Case Study: Best Location To Open An Indian Restaurant in Toronto

1. Introduction

Toronto is the provincial capital of Ontario and the most populous city in Canada with a population of more than 2.5 million. The diverse population of Toronto reflects its historical role as an important destination of Canada immigration. It provides lot of business oppourtunities and a business friendly environment. The food and beverage processing sector is Ontario and Canada's largest manufacturing sector. This results in high competition in this sector. Careful analysis is required for any new business venture. The analysis will provide a measured decision in business decisions and processes. This will result in risk reduction and higher percentage in business returns.

2. Business Problem

The indian ethnic population has been rising over the past decade in Toronto with almost 80,000 people. This allowed business focused indian cuisines to flourish and Toronto has seen a steep increase in Indian restaurants. Starting an Indian restaurant can be a great business opportunity, however a strategy has to be put in place to fend off possible competition for the business to have healthy return.

Location is key for the success of a restaurant. With high number of pre-existing restaurants in the city, the business has to be set up in an area where there is high demand and less supply. Various factors can be taken into consideration like the ethnic population in various neighborhoods and the density of restaurants with each neighborhoods. The target audience are clients who wants to open up an indian restaurant in Toronto.

3. Data

In my analysis, I will be focusing on the location aspect and the choice of neighborhood in Toronto which will be ideal to open up their business.

To find the best location to open an indian restaurant in Toronto;

1. Data of all the boroughs and neighborhoods in Canada were extracted from https://en.wikipedia.org/wiki/List_of_postal_codes_of_Canada:_M.

2. Data was processed and cleaned to extract the data of boroughs that contain the name Toronto in it.

3. Geospatial data of the bouroughs was extracted from http://cocl.us/Geospatial_data.

4. Pre-existing indian restaurants were located in the city of Toronto using the Foursquare API, with the category id: 4bf58dd8d48988d10f941735

4. Methodology

4.1 Extraction and processing of datasets from WikiPedia Page

Data of all the boroughs and neighborhoods in Canda were extracted from https://en.wikipedia.org/wiki/List_of_postal_codes_of_Canada:_M. Only the boroughs that contain the word 'Toronto' were extracted and formed in a dataset. The dataset contained 4 boroughs and 38 neighborhoods. The geospatial data (Latitude and Logitude values) were obtained from http://cocl.us/Geospatial_data and both tables were merged based on the postal codes. Only relevants columns were retained and formed in a dataframe as shown below.

	Postal Code	Borough	Neighbourhood	Latitude	Longitude
0	M4E	East Toronto	The Beaches	43.676357	-79.293031
1	M4K	East Toronto	Riverdale,The Danforth West\n	43.679557	-79.352188
2	M4L	East Toronto	The Beaches West\n,India Bazaar	43.668999	-79.315572
3	M4M	East Toronto	Studio District\n	43.659526	-79.340923
4	M4N	Central Toronto	Lawrence Park	43.728020	-79.388790

4.2 Implementation of Foursquare API

The dataframe above will be utilized as input for the Foursquare API to obtain relevant information for each neighborhood in Toronto. Category Id, 4bf58dd8d48988d10f941735, was used to retieve data on Indian Restaurants in Toronto from the Foursquare API. The image below shows the map with the data retrieved from the API.

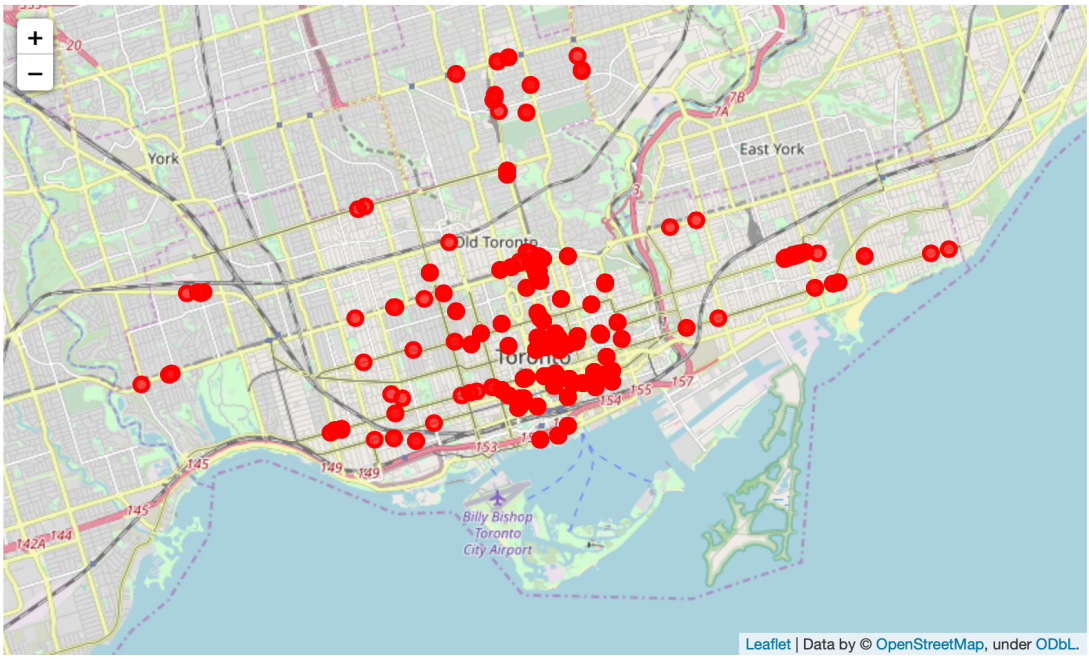


Fig 1. Indian Restaurant in Toronto

4.3 Clustering of restaurants using K-means clustering algorithm

K-means clustering was used to cluster the restaurant based on regions. Folium library was used to visualize the neighborhood in Toronto and its emerging cluster as shown below.

	Neighborhood	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\n,Richmond\n,King\n	Indian Restaurant	Sri Lankan Restaurant	Food Truck	Soup Place	Snack Place	North Indian Restaurant	Kebab Restaurant	Italian Restaurant	Indian Chinese Restaurant	Halal Restaurant
1	Berczy Park	Indian Restaurant	Sri Lankan Restaurant	Soup Place	Snack Place	North Indian Restaurant	Kebab Restaurant	Italian Restaurant	Indian Chinese Restaurant	Halal Restaurant	Gastropub
2	Brockton\n,Parkdale Village,Exhibition Place	Indian Restaurant	North Indian Restaurant	Caribbean Restaurant	Sri Lankan Restaurant	Soup Place	Snack Place	Kebab Restaurant	Italian Restaurant	Indian Chinese Restaurant	Halal Restaurant
3	Business Reply Mail Processing Centre 969 East...	Indian Restaurant	Snack Place	Burger Joint	Sri Lankan Restaurant	Soup Place	North Indian Restaurant	Kebab Restaurant	Italian Restaurant	Indian Chinese Restaurant	Halal Restaurant
4	Cabbagetown,St. James Town	Indian Restaurant	Kebab Restaurant	Sri Lankan Restaurant	Soup Place	Snack Place	North Indian Restaurant	Italian Restaurant	Indian Chinese Restaurant	Halal Restaurant	Gastropub

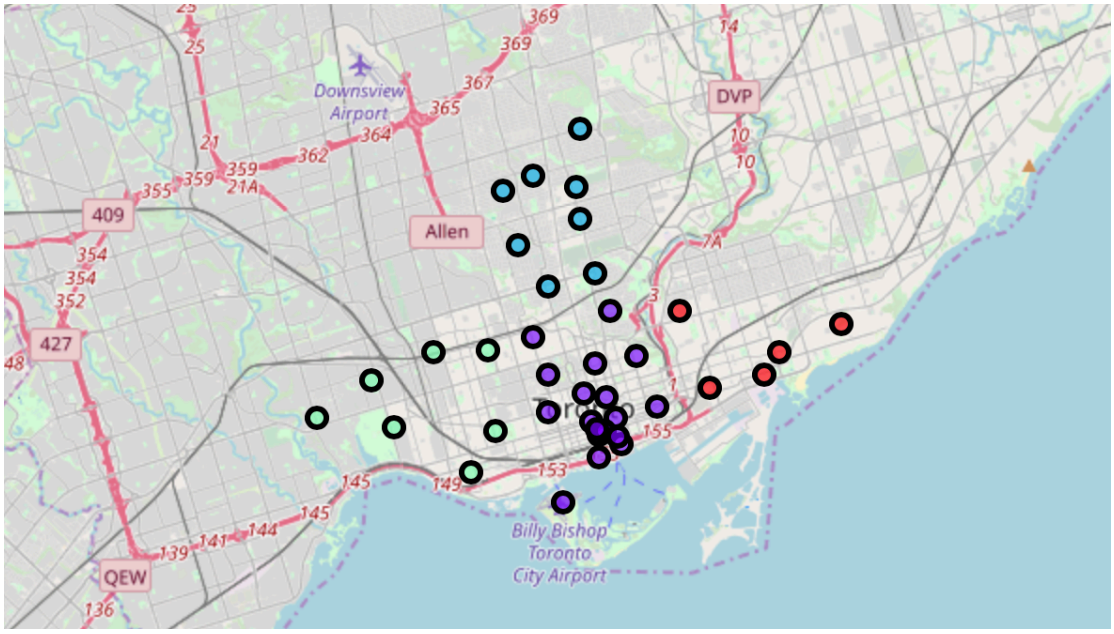


Fig 2. Clustering data areas

5. Results

In this study K-mean clustering was utilized to cluster data with less number of Indian restaurants in the neighborhoods. The results of the K-mean clustering with different number of cluster up till Cluster 3 are shown below.

Cluster 0

	Borough	Cluster	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
11	Downtown Toronto	1	0.0	Indian Restaurant	Kebab Restaurant	Sri Lankan Restaurant	Soup Place	Snack Place	North Indian Restaurant	Italian Restaurant	Indian Chinese Restaurant	Halal Restaurant	Gastropub
12	Downtown Toronto	1	0.0	Indian Restaurant	Soup Place	Food Truck	Caribbean Restaurant	Sri Lankan Restaurant	Snack Place	North Indian Restaurant	Kebab Restaurant	Italian Restaurant	Indian Chinese Restaurant
13	Downtown Toronto	1	0.0	Indian Restaurant	Kebab Restaurant	Sri Lankan Restaurant	Soup Place	Snack Place	North Indian Restaurant	Italian Restaurant	Indian Chinese Restaurant	Halal Restaurant	Gastropub
14	Downtown Toronto	1	0.0	Indian Restaurant	Sri Lankan Restaurant	Food Truck	Soup Place	Snack Place	North Indian Restaurant	Kebab Restaurant	Italian Restaurant	Indian Chinese Restaurant	Halal Restaurant
15	Downtown Toronto	1	0.0	Indian Restaurant	Sri Lankan Restaurant	Kebab Restaurant	Food Truck	Soup Place	Snack Place	North Indian Restaurant	Italian Restaurant	Indian Chinese Restaurant	Halal Restaurant
16	Downtown Toronto	1	0.0	Indian Restaurant	Sri Lankan Restaurant	Soup Place	Snack Place	North Indian Restaurant	Kebab Restaurant	Italian Restaurant	Indian Chinese Restaurant	Halal Restaurant	Gastropub
17	Downtown Toronto	1	0.0	Indian Restaurant	Sri Lankan Restaurant	Food Truck	Soup Place	Snack Place	North Indian Restaurant	Kebab Restaurant	Italian Restaurant	Indian Chinese Restaurant	Halal Restaurant
18	Downtown Toronto	1	0.0	Indian Restaurant	Sri Lankan Restaurant	Food Truck	Soup Place	Snack Place	North Indian Restaurant	Kebab Restaurant	Italian Restaurant	Indian Chinese Restaurant	Halal Restaurant
19	Downtown Toronto	1	0.0	Indian Restaurant	Sri Lankan Restaurant	Soup Place	Snack Place	North Indian Restaurant	Kebab Restaurant	Italian Restaurant	Indian Chinese Restaurant	Halal Restaurant	Gastropub
20	Downtown Toronto	1	0.0	Indian Restaurant	Sri Lankan Restaurant	Food Truck	Soup Place	Snack Place	North Indian Restaurant	Kebab Restaurant	Italian Restaurant	Indian Chinese Restaurant	Halal Restaurant

Cluster 1

	Borough	Cluster	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
3	East Toronto	0	1.0	Indian Restaurant	Fast Food Restaurant	Sri Lankan Restaurant	Soup Place	Snack Place	North Indian Restaurant	Kebab Restaurant	Italian Restaurant	Indian Chinese Restaurant	Halal Restaurant

Cluster 2

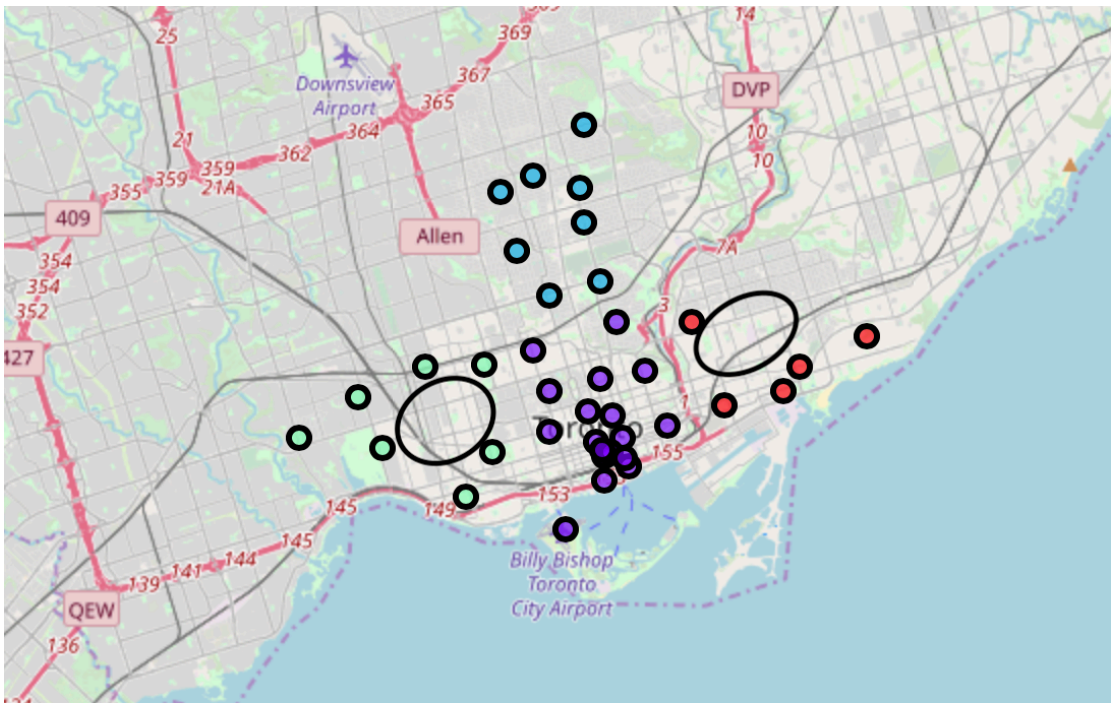
	Borough	Cluster	Cluster Labels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue	9th Most Common Venue	10th Most Common Venue
36	West Toronto	3	2.0	Indian Restaurant	Italian Restaurant	Sri Lankan Restaurant	Soup Place	Snack Place	North Indian Restaurant	Kebab Restaurant	Indian Chinese Restaurant	Halal Restaurant	Gastropub

Cluster 3

	Borough	Cluster	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
2	East Toronto	0	3.0	Indian Restaurant	Snack Place	Indian Chinese Restaurant	Halal Restaurant	Gastropub	Burger Joint	Sri Lankan Restaurant	Soup Place	North Indian Restaurant	Kebab Restaurant
33	West Toronto	3	3.0	Indian Restaurant	North Indian Restaurant	Caribbean Restaurant	Sri Lankan Restaurant	Soup Place	Snack Place	Kebab Restaurant	Italian Restaurant	Indian Chinese Restaurant	Halal Restaurant
37	East Toronto	0	3.0	Indian Restaurant	Snack Place	Burger Joint	Sri Lankan Restaurant	Soup Place	North Indian Restaurant	Kebab Restaurant	Italian Restaurant	Indian Chinese Restaurant	Halal Restaurant

6. Discussion

From the results, obtained from Cluster 0 (East Toronto) and Cluster 3 (West Toronto) are ideal places to open the business due to less competition. Cluster 1 (Downtown Toronto) and Cluster 2 (North Toronto) have high competition and poses high risk in opening up the restaurant there. Circles were drawn on the map to indicate possible location where the business could be set up.



This analysis was performed purely based on location data, to find the best location where there is minimal competition. However based on this data alone, it is inaccurate to come with a conclusive decision. Several factors need to be taken into consideration such as transportation and demographic inhabitants within each cluster to support the decision.

7. Conclusion

The goals of the project were achieved to find the best location to open up the restaurant where there is minimal competition. However, to support the results several other factors need to be taken into consideration. This study could be part of a larger study, which could help an upcoming business to open up a restaurant with Toronto.