

Exploring Toronto to open a new Mexican Restaurant

1 Introduction:

We have already studied the migration to Canada from different countries. Diversity of the migrated population opens new opportunity for the existing as well as new business. For example, Indian diaspora will be looking for Indian restaurant or Chinese diaspora will look for a Chinese restaurant. In this study, the goal is to recommend a place in Toronto for opening a Mexican Restaurant. The study will help making a smart and informed decision to select a neighborhood in Toronto to open a Mexican restaurant.

1.1 Problem Statement

The major goal of this project is to suggest a suitable neighborhood in Scarborough, Toronto to open a Mexican restaurant. Mexican food is popular not just among Mexicans but people from other ethnicities such as Canadians, Indians, and the people from other countries in South and North America. Scarborough is a popular destination for new immigrants in Canada and a multicultural hub in the Greater Toronto Area. The idea is to group the neighborhoods in Scarborough, Toronto into three clusters and figure out the least number of Mexican restaurants among them.

1.2 The Location

Scarborough is a popular destination for new immigrants in Canada and a multicultural hub in the Greater Toronto Area.

1.3 Target Audience

Shifting demographics and changing lifestyles are driving the surge in food-service businesses. Busy consumers don't have the time or inclination to cook. More and more singles, working parents and elderly people are demanding greater convenience when it comes to buying their meals. Although, Mexican cuisine is popular among all ethnicities, Hispanic/Latino population will be the major targeted audience in this case.

1.4 Importance of this project

A hard reality is that many restaurants fail during their first year, frequently due to a lack of planning. But that doesn't mean your food-service business has to be an extremely complex operation. In fact, the more streamlined you can make it, the better your chances for success. The results from this project will help an entrepreneur in food/hospitality sector in deciding the most suitable neighborhoods in Toronto to open a Mexican Restaurant.

2 Data Description/acquisition

2.1 Sources

1. List of postal codes and corresponding neighborhoods were scrapped from a Wikipedia link https://en.wikipedia.org/wiki/List_of_postal_codes_of_Canada:_M. The wikipedia link consists postal codes Starting with M (M is for city of Toronto), Borough, and Neighborhoods associated with the Postal Codes. For example, M1B postal code is associated with Scarborough, a borough while the Neighborhoods in the postal codes are Malvern and Rouge. In this project, All the neighborhoods in Scarborough will be scrapped.
1. The latitude and longitude of the neighborhoods corresponding to the postal codes in Scarborough, Toronto, Canada were acquired from http://cocl.us/Geospatial_data
1. Foursquare API were further used to get the following features:
 - a. name of the venues (Mexican Restaurants)
 - b. locations of the venues
 - c. categories of the venues
 - d. Latitude of the Venues
 - e. Longitude of the venues

2.2 Foursquare API

In this project I will use Four-square API as its prime data gathering source as it has a database of millions of places, especially their places API which provides the ability to perform location search, location sharing and details about a business

3 Methodology/Work Flow

3.1 Data Acquisition

After establishing the business problem, first stage is to acquire the desired data required to solve the problem. In this case, first step was to get the neighborhoods in Toronto, Canada. We already have the Wikipedia link containing the postal code, borough, and Neighborhoods. To scrap the data from Wikipedia, lxml and request packages are used. After scrapping the data, it has been cleaned, and tabulated in a desire format.

3.2 Assigning geographical co-ordinates

After cleaning the scrapped data, latitude and longitude for each neighborhood have been assigned from http://cocl.us/Geospatial_data

3.3 Clustering/segmenting

After assigning the co-ordinates, Foursquare API has been used to get all the venues in the corresponding neighborhoods of Toronto. Due to the limitations of the calling, the number of places per neighborhood parameter would reasonably be set to 100 and the radius parameter would be set to 500. Also, the latitude & longitude of venues as well as corresponding neighborhoods have been acquired using Foursquare API. Further, the venues were categorized/tagged in different categories like “Diner”, “Brewery”, “Gym”, “Grocery Store”, “American Restaurant”, “Mexican Restaurant” etc.

In the next step, I have used kmeans to cluster all the neighborhoods into 3 clusters 0, 1, and 2 and filtered the Mexican restaurants in corresponding neighborhoods with cluster tags.

Thereafter, using folium, all the Mexican Restaurants have been marked on the map in all three Clusters.

4 Results

4.1 Table 1: Imported html data from Wikipedia (first five rows)

	Postal Code	Borough	Neighbourhood
0	M1A	NaN	NaN
1	M2A	NaN	NaN
2	M3A	North York	Parkwoods
3	M4A	North York	Victoria Village
4	M5A	Downtown Toronto	Regent Park, Harbourfront

4.2 Table 2: Polished data (first five rows)

	Postal Code	Borough	Neighbourhood
0	M1B	Scarborough	Malvern, Rouge
1	M1C	Scarborough	Rouge Hill, Port Union, Highland Creek
2	M1E	Scarborough	Guildwood, Morningside, West Hill
3	M1G	Scarborough	Woburn
4	M1H	Scarborough	Cedarbrae

4.3 Table 3: Neighborhoods with latitude & longitude (first five rows)

	PostalCode	Borough	Neighbourhood	Latitude	Longitude
0	M1B	Scarborough	Malvern, Rouge	43.806686	-79.194353
1	M1C	Scarborough	Rouge Hill, Port Union, Highland Creek	43.784535	-79.160497
2	M1E	Scarborough	Guildwood, Morningside, West Hill	43.763573	-79.188711
3	M1G	Scarborough	Woburn	43.770992	-79.216917
4	M1H	Scarborough	Cedarbrae	43.773136	-79.239476

4.4 Table 4: Venues and neighborhoods using Foursquare API (first 10 rows)

	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
Neighborhood						
Berczy Park	57	57	57	57	57	57
Brockton, Parkdale Village, Exhibition Place	22	22	22	22	22	22
Business reply mail Processing Centre, South Central Letter Processing Plant Toronto	14	14	14	14	14	14
CN Tower, King and Spadina, Railway Lands, Harbourfront West, Bathurst Quay, South Niagara, Island airport	17	17	17	17	17	17
Central Bay Street	64	64	64	64	64	64
Christie	18	18	18	18	18	18
Church and Wellesley	76	76	76	76	76	76
Commerce Court, Victoria Hotel	100	100	100	100	100	100
Davisville	32	32	32	32	32	32
Davisville North	9	9	9	9	9	9

4.5 Fig 1: Mapping clusters using folium map



4.6 Table 5: Mexican Restaurant in cluster 0

	Neighborhood	Mexican Restaurant	Cluster Labels	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
14	Harbourfront East, Union Station, Toronto Islands	0.010000	0	43.640816	-79.381752	Chipotle Mexican Grill	43.64489	-79.383050	Mexican Restaurant
6	Church and Wellesley	0.013158	0	43.665860	-79.383160	Como En Casa	43.66516	-79.384796	Mexican Restaurant
13	Garden District, Ryerson	0.010000	0	43.657162	-79.378937	Chipotle Mexican Grill	43.65686	-79.380910	Mexican Restaurant

Table 6: Mexican Restaurant in cluster 1

	Neighborhood	Mexican Restaurant	Cluster Labels	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
17	Kensington Market, Chinatown, Grange Park	0.042254	1	43.653206	-79.400049	Torteria San Cosme	43.654702	-79.400646	Mexican Restaurant
17	Kensington Market, Chinatown, Grange Park	0.042254	1	43.653206	-79.400049	Seven Lives - Tacos y Mariscos	43.654418	-79.400545	Mexican Restaurant
17	Kensington Market, Chinatown, Grange Park	0.042254	1	43.653206	-79.400049	El Trompo	43.655832	-79.402561	Mexican Restaurant
24	Regent Park, Harbourfront	0.022222	1	43.654260	-79.360636	El Catrin	43.650601	-79.358920	Mexican Restaurant
21	North Toronto West, Lawrence Park	0.052632	1	43.715383	-79.405678	Tio's Urban Mexican	43.714630	-79.400000	Mexican Restaurant
23	Queen's Park, Ontario Provincial Government	0.032258	1	43.662301	-79.389494	Como En Casa	43.665160	-79.384796	Mexican Restaurant

Table 7: Mexican Restaurant in Cluster 2

	Neighborhood	Mexican Restaurant	Cluster Labels	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
15	High Park, The Junction South	0.08	2	43.661608	-79.464763	La Revolucion	43.665460	-79.464308	Mexican Restaurant
15	High Park, The Junction South	0.08	2	43.661608	-79.464763	Playa Cabana Cantina	43.665315	-79.465548	Mexican Restaurant

5. Discussion

After downloading and scrapping the data from the Wikipedia page, there were 10 boroughs and 103 neighborhoods. Further, using Foursquare API with the assigned attributes, I was able to get 1635 venues, which were categorized and grouped along with their neighborhoods. All three clusters are mapped as shown in figure 1. Then, Mexican restaurants were searched using and grouped in all three clusters (Table 5, 6, and 7). Six Mexican restaurants are located in cluster 1, followed by three in cluster 0, and two in cluster 2. Highest number of restaurants are located in cluster 1.

6. Conclusions

Most of the Mexican restaurants are in cluster 1 which is around Kensington Market, Chinatown, Grange Park, Regent Park, Harbourfront, North Toronto West, Lawrence Park, Queen's Park, and Ontario Provincial Government. The lowest number of Mexican restaurants are in Cluster 2 areas which are High Park and The Junction South. Hence, cluster 2 should be most suitable for opening a new Mexican Restaurant. Cluster 0 can be another good choice followed by Cluster 2 as the areas such as Harbourfront East, Union Station, Toronto Islands, Church and Wellesley, Garden District, and Ryerson have a smaller number of Mexican Restaurants as compared to the areas in Cluster 1. Looking at the Neighborhoods in Scarborough it is recommended that areas in cluster 2 will be most suitable to open a Mexican Restaurant, followed by the areas in Cluster 0. I will not recommend opening a Mexican Restaurant in the areas of Cluster 1 as there are already enough Mexican Restaurants.