IBM Capstone Project : The battle of Neighborhoods

# Location analysis to open a new Indian Restaurant in Toront ,Canda

## Introduction

Toronto is the capital city of the [Canadian province](https://en.wikipedia.org/wiki/Provinces_and_territories_of_Canada) of [Ontario](https://en.wikipedia.org/wiki/Ontario). With a recorded population of 2,731,571 in 2016,[[17]](https://en.wikipedia.org/wiki/Toronto#cite_note-18) it is the [most populous city in Canada](https://en.wikipedia.org/wiki/List_of_the_100_largest_municipalities_in_Canada_by_population) and the [fourth most populous city in North America](https://en.wikipedia.org/wiki/List_of_North_American_cities_by_population). The city is the anchor of the [Golden Horseshoe](https://en.wikipedia.org/wiki/Golden_Horseshoe), an urban agglomeration of 9,245,438 people (as of 2016) surrounding the western end of [Lake Ontario](https://en.wikipedia.org/wiki/Lake_Ontario),[[18]](https://en.wikipedia.org/wiki/Toronto#cite_note-19) while the [Greater Toronto Area](https://en.wikipedia.org/wiki/Greater_Toronto_Area) (GTA) proper had a 2016 population of 6,417,516. Toronto is an international centre of business, finance, arts, and culture, and is recognized as one of the most [multicultural](https://en.wikipedia.org/wiki/Multiculturalism) and [cosmopolitan](https://en.wikipedia.org/wiki/Cosmopolitanism) cities in the world.[[19]](https://en.wikipedia.org/wiki/Toronto#cite_note-Vipond2017-20)[[20]](https://en.wikipedia.org/wiki/Toronto#cite_note-Varady2012-21)[[21]](https://en.wikipedia.org/wiki/Toronto#cite_note-HuskenNeubert2011-22)

[People](https://en.wikipedia.org/wiki/Indigenous_peoples_in_Canada) have travelled through and inhabited the Toronto area, located on a broad sloping [plateau](https://en.wikipedia.org/wiki/Plateau) interspersed with [rivers, deep ravines, and urban forest](https://en.wikipedia.org/wiki/Toronto_ravine_system), for more than 10,000 years.[[22]](https://en.wikipedia.org/wiki/Toronto#cite_note-23) After the broadly disputed [Toronto Purchase](https://en.wikipedia.org/wiki/Toronto_Purchase), when the [Mississauga](https://en.wikipedia.org/wiki/Mississaugas) surrendered the area to the [British Crown](https://en.wikipedia.org/wiki/The_Crown),[[23]](https://en.wikipedia.org/wiki/Toronto#cite_note-FOOTNOTEJohnsonWilson198934-24) the British established the town of [York](https://en.wikipedia.org/wiki/York,_Upper_Canada) in 1793 and later designated it as the capital of [Upper Canada](https://en.wikipedia.org/wiki/Upper_Canada).[[24]](https://en.wikipedia.org/wiki/Toronto#cite_note-25) During the [War of 1812](https://en.wikipedia.org/wiki/War_of_1812), the town was the site of the [Battle of York](https://en.wikipedia.org/wiki/Battle_of_York) and suffered heavy damage by [American troops](https://en.wikipedia.org/wiki/United_States_Armed_Forces).[[25]](https://en.wikipedia.org/wiki/Toronto#cite_note-26) York was [renamed](https://en.wikipedia.org/wiki/Name_of_Toronto) and incorporated in 1834 as the [city of Toronto](https://en.wikipedia.org/wiki/Old_Toronto). It was designated as the capital of the province of Ontario in 1867 during [Canadian Confederation](https://en.wikipedia.org/wiki/Canadian_Confederation).[[26]](https://en.wikipedia.org/wiki/Toronto#cite_note-27) The [city proper](https://en.wikipedia.org/wiki/City_proper) has since expanded past its original borders through both [annexation](https://en.wikipedia.org/wiki/Merger_(politics)) and [amalgamation](https://en.wikipedia.org/wiki/Amalgamation_of_Toronto) to its current area of 630.2 km2 (243.3 sq mi).

The diverse population of Toronto reflects its current and historical role as an important destination for [immigrants to Canada](https://en.wikipedia.org/wiki/Immigration_to_Canada).[[27]](https://en.wikipedia.org/wiki/Toronto#cite_note-toronto_diversity-28)[[28]](https://en.wikipedia.org/wiki/Toronto#cite_note-diverse_city-29) More than 50 percent of residents belong to a [visible minority](https://en.wikipedia.org/wiki/Visible_minority) population group,[[29]](https://en.wikipedia.org/wiki/Toronto#cite_note-sc-geo-profile-to-30) and over 200 distinct [ethnic origins](https://en.wikipedia.org/wiki/Ethnic_group) are represented among its inhabitants.[[30]](https://en.wikipedia.org/wiki/Toronto#cite_note-Diversity_Toronto_Facts-31) While the majority of Torontonians speak [English](https://en.wikipedia.org/wiki/English_language) as their primary language, over 160 languages are spoken in the city.[[31]](https://en.wikipedia.org/wiki/Toronto#cite_note-2011_census:_Language-32)

The demographics of Toronto, Ontario, Canada make Toronto one of the most multicultural and multiracial cities in the world. In 2016, 51.5% of the residents of the city proper belonged to a visible minority group, compared with 49.1% in 2011, and 13.6% in 1981. Toronto also has established ethnic neighbourhoods such as the multiple Chinatowns, Corso Italia, Little Italy, Little India, Greektown, Koreatown, Little Jamaica, Little Portugal and Roncesvalles, which celebrate the city's multiculturalism.

The last complete census by Statistics Canada estimated there were 2,731,571 living in Toronto, making it the largest city in Canada and the fourth most populous municipality in North America. Toronto's population grew by 4.3% from 2011 to 2016, with an annual growth rate of 0.86%. 2011 Census population data for the City of Toronto are found readily aggregated at a finer level than the city as a whole at i. the electoral district (riding) level (2003 redistribution) and ii. the neighbourhood level. The three ridings with the largest increase in population between 2006 and 2011 in the City of Toronto have been

•Trinity-Spadina (25.5%), •Etobicoke-Lakeshore (7.3%), and •Toronto Centre (7.3%).

## Problem

In this assignment we will analyse the the neighbourhoods of Toronto and try to determine which location may be a good choice to setup an Indian Restaurant . The analysis will take into consideration the proximity of the location from Toronto Central . How many restaurants it already has and in the process we will determine which location has the best potential for the owner .

## Things to consider

We have considered the neighbourhoods near Toronto and the Boroughs they belong to . The Neighbourhood information will be sourced from Wikipedia. The Lattitude Longitude information will be sourced from a CSV file. We will consider the proximity of each location and number of restaurants in that location and the types of restaurant they already have.

The restaurant information will be sourced from Foursquare API.

## What we are not considering

We are not considering Population of each neighborhood as one of the parameters at the moment, as locations in close proximity of Toronto central tend to have better population anyway.

## Information Source

* The neighbourhood data will be sourced from the following Wikipedia link -<https://en.wikipedia.org/wiki/List_of_postal_codes_of_Canada:_M>
* The Lattitude and Longitude information will be sourced from the CSV file kept in this location-<http://cocl.us/Geospatial_data>
* The venue information will be fetched using the Foursquare APIs .

## Python Libraries to be used

* Numpy - To hande data as a Dataframe
* Pandas – For advanced DataAnalysis
* Matplotlib-For visualization
* Json- Library to handle JSON Files
* Geopy.geocoders -converts an address into Latitude , longitude information
* Requests – request handler
* Pandas.io.json – transforming JSON files into dataframes
* Sklearn – For advanced clustering algorithms
* Folium – Map visualization
* Beautifulsoup – Webscrapping

## Methodology used

We will use K-means Agglomerative clustering to cluster neighbourhoods to understand what are our most common restaurants based on each neighbourhood . Based on that we will determine which neighbourhood has best scope of having an Indian Restaurant.