Introduction

Toronto is one of the most multicultural cities in the world. According to the most recent census (2016) the city's population is made up of 51 per cent of residents born outside of Canada, and this doesn't even take into consideration the presence of second generation immigrants. Toronto is believed to be home to 230 different nationalities.

Within Toronto over 180 languages and dialects are spoken and according to the 2006 consensus, about 47% of immigrants still practice their mother tongue.

As is common in any large city the immigrant populations have tendencies to reside in neighbourhoods which provide proximity to residents of a similar cultural background. As a result, each Toronto neighbourhood embodies a distinct culture.

Toronto features dozens of recognizable international neighborhoods including Chinatown, Greektown, Roncesvalles Village (Little Poland), Little Italy, Koriatown and Little India.

Toronto's population statics based upon the previous 3 censuses (2006, 2011, 2016) are:

Visible minority and Aboriginal population							
Population group		**Population (2016)**	**% of total population (2016)**	**Population (2011)**	**% of total population (2011)**	**Population (2006)**	**% of total population (2006)**
European (White)		1,282,750	47.7%	1,292,365	50.2%	1,300,330	52.5%
Visible minority group	South Asian	338,965	12.6%	317,100	12.3%	298,370	12%
	Chinese	299,460	11.1%	278,390	10.8%	283,075	11.4%
	Black	239,850	8.9%	218,160	8.5%	208,555	8.4%
	Filipino	152,715	5.7%	132,445	5.1%	102,555	4.1%
	Latin American	77,160	2.9%	71,205	2.8%	64,855	2.6%
	Arab	36,030	1.3%	28,920	1.1%	22,485	0.9%
	Southeast Asian	41,645	1.5%	46,825	1.8%	37,495	1.5%
	West Asian	60,325	2.2%	50,235	2%	42,755	1.7%
	Korean	41,640	1.5%	37,225	1.4%	34,220	1.4%
	Japanese	13,410	0.5%	12,315	0.5%	11,965	0.5%
	Visible minority, n.i.e.	36,975	1.4%	33,670	1.3%	25,195	1%
	Multiple visible minorities	47,675	1.8%	37,920	1.5%	31,100	1.3%
Total visible minority population		1,385,850	51.5%	1,264,395	49.1%	1,162,630	46.9%
Aboriginal group	First Nations	14,380	0.5%	12,990	0.5%	9,130	0.4%
	Métis	7,270	0.3%	4,875	0.2%	3,650	0.1%
	Inuit	275	0%	305	0%	195	0%
	Aboriginal, n.i.e.	645	0%	920	0%	485	0%
	Multiple Aboriginal identities	500	0%	180	0%	145	0%
Total Aboriginal population		23,065	0.9%	19,265	0.7%	13,605	0.5%
Total population		2,691,665	100%	2,576,025	100%	2,476,565	100%

The top 30 languages spoken in Toronto (2016):

Language	Population	%
English	1,375,900	50.9
Cantonese	114,670	4.2
Mandarin	111,405	4.1
Tagalog (Filipino)	83,230	3.1
Spanish	72,850	2.7
Italian	62,640	2.3
Portuguese	59,355	2.2
Tamil	57,535	2.1
Farsi	49,185	1.8
Urdu	37,420	1.4
Russian	36,145	1.3
French	35,440	1.3
Korean	33,665	1.2
Arabic	29,825	1.1
Bengali	28,460	1.1
Greek	27,840	1.0
Gujarati	26,400	1.0
Polish	25,060	0.9
Vietnamese	24,775	0.9
Panjabi (Punjabi)	19,965	0.7
Ukrainian	15,465	0.6
Hindi	15,230	0.6
German	14,515	0.6
Serbian	13,380	0.5
Romanian	12,335	0.5
Hungarian	11,885	0.5
Somali	11,375	0.4
Turkish	8,855	0.3
Albanian	8,495	0.3
Armenian	7,845	0.3

The statistics mentioned up to this point have related only to geography officially designated as Toronto. However, the city has sprawled far beyond its boundaries in recent decades. When speaking of Toronto, we really need to include adjoining communities such as Mississauga, Brampton, Vaughan, Richmond Hill, and Markham, because the city now includes these communities, with residents working and living in any of these communities. To a visitor not concerned with municipal boundaries, the entire region would be simply viewed as Toronto. This collective group of Toronto and is neighboring communities is often referred to as the Greater Toronto Area (GTA).

Historically, when immigrant populations settled in Toronto over the past century they tended to settle in the downtown core. Due to crowding in Toronto proper, and increasing real estate prices, communities began to pop up in the west, north and east, and later generations moved to these newer areas of Toronto and surrounding communities.

The result of this relocation of second and third generation immigrants, as well as more recent immigration patterns, is that individual ethnic communities may now have more than one distinct population grouping within the GTA.

When new communities develop, businesses must transition to serve these populations. By studying the locations of services catering to specific cultural populations, in particular types of restaurants, we may determine that distinct clusters of restaurants exist throughout the GTA. The locations and clusters of restaurants serving specific ethnic food gives us insight into who might be living in these neighbourhoods. For example, this clustering may indicate that Toronto does not only have the historic “Chinatown” district in the downtown core – but does in fact have multiple additional “Chinatowns” throughout the GTA. This same clustering of services may indicate the existence of various population groups possessing multiple pockets.

The purpose of this analysis is to provide an understanding of the composition of the neighbourhoods in Toronto, in order to give urban planners, business owners, and even municipal leaders valuable insight into the successful planning and delivery of future services.

Data Collection

The goal of this analysis project is to attempt to identify neighbourhoods in Toronto and the immediate vicinity which contain a significant density of restaurants of a style and therefore provides clues to the cultural makeup of the community.

Define Neighbourhoods

Our first step in this process will be to identify the unique neighbourhoods to be included in our analysis. Canadian addresses are identified by a postal code of the format:

'LNL NLN'

Where L is a letter in the range A to Z

N is a number in the range 0 to 9

We will use the first 3 positions of postal codes (the LNL) to unique name and label the neighbourhoods.

All postal codes within the official municipal boundaries of Toronto being with the letter 'M'. The web page https://en.wikipedia.org/wiki/List_of_postal_codes_of_Canada:_M will provide the raw neighbourhood data we require for the City of Toronto portion of our analysis. We will need to manipulate this data into the desired format using the BeautifulSoup Python package.

For the purpose of our analysis we have chosen to expand our areas of interest beyond the municipal boundaries of Toronto. The adjoining communities of Mississauga, Brampton, Vaughan, Richmond Hill, and Markham will also be included. The postal codes for these communities do not begin with the letter 'M' and therefore the information for these communities will not be supplied the https://en.wikipedia.org/wiki/List_of_postal_codes_of_Canada:_M pages. These additional postal codes will be identified by manually analyzing the postal codes details of these communities. This process will need to be performed manually because it will require judgement calls on which geographic areas are sufficiently close to Toronto to be appropriate candidates for inclusion. Also, automatic identification of these communities is problematic because they often have been assigned historic names. For example, rather than using the name 'Vaughan' these postal districts have old village names such as 'Concord', 'Maple', 'Thornhill', and 'Woodbridge'. Once identified these additional neighbourhoods will be manually added to the list automated from the the https://en.wikipedia.org/wiki/List_of_postal_codes_of_Canada:_M page.

Latitude and Longitude of Neighbourhoods

For each neighbourhood previously identified we will require the geographic location coordinates. For the postal codes within the official Toronto boundaries we can obtain a list of their latitude and longitude values from the page http://cocl.us/Geospatial_data. For the additional communities we he chosen to manually add (Mississauga, Brampton, Vaughan, Richmond Hill, and Markham) we will need to manually determine their latitude and longitude and add them to the Toronto list. These additional coordinates can be obtained by performing lookups using a variety of websites including https://www.latlong.net/ .

Geographic location of Toronto

In order to undertake our analysis we will be making extensive use of mapping and location data. Since our maps will be centered on Toronto we will require the latitude and longitude values of the city. This can be obtain using the Nominatim module we will import using the 'from geopy.geocoders import Nominatim' command.

Venue Data

We will obtain lists of restaurants and their locations by utilizing the Foursquare API. The API will locate restaurant venues of a specified restaurant style which are geographically close to each neighbourhood in our study.

The API call will be performed with the following command:

```
'https://api.foursquare.com/v2/venues/explore?&client_id={}&client_secret={}&v={}&ll={},{}&query={}&radius={
}&limit={}'.format(
CLIENT_ID,
CLIENT_SECRET,
VERSION,
lat,
lng,
search_query,
radius,
LIMIT)
```

Where lat = latitude of specific postal neighbourhood
lng = longitude of specific postal neighbourhood
search_query = search string we are attempting to identify.
Examples include 'Chinese Restaurant' or 'Italian Restaurant
radius = venue results will be limited to this many meters from the specified location
LIMIT = the maximum number of venues to be returned in the results

Methodology

<<Will be created in future stage of project>>

Results

<<Will be created in future stage of project>>

Discussion

<<Will be created in future stage of project>>

Conclusion

<<Will be created in future stage of project>>