

1. A description of the problem and a discussion of the background. (15 marks)

1. Introduction

Toronto, a population around over 6 million is the capital of the province of Ontario. It is a major Canadian city along Lake Ontario's northwestern shore. It's a dynamic metropolis with a core of soaring skyscrapers, all dwarfed by the iconic, free-standing CN Tower. Toronto also has many green spaces, from the orderly oval of Queen's Park to 400-acre High Park and its trails, sports facilities and zoo.

According to the 2011 National Household Survey (NHS) at https://en.wikipedia.org/wiki/Demographics_of_Toronto, there are 1,264,395 non-Whites, or 20.2% of Canada's visible minority population, live in the city of Toronto; of this, approximately 70 percent are of Asian ancestry.

A good tasty Asian cuisines such as Nasi Lemak (Malaysia), Tom Yam(Thailand), Roti Canai(Malaysia), Lamb Korma(Indian) and many other good Asian food are definitely among the sought after menus in the correct neighborhood.

The questions for opening an asian restaurant would be:

1. Which area have high concentration of ethnic asian
2. Which area have less asian restaurant
3. What are common venues surrounding the neighbourhood

The problem statement for the project is

- 1. Where is the best location to open an asian cuisine restaurant in Toronto**

The stakeholder or the target audience for this would be

1. Any business owner who would want to venture into food industry
2. Food chain business owner who would want to expand their businesses
3. Marketing company in food business industry
4. Fund manager who would want to fund a startup for food business
5. Food lovers themselves who just wish to have a good asian cuisines
6. Tourist who are looking for good asian cuisine

2. A description of the data and how it will be used to solve the problem. (15 marks)

We will be using data source below to answer the problem we sought to solve. Explanation of each data is included.

1. Data contains postal code, borough and neighborhood for Toronto area.
 1. https://en.wikipedia.org/wiki/List_of_postal_codes_of_Canada:_M,
 2. Description : This page will contain the table of Toronto neighborhood with postal code, borough and neighbourhood. This is very important data and where we start the project with. We will be scraping the data from the website using BeautifulSoup library and load into dataframe from manipulation

	PostalCode	Borough	Neighborhood
0	M3A	North York	Parkwoods
1	M4A	North York	Victoria Village
2	M5A	Downtown Toronto	Regent Park, Harbourfront
3	M6A	North York	Lawrence Manor, Lawrence Heights
4	M7A	Queen's Park	Ontario Provincial Government

2. Geospatial information for Toronto borough and neighborhood

1. https://cf-courses-data.s3.us.cloud-object-storage.appdomain.cloud/IBMDeveloperSkillsNetwork-DS0701EN-SkillsNetwork/labs_v1/Geospatial_Coordinates.cs
2. Description : This data will provide the latitude and longitude information for the neighborhood in Toronto. We will read them from the source (csv format) and load to dataframe and then match them to the Toronto neighborhood data we have above.

	Postal Code	Latitude	Longitude
0	M1B	43.806686	-79.194353
1	M1C	43.784535	-79.160497
2	M1E	43.763573	-79.188711
3	M1G	43.770992	-79.216917
4	M1H	43.773136	-79.239476

3. Demography breakdown of Toronto area based on the ethnic

1. [Demographics of Toronto – Wikipedia](#)
2. Description : This data will provide concentration of ethnic in Toronto areas. We can then zoom into these areas where asian ethnic are high in density.

The top visible-minority groups per **Community Council** (2016 Census) ^[34] are as follows:

- **Toronto & East York** (847,045): White: 65.3%, Chinese: 8.9%, South Asian: 6.7%, Black: 5.6%
- **North York** (638,100): White: 47.4%, Chinese: 14.0%, South Asian: 8.5%, Filipino: 8.0%, West Asian: 5.3%, Black: 5.2%
- **Scarborough** (623,135): White: 26.5%, South Asian: 25.4%, Chinese: 19.0%, Black: 10.8%, Filipino: 8.4%
- **Etobicoke York** (583,395): White: 48.9%, Black: 15.7%, South Asian: 11.9%, Latin American: 5.6%

Community Council ↕	1996 ↕	Percent change ↕	2001 ↕	Percent change ↕	2006 ↕	Percent change ↕	2011 ↕	Total percent change (1996-2011) ↕
Toronto & East York	28.7%	+3.9%	32.6%	+0.5%	33.1%	0.0%	33.1%	+4.4%
Etobicoke York	31.1%	+6.0%	37.1%	+3.4%	40.5%	+2.8%	43.3%	+12.2%
North York	39.7%	+2.9%	42.6%	+5.1%	47.7%	+3.5%	51.2%	+11.5%
Scarborough	51.9%	+8.1%	60.0%	+7.4%	67.4%	+2.9%	70.3%	+18.4%

4. Foursquare location data via API for identifying and exploring the selected localities and surroundings areas where high in ethnic asian population

1. Creation of developer account is required to have an access to Foursquare API.

2. Foursquare API can be accessed as below
 1. [url = 'https://api.foursquare.com/v2/venues/explore?client_id={}&client_secret={}&ll={},{}&v={}&radius={}&limit={}'.format\(CLIENT_ID, CLIENT_SECRET, latitude, longitude, VERSION, radius, LIMIT\)](https://api.foursquare.com/v2/venues/explore?client_id={}&client_secret={}&ll={},{}&v={}&radius={}&limit={})
 2. Credentials and parameters must be supplied for each of the request such as
 1. CLIENT_ID = 'xxx' # your Foursquare ID
 2. CLIENT_SECRET = 'xxx' # your Foursquare Secret
 3. ACCESS_TOKEN = 'xxx' # your FourSquare Access Token
 4. VERSION = '20180604'
 3. Foursquare location data will be critical in exploring the localities and find the concentration of asian food outlet or restaurant in those searched areas.
 4. Hence, we would leverage Foursquare location data to:
 1. identify the location of most dense Asian origin population in Toronto
 2. identify the top 10 most common venues for neighborhood with dense Asian origin
 3. Less dense Asian restaurant in the dense Asian origin area