Finding the Best Area to Open a New Restaurant in Toronto

Arman Ahmadi

November 2020

1. Introduction

Toronto is one of the most populous city in Canada. It is diverse and it has a lot of tourists each year. It is multicultural. It provides lot of business opportunities and business friendly environment. It has attracted many different players into the market. The city is a major center for banking and finance, retailing, world trade, transportation, tourism, real estate, new media, traditional media, advertising, legal services, accountancy, insurance, theater, fashion, and food in Canada. This also means that the market is highly competitive. As it is highly developed city so cost of doing business is also one of the highest. Thus, any new business venture or expansion needs to be analyzed carefully. The insights derived from analysis will give good understanding of the business environment which help in strategically targeting the market. This will help in reduction of risk. And the Return on Investment will be reasonable.

A restaurant is a business which prepares and serves food and drink to customers in return for money, either paid before the meal, after the meal, or with an open account. Toronto is famous for its excellent cuisine. It's food culture includes an array of international cuisines influenced by the city's immigrant history.

Central and Eastern European immigrants, Italian immigrants, Jewish immigrants, Chinese and other Asian restaurants, Middle Eastern foods and etc. would be pretty common in this city. To start a new business, someone needs to choose the correct location to start its first venture. If this is successful they can replicate the same in other locations. First move is very important, thereby choice of location is very important.

In this project we will try to find an optimal location for a restaurant in Toronto. If someone is going to open a restaurant in one of the neighborhoods in Toronto, what options could be available. Since there are lots of restaurants in Toronto, this study try to detect locations that are

not already crowded with restaurants. We are also particularly interested in areas with no Italian restaurants in that neighborhood as this restaurant has a lot of customers in Canada.

We will use our data science powers to generate a few most promising neighborhoods based on these criteria. We will recommend several neighborhoods and then suggest them to the stakeholders and they can research in more detail and find the best spot for their business idea.

2. Data Acquisition and Cleaning

Based on definition of our problem, factors that will influence our decision are:

- Finding three most common venues in all the neighborhoods in Toronto.

- Finding number of existing restaurants in the neighborhood (any type of restaurant).

- Finding the desired neighborhood according to the fact that it has any restaurant near it or not.

Following data sources will be needed to extract/generate the required information:

All the common neighborhoods in Toronto will be obtained using Foursquare API

Three most common venues in these neighborhoods in Toronto will be obtained using Foursquare API

Specify that which one of these three venues have restaurant in its list and of what type they are.

Find the desired neighborhood according to the above criteria and select an appropriate option for opening the Italian restaurant.

For the Toronto neighborhood data, a Wikipedia page exists that has all the information we need to explore and cluster the neighborhoods in Toronto. You will be required to scrape the Wikipedia page and wrangle the data, clean it, and then read it into a pandas data frame so that it is in a structured format like the New York dataset. Here is the links for the neighborhoods and its latitude and longitude information:

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

http://cocl.us/Geospatial_data

Data downloaded or scraped from these sources were combined into one table. Some of the row didn't have any data which are removed from the table. Longitude and latitude of each neighborhood is assigned to the data. Here you can see the table of data after cleaning

Table1. Data related to different neighborhoods in some cities.

	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

As this report was interested in Toronto data, we just extracted the Borough related to Toronto city and deleted the rest of the information. Here you can see the data for Toronto

Table2. Data related to different neighborhoods in some cities.

	Postal Code	Borough	Neighbourhood	Latitude	Longitude
0	M5A	Downtown Toronto	Regent Park, Harbourfront	43.654260	-79.360636
1	M7A	Downtown Toronto	Queen's Park, Ontario Provincial Government	43.662301	-79.389494
2	M5B	Downtown Toronto	Garden District, Ryerson	43.657162	-79.378937
3	M5C	Downtown Toronto	St. James Town	43.651494	-79.375418
4	M4E	East Toronto	The Beaches	43.676357	-79.293031

3. Methodology

In this project we will direct our efforts on detecting Neighborhoods of Toronto that have low restaurant density, particularly those with low number of Italian restaurants.

First we specify all the neighborhood of the Toronto from our data and then obtain its latitude and longitude coordinate. Then, we analyze the neighborhoods using the Foursquare data for all the venues associated to these neighborhoods and then we extract the most three common venues for each neighborhood. Then we consider just the first and second most common venues

and check that which neighborhood has restaurants as its common venues which tells us that these areas are most likely very favorable for people to eat out. And finally we choose our desire neighborhood for our Italian restaurant business. Below is the method for doing this analysis:

First, we have shown a map of Toronto with the neighborhoods in the following figure.

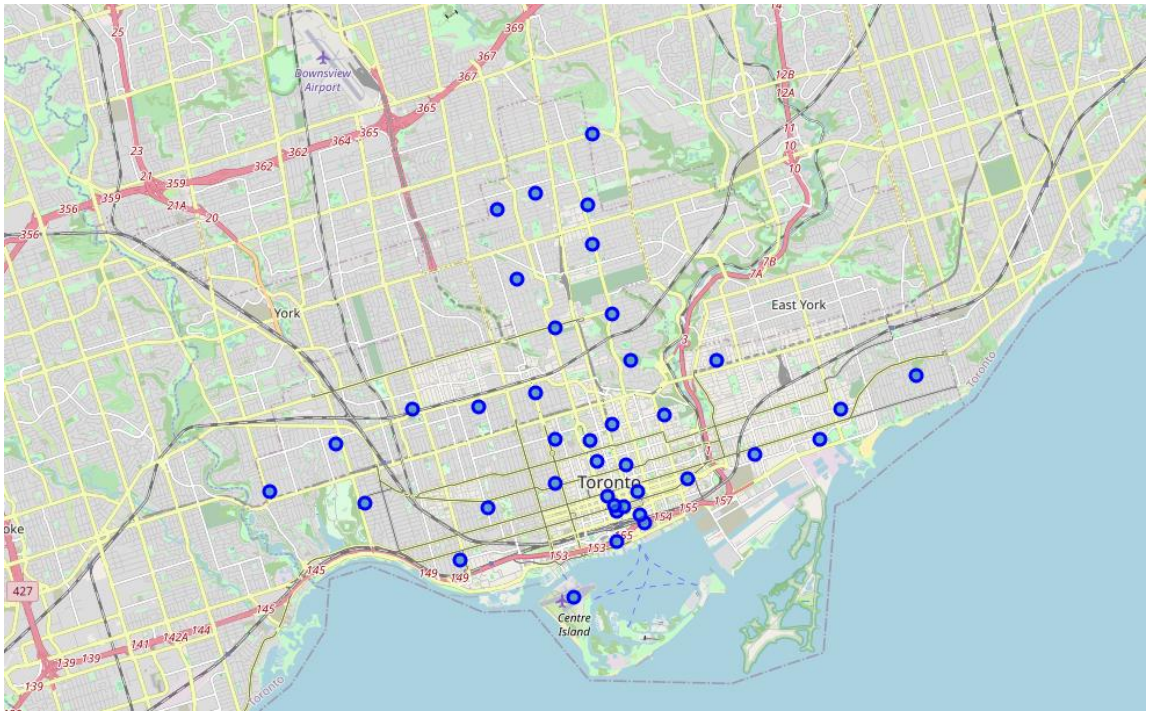

Figure 1. Toronto map with important neighborhoods

Then we get the top 100 venues in Toronto with the radius of 0.5 km. Then, create the new dataframe and display the top 3 venues for each neighborhood and then cluster neighborhoods using k-means into 3 clusters. let's visualize the resulting clusters here:

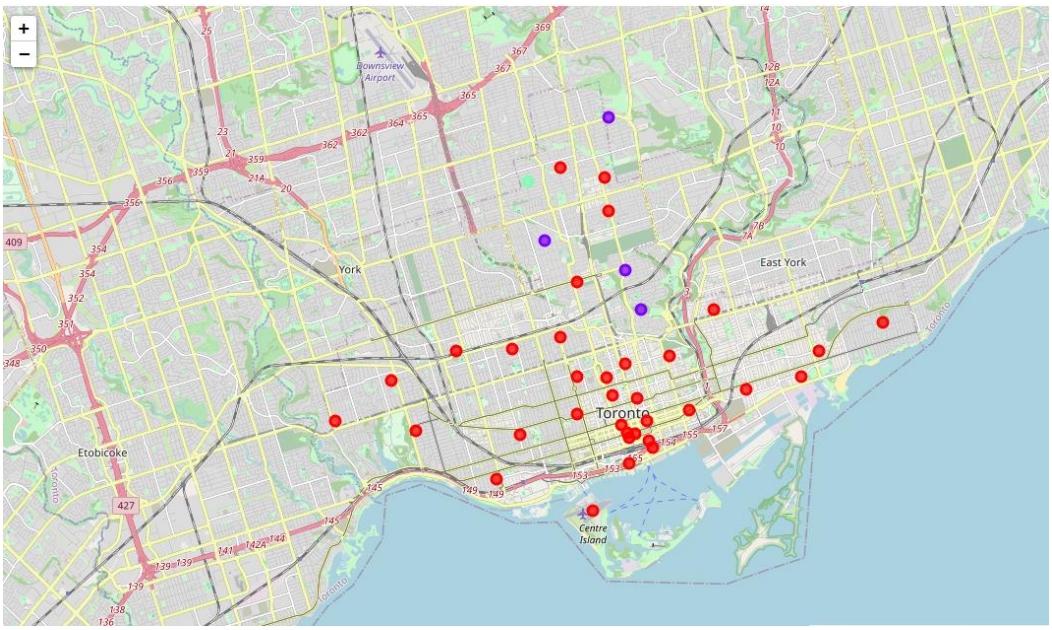

Figure 2. Clusters of Toronto neighborhoods

To see which neighborhoods have the highest number of restaurants as venues, we obtain the neighborhoods that their 1st most common venues are restaurants. And then repeat the process for the 2nd most common venues as restaurants. Then we can decide which neighborhoods would be a good option for us.

4. Results and Discussion

Our analysis shows that although there is a great number and types of restaurants in Toronto, some neighborhoods might not have enough diversity in the type of restaurants. Highest concentration of restaurants was detected in 9 neighbor hoods as their fist most common venues such as High Park, The Junction South, Kensington Market, Chinatown, Grange Park, The Danforth West, Riverdale adn some other neighborhoods as their 2nd most common venues such as: Church and Wellesley, Commerce Court, Victoria Hotel, Forest Hill North & West, Forest Hill Road Park, St. James Town, Cabbagetown, Stn A PO Boxes, Summerhill West, Rathnelly, South Hill. There is one neighborhood that both 1st and 2nd most common venues include restaurants and it is Kensington Market, Chinatown, Grange Park and the type of restaurant for that is Mexican and vegan. We can say that this neighborhood could be really favorable for opening a

new restaurant as the density of the people for using restaurants is pretty high in these neighborhoods. Please see the following results for these outputs:

Table3. Neiborhoods with restaurants as the 1st most common venues.

	Neighborhood	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue
0	High Park, The Junction South	Mexican Restaurant	Café	Bar
1	Kensington Market, Chinatown, Grange Park	Vegetarian / Vegan Restaurant	Mexican Restaurant	Bar
2	The Danforth West, Riverdale	Greek Restaurant	Coffee Shop	Italian Restaurant

Table4. Neiborhoods with restaurants as the 2nd most common venues.

	Neighborhood	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue
0	Church and Wellesley	Coffee Shop	Sushi Restaurant	Japanese Restaurant
1	Commerce Court, Victoria Hotel	Coffee Shop	Restaurant	Café
2	Forest Hill North & West, Forest Hill Road Park	Park	Sushi Restaurant	Jewelry Store
3	Kensington Market, Chinatown, Grange Park	Vegetarian / Vegan Restaurant	Mexican Restaurant	Bar
4	St. James Town, Cabbagetown	Coffee Shop	Restaurant	Pizza Place
5	Stn A PO Boxes	Coffee Shop	Italian Restaurant	Restaurant
6	Summerhill West, Rathnelly, South Hill, Forest...	Coffee Shop	American Restaurant	Restaurant

5. Conclusions

Purpose of this project was to identify Toronto areas with low number of restaurants (particularly Italian restaurants) in order to aid stakeholders in narrowing down the search for optimal location for a new Italian restaurant. By calculating the most common venues in each neighborhood of Toronto and restaurant density distribution in these neighborhoods from Foursquare data we have first identified general boroughs that justify further analysis, and then generated extensive collection of locations which satisfy some basic requirements regarding existing nearby restaurants. Clustering of those locations was then performed in order to create major zones of interest (containing greatest number of potential locations).

Final decision on optimal restaurant location will be made by stakeholders based on specific characteristics of neighborhoods and locations in every recommended zone, taking into consideration additional factors like attractiveness of each location, levels of noise / proximity to major roads, real estate availability, prices, social and economic dynamics of every neighborhood etc.