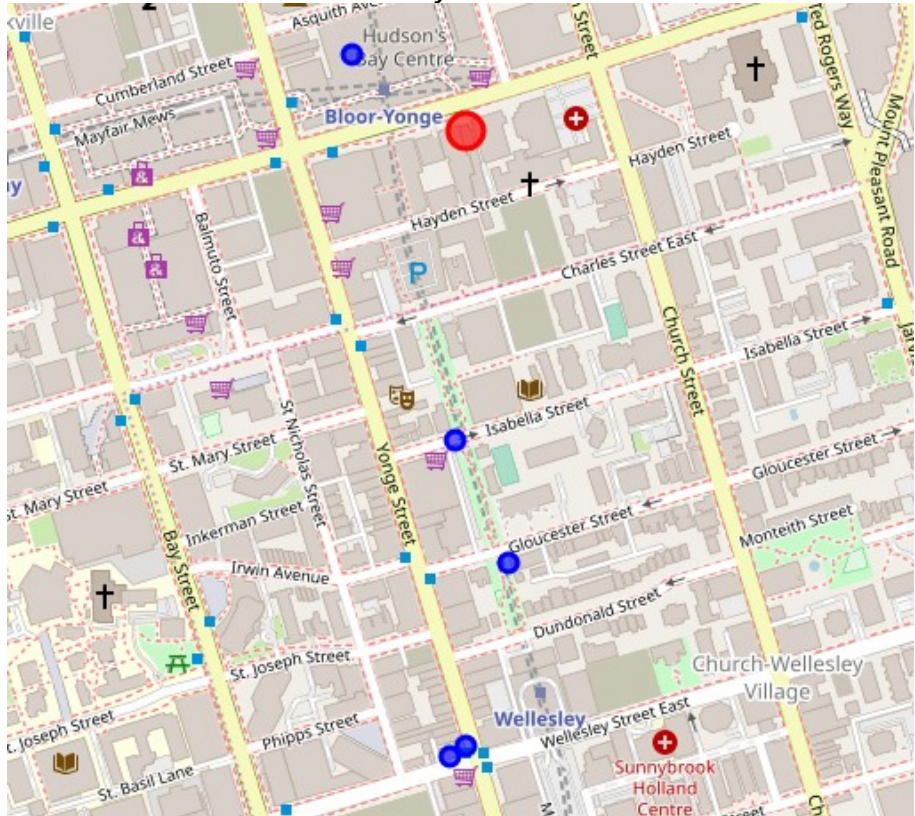
Figure 4   The red marker is Sabai Sabai restaurant and the blues markers are Thai venues nearby. This map was created by using Foursqaure API.
The list of those four Thai restaurants are shown in Figure 5.

	name	categories	address
0	Thai Express	Restaurant	2 Bloor St E,Hudson's Bay Centre
1	Royal Thai Consulate General	Embassy / Consulate	17 Isabella St.
2	thai trade centre	Business Center	31 Gloucester St.
3	Thai Fantasy	Thai Restaurant	578 Yonge St.
4	Chopsticks House 筷活林	Taiwanese Restaurant	NaN

Figure5 Four thai restaurants nearby.

Figure6 below, looking for other shops (not Thai restaurant) near within 500 meters by using Foursqaure API to find their location.

Figure 6 Other venues nearby

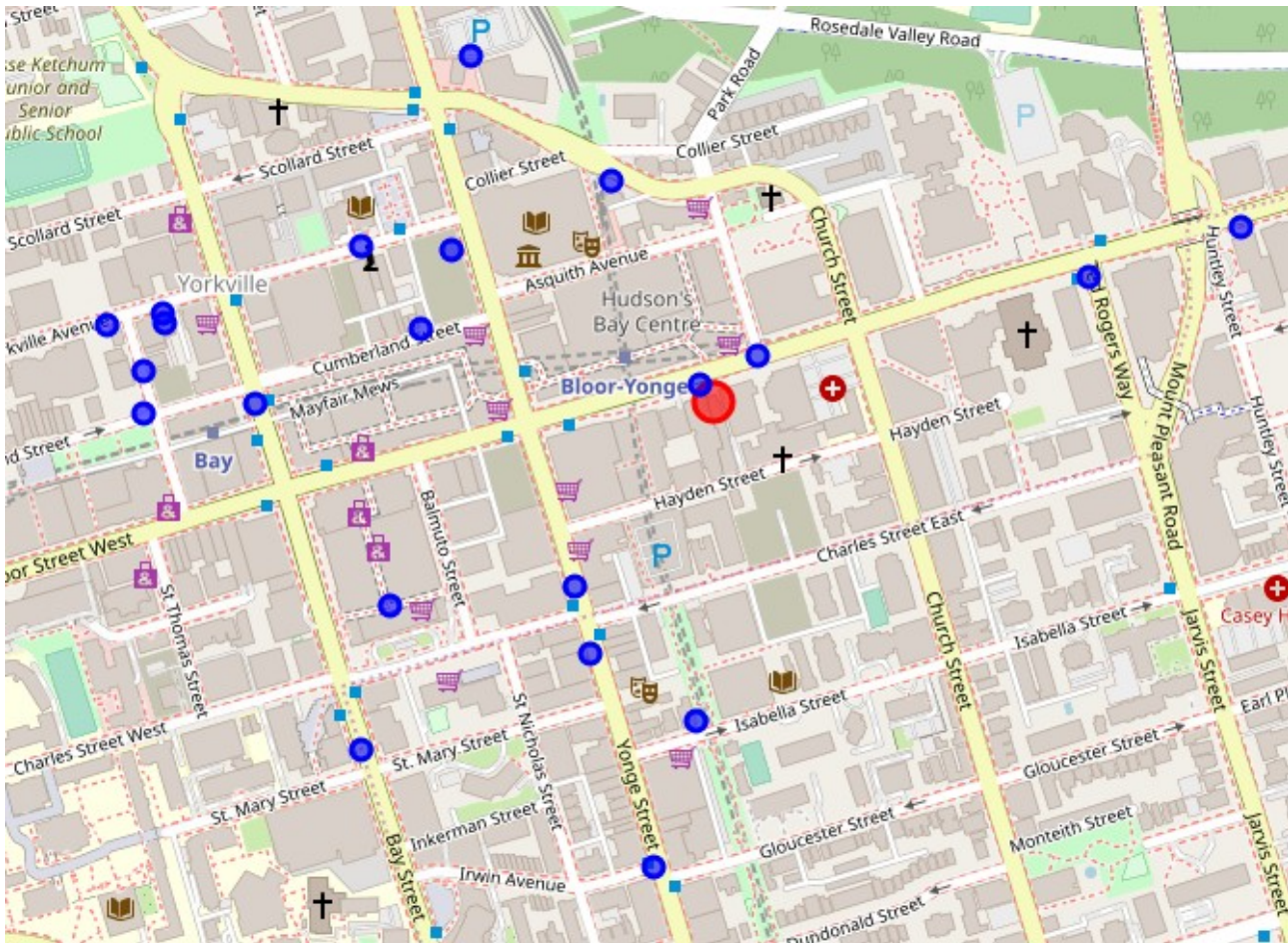This list of those venues are in Figure 7. Total number are 22 venues.

```
                Matisse Restaurant And Bar
Sassafraz | Cafe | Restaurant | Private Events
                         OJA Restaurant
                        Ehwa Restaurant
             Yamato Japanese Restaurant
                    Brothers Restaurant
                   Kathmandu Restaurant
      Natural Sushi Japanese Restaurant
                     Scaccia Restaurant
                      Sorrel Restaurant
                        True Restaurant
                           Sunset Grill
               Nijo Japanese Restaurant
                Coach House Restaurant
                          King's Palace
              Blu Ristorante and Lounge
                Dynasty Chinese Cuisine
                                 Subway
                                 Subway
                                 Subway
                                 Subway
                                 Subway
```

Figure 7 Other restaurants

Some of those 100 venues nearby are as following:

Harbourfront ,Regent Park
Ryerson ,Garden District
St. James Town
The Beaches
Berczy Park
Central Bay Street
Christie
Adelaide ,King ,Richmond
Dovercourt Village ,Dufferin
Harbourfront East ,Toronto Islands ,Union Station
Little Portugal ,Trinity
The Danforth West ,Riverdale
Design Exchange ,Toronto Dominion Centre
Brockton ,Exhibition Place ,Parkdale Village
The Beaches West ,India Bazaar
Commerce Court ,Victoria Hotel
Studio District
Lawrence Park
Roselawn
Davisville North
Forest Hill North ,Forest Hill West
High Park ,The Junction South
North Toronto West
The Annex ,North Midtown ,Yorkville
Parkdale ,Roncesvalles
Davisville
Harbord ,University of Toronto
Runnymede ,Swansea
Moore Park ,Summerhill East
Chinatown ,Grange Park ,Kensington Market
Deer Park ,Forest Hill SE ,Rathnelly ,South Hill ,Summerhill West
CN Tower ,Bathurst Quay ,Island airport ,Harbourfront West ,King and Spadina
,Railway Lands ,South Niagara
Rosedale
Stn A PO Boxes 25 The Esplanade
Cabbagetown ,St. James Town
First Canadian Place ,Underground city
Church and Wellesley
Business Reply Mail Processing Centre 969 Eastern

There are 236 unique categories such as Coffee Shop, Cafe, Bar, Sushi Restaurant, Hotel.
The 'freq' term is the frequency, i.e. how often you find this venue.
----Adelaide ,King ,Richmond ----
```
             venue  freq
0        Coffee Shop  0.07
1               Café  0.05
2                Bar  0.04
3  Sushi Restaurant  0.03
4              Hotel  0.03
```

Figure 8 below shows those categories of some venues.

	Neighbourhood	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	Adelaide ,King ,Richmond	Coffee Shop	Café	Bar	Steakhouse	Hotel	Bakery	Sushi Restaurant	Restaurant	Burger Joint	Asian Restaurant
1	Berczy Park	Coffee Shop	Cocktail Bar	Café	Beer Bar	Cheese Shop	Farmers Market	Seafood Restaurant	Bakery	Italian Restaurant	Steakhouse
2	Brockton ,Exhibition Place ,Parkdale Village	Breakfast Spot	Café	Coffee Shop	Grocery Store	Furniture / Home Store	Convenience Store	Burrito Place	Sandwich Place	Stadium	Caribbean Restaurant
3	Business Reply Mail Processing Centre 969 East...	Light Rail Station	Farmers Market	Auto Workshop	Comic Shop	Pizza Place	Restaurant	Butcher	Burrito Place	Brewery	Skate Park
4	CN Tower ,Bathurst Quay ,Island airport ,Harbo...	Airport Terminal	Airport Lounge	Airport Service	Harbor / Marina	Sculpture Garden	Boat or Ferry	Plane	Boutique	Airport Gate	Airport Food Court

Figure 8 Some venues and theirs categories.

3. Methodology   K Means Clustering

Setting number of clustering (grouping) to 5. Then colour the marker of each cluster differently. By using those categories and finding the similar categories, this K Means will try to group those venues in the same categories. See Figure 9.
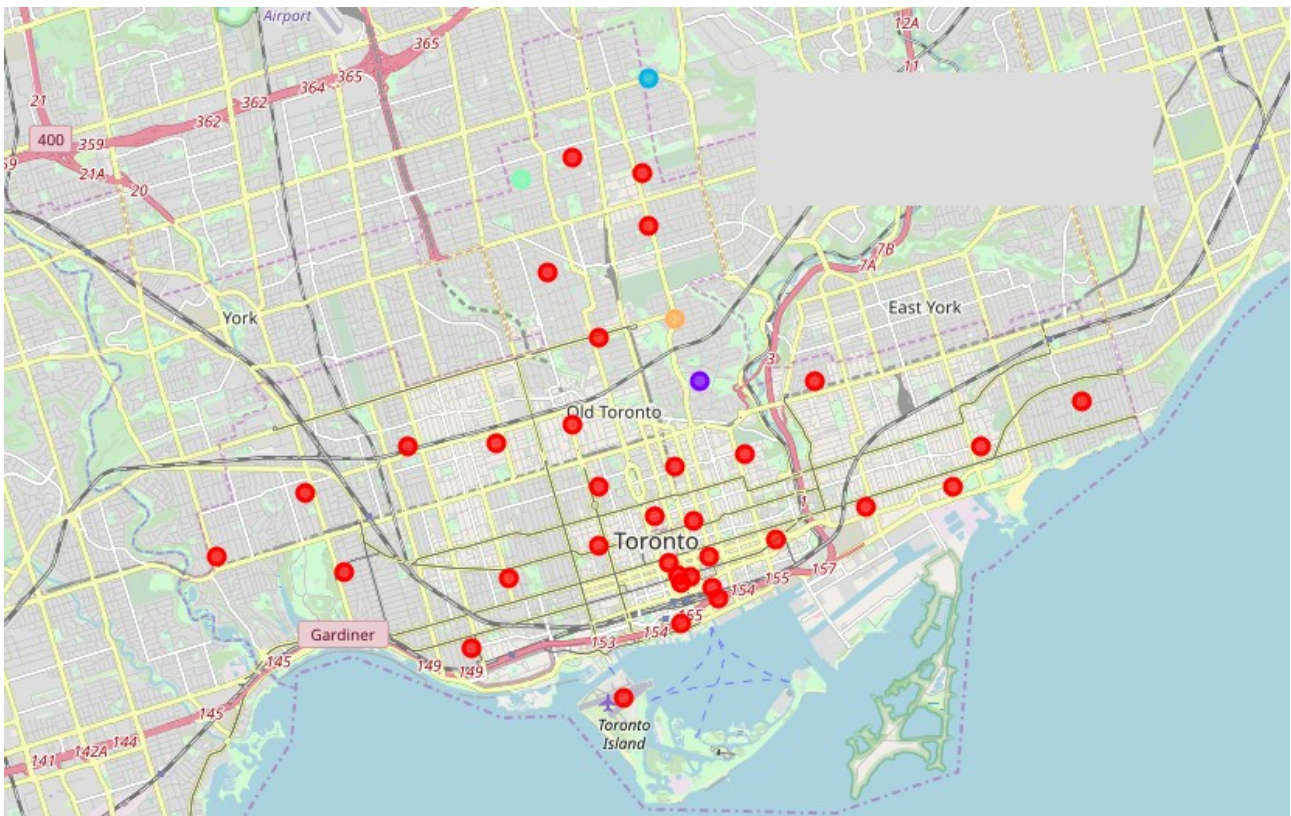

Figure 9 Clustering these venues with K-means clustering. This method will group those similar venues together.

4. Result

Cluster1

	Postcode	Longitude	Cluster Labels	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 Co...
0	M5A	-79.360636	0	Coffee Shop	Pub	Park	Bakery	Café	Mexican Restaurant	Breakfast Spot	Theater	Yoga Studio	Rest...
1	M5B	-79.378937	0	Clothing Store	Coffee Shop	Café	Cosmetics Shop	Bakery	Italian Restaurant	Sporting Goods Shop	Middle Eastern Restaurant	Fast Food Restaurant	Jap Rest...
2	M5C	-79.375418	0	Coffee Shop	Café	Hotel	Restaurant	Clothing Store	Bakery	Italian Restaurant	Cosmetics Shop	Gastropub	Bre...
3	M4E	-79.293031	0	Health Food Store	Pub	Trail	Neighborhood	Other Great Outdoors	Electronics Store	Ethiopian Restaurant	Eastern European Restaurant	Event Space	Du Rest...
4	M5E	-79.373306	0	Coffee Shop	Cocktail Bar	Café	Beer Bar	Cheese Shop	Farmers Market	Seafood Restaurant	Bakery	Italian Restaurant	Steak...
5	M5G	-79.387383	0	Coffee Shop	Sandwich Place	Ice Cream Shop	Italian Restaurant	Café	Burger Joint	Chinese Restaurant	Japanese Restaurant	Bakery	Salad...
6	M6G	-79.422564	0	Grocery Store	Café	Park	Convenience Store	Candy Store	Italian Restaurant	Baby Store	Nightclub	Athletics & Sports	Rest...
7	M5H	-79.384568	0	Coffee Shop	Café	Bar	Steakhouse	Hotel	Bakery	Sushi Restaurant	Restaurant	Burger Joint	Rest...
8	M6H	-79.442259	0	Bakery	Pharmacy	Supermarket	Bank	Bar	Smoke Shop	Café	Music Venue	Middle Eastern Restaurant	Gym / F...
9	M5J	-79.381752	0	Coffee Shop	Hotel	Aquarium	Café	Fried Chicken Joint	Brewery	Restaurant	Scenic Lookout	Italian Restaurant	Ba St...
10	M6J	-79.419750	0	Bar	Coffee Shop	Asian Restaurant	Men's Store	Restaurant	New American Restaurant	Pizza Place	French Restaurant	Vietnamese Restaurant	
11	M4K	-79.352188	0	Greek Restaurant	Coffee Shop	Ice Cream Shop	Italian Restaurant	Furniture / Home Store	Yoga Studio	Brewery	Bubble Tea Shop	Café	Cari Rest...
12	M5K	-79.381576	0	Coffee Shop	Café	Hotel	Restaurant	American Restaurant	Gastropub	Bar	Seafood Restaurant	Italian Restaurant	Deli / B...
13	M6K	-79.428191	0	Breakfast Spot	Café	Coffee Shop	Grocery Store	Furniture / Home Store	Convenience Store	Burrito Place	Sandwich Place	Stadium	Cari Rest...
14	M4L	-79.315572	0	Sandwich Place	Pizza Place	Brewery	Food & Drink Shop	Steakhouse	Fish & Chips Shop	Fast Food Restaurant	Board Shop	Liquor Store	Burge...
15	M5L	-79.379817	0	Coffee Shop	Hotel	Café	Restaurant	American Restaurant	Italian Restaurant	Gastropub	Seafood Restaurant	Bakery	Deli / B...
16	M4M	-79.340923	0	Café	Coffee Shop	Bakery	Italian Restaurant	American Restaurant	Middle Eastern Restaurant	Bar	Diner	Stationery Store	Cheese...
19	M4P	-79.390197	0	Clothing Store	Gym	Sandwich Place	Convenience Store	Breakfast Spot	Park	Hotel	Food & Drink Shop	Dance Studio	Du Rest...
20	M5P	-79.411307	0	Mexican Restaurant	Trail	Sushi Restaurant	Jewelry Store	Yoga Studio	Discount Store	Farmers Market	Falafel Restaurant	Event Space	Eth Rest...
21	M6P	-79.464763	0	Mexican Restaurant	Café	Bar	Thai Restaurant	Park	Music Venue	Fast Food Restaurant	Bookstore	Flea Market	Spea...
22	M4R	-79.405678	0	Clothing Store	Sporting Goods Shop	Coffee Shop	Yoga Studio	Chinese Restaurant	Park	Spa	Mexican Restaurant	Burger Joint	

	Postcode	Longitude	Cluster Labels	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
23	M5R	-79.405678	0	Sandwich Place	Café	Coffee Shop	Gym	BBQ Joint	Pharmacy	Pizza Place	Cosmetics Shop	Pub	Shoe
24	M6R	-79.456325	0	Coffee Shop	Gift Shop	Italian Restaurant	Restaurant	Breakfast Spot	Eastern European Restaurant	Movie Theater	Bar	Bank	Do
25	M4S	-79.388790	0	Pizza Place	Gym	Sandwich Place	Dessert Shop	Italian Restaurant	Café	Sushi Restaurant	Coffee Shop	Greek Restaurant	S Rest
26	M5S	-79.400049	0	Café	Japanese Restaurant	Italian Restaurant	Bar	Restaurant	Bakery	Bookstore	Beer Bar	Sushi Restaurant	Flowe
27	M6S	-79.484450	0	Coffee Shop	Café	Pizza Place	Italian Restaurant	Sushi Restaurant	School	Bar	Fish & Chips Shop	Latin American Restaurant	Sm
29	M5T	-79.400049	0	Bar	Vietnamese Restaurant	Café	Mexican Restaurant	Chinese Restaurant	Vegetarian / Vegan Restaurant	Coffee Shop	Bakery	Dumpling Restaurant	Desser
30	M4V	-79.400049	0	Coffee Shop	Pub	Liquor Store	Light Rail Station	Park	Sports Bar	Supermarket	Sushi Restaurant	Restaurant	Fried C
31	M5V	-79.394420	0	Airport Terminal	Airport Lounge	Airport Service	Harbor / Marina	Sculpture Garden	Boat or Ferry	Plane	Boutique	Airport Gate	Airpor
33	M5W	-79.374846	0	Coffee Shop	Restaurant	Italian Restaurant	Café	Seafood Restaurant	Beer Bar	Hotel	Breakfast Spot	Cheese Shop	Cockt
34	M4X	-79.367675	0	Coffee Shop	Park	Café	Restaurant	Italian Restaurant	Pub	Bakery	Pizza Place	Pet Store	B
35	M5X	-79.382280	0	Coffee Shop	Café	Restaurant	Hotel	Steakhouse	Gym	Bakery	Bar	American Restaurant	S Rest
36	M4Y	-79.383160	0	Coffee Shop	Japanese Restaurant	Sushi Restaurant	Restaurant	Gay Bar	Men's Store	Hotel	Fast Food Restaurant	Italian Restaurant	Mediterr Rest
37	M7Y	-79.321558	0	Light Rail Station	Farmers Market	Auto Workshop	Comic Shop	Pizza Place	Restaurant	Butcher	Burrito Place	Brewery	Skat

Cluster2

	Postcode	Longitude	Cluster Labels	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
32	M4W	-79.377529	1	Park	Playground	Trail	Dim Sum Restaurant	Farmers Market	Falafel Restaurant	Event Space	Ethiopian Restaurant	Electronics Store	Eastern European Restaurant

Cluster3

	Postcode	Longitude	Cluster Labels	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
17	M4N	-79.38879	2	Park	Lake	Swim School	Bus Line	Yoga Studio	Discount Store	Farmers Market	Falafel Restaurant	Event Space	Ethiopian Restaurant

Cluster4

	Postcode	Longitude	Cluster Labels	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
18	M5N	-79.416936	3	Garden	Home Service	Yoga Studio	Farmers Market	Falafel Restaurant	Event Space	Ethiopian Restaurant	Electronics Store	Eastern European Restaurant	Dumpling Restaurant

Cluster5

	Postcode	Longitude	Cluster Labels	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
28	M4T	-79.38316	4	Playground	Gym	Trail	Dim Sum Restaurant	Farmers Market	Falafel Restaurant	Event Space	Ethiopian Restaurant	Electronics Store	Eastern European Restaurant

5. Discussion

Cluster 1 is the best location to open the business office. It is a busy area around Toronto and there are varieties of business. Many Thai restaurants are nearby. This should be the best opportunity to start the on-line business.

6. Conclusion

From background information about Toronto from 2016 census, different websites, report from Toronto Housing Market Analysis - City of Toronto, these insight data told that the opportunity of opening Thai on-line Supermarket is a good plan. Population will increase and the predication said that many of them will face low-income in the future so the price of ingredients items should be cheapper. On-line shop can save the budgets. There are female more than male and they are around middle age. The majority group are those who have family. Both parents and lone parents by average have two kids will need to save their cost of living and cooking at home is always a good choice. They are all good target customers.

The location of the office should be near busy business areas. There are many Thai restaurants at least 100 of them so they are also the target customers. By using K-Means clustering, we found that at the south of Toronto there are many local shops such as restaurant, cafe, coffee, Airport terminal, etc. Therefore, this is the best location of all.

7. References
[1] " Thai_Canadians, census 2016", wikipedia , https://en.wikipedia.org/wiki/Thai_Canadians.
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