**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 form 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.
2. The latitude and longitude of the neighborhoods corresponding to the postal codes in Scarborough, Toronto, Canada were acquired from <http://cocl.us/Geospatial_data>
3. 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)

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## 4.2 Table 2: Polished data (first five rows)

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

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

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## 4.5 Fig 1: Mapping clusters using folium map

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## 4.6 Table 5: Mexican Restaurant in cluster 0

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## Table 6: Mexican Restaurant in cluster 1

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## Table 7: Mexican Restaurant in Cluster 2

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## 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 me most suitable to open a Mexican Restaurant, followed by the ares in Cluster 0. I will not recommend opening a Mexican Restaurant in the areas of Cluster 1 as there are already enough Mexican Restaurants.