

Capstone Project – Battle of the Neighbourhoods

1. Introduction

1.1 Background

Many people under the age of 30 come to Canada for a short working holiday under an IEC Work Permit. When deciding which Canadian city to move to, a number of factors must be considered. Two of the most popular destinations for young work permit holders are Toronto and Calgary. Both cities are attractive to young people as they offer an active nightlife and are located close to ski hills and other well-known tourist destinations. For Calgary, the main attraction is The Rockies and for Vancouver, it's Whistler and the Sunshine Coast. In addition, both cities are large enough to have a number of entry level jobs available at all times with the majority of entry level positions being customer-facing roles.

When first arriving in Canada, many permit holders seek entry level jobs in restaurants and cafes. This is due to the accessibility of such positions, the fact that these positions offer tips as additional compensation and that in most cases, the worker may start their first shift almost immediately after being hired. This is especially important as both cities are quite expensive and it's easy to use a large portion of savings setting oneself up in a new country. It is, therefore, important for future travellers to know what kind of venues each city has and the number of such venues. In addition, it is important to know where the venues are located so that one may move into a neighbourhood which is expected to have a number of entry level jobs available within walking distance.

1.2 Aim

The aim of the following project is to analyse the types and number of venues associated with both Toronto and Calgary in order to establish which city young Work Permit holders should move to.

The following report will focus on restaurants as they provide the greatest amount of compensation via tips and are thus, are more desirable than café positions.

2. Data

2.1 Data Sources

2.1.1 Foursquare API

Foursquare, an independent location data platform, contains data on over 105 million places worldwide. Foursquare enables its users to search for venues of a specific type within a certain radius from the chosen coordinates. By leveraging the Foursquare venue data for both Calgary and Toronto, one can create a comparison of the two cities.

The information that will be pulled from the Foursquare data frame is the venue name, location and type. The following report will focus on restaurants and cafes.

Please see the below example table which demonstrates what type of data may be pulled from Foursquare i.e. Venue, Venue Latitude, Venue Longitude, Venue Category. https://github.com/BiancaGlascott/Coursera_Capstone/blob/main/Foursquare%20Data%20eg.jpg

2.1.2 Toronto Neighbourhood Data

A list of neighbourhoods and their corresponding postal codes within Toronto will be utilised. The neighbourhood data for Toronto may be found at the following link: https://en.wikipedia.org/wiki/List_of_postal_codes_of_Canada:_M

2.1.3 Toronto Geospatial Data

The latitude and longitude values of each Toronto neighborhood will be utilised. This geospatial data may be found at the following link: http://cocl.us/Geospatial_data

2.1.4 Calgary Neighbourhood Data

A list of neighbourhoods and their corresponding postal codes within Calgary will, likewise, be utilised. The Calgary neighbourhood data may be found at the following link. https://en.wikipedia.org/wiki/List_of_postal_codes_of_Canada:_T

2.2 Data Cleaning

Both the Calgary and Toronto datasets were scraped from Wikipedia. Any rows without an assigned borough were dropped to avoid incomplete data. In addition, for any rows where the neighborhood was not assigned, the neighborhood was replaced with its corresponding borough.

The Toronto dataset, scraped from Wikipedia, did not contain latitude and longitude values for the listed neighborhoods. Therefore, the geospatial data was combined with the neighborhood data to produce a single dataset.

Foursquare can only generate 50 results at a time so both datasets were filtered down to generate more specific neighborhood data. The Toronto data was filtered so that only data corresponding to the borough of Downtown Toronto was remaining. The Calgary dataset was first filtered by borough to give only Calgary neighborhood data. It was then subsequently filtered so that only data of Downtown Calgary and its surrounding suburbs remained. This was done by filtering through the postal codes.

3. Methodology

A function was created which served to find all venues within a 1000m radius of the neighborhood coordinates provided. Said function leveraged the Foursquare API in order to get the venue data. The function gave a 'nearby_venues' dataframe which contained the following information: Neighborhood, Neighborhood Latitude, Neighborhood Longitude, Venue, Venue Latitude, Venue Longitude and Venue Category.

The following is the first 5 columns of the Calgary Venues data:

Table 1: Calgary Venues Data

	Neighborhood	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
0	Penbrooke Meadows, Marlborough	51.049680	-113.964320	Bob Bahan Aquatic & Fitness Centre	51.041609	-113.964319	Gym / Fitness Center
1	Penbrooke Meadows, Marlborough	51.049680	-113.964320	TD Canada Trust	51.052399	-113.970643	Bank
2	Penbrooke Meadows, Marlborough	51.049680	-113.964320	7-Eleven	51.045519	-113.957341	Convenience Store
3	Penbrooke Meadows, Marlborough	51.049680	-113.964320	Shoppers Drug Mart	51.052750	-113.977420	Pharmacy
4	Penbrooke Meadows, Marlborough	51.049680	-113.964320	7-Eleven	51.044357	-113.969612	Convenience Store

The venues were then filtered so that only data corresponding to a venue type of 'Restaurant' remained. This may be seen for the Calgary Venues data below.

Table 2: Calgary Venues Data for Restaurants Only

	Neighborhood	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
7	Penbrooke Meadows, Marlborough	51.049680	-113.964320	Burger King	51.053909	-113.955502	Fast Food Restaurant
10	Penbrooke Meadows, Marlborough	51.049680	-113.964320	Pho Rang Dong	51.044656	-113.969383	Vietnamese Restaurant
15	Forest Lawn, Dover, Erin Woods	51.0318	-113.9786	Shawarma Palace	51.037969	-113.979086	Falafel Restaurant
17	Forest Lawn, Dover, Erin Woods	51.0318	-113.9786	Pacific Hut Restaurant	51.036922	-113.988767	Asian Restaurant
19	Forest Lawn, Dover, Erin Woods	51.0318	-113.9786	Indonesian Kitchen	51.037683	-113.977513	Indonesian Restaurant
...
544	Millrise, Somerset, Bridlewood, Evergreen	50.9093	-114.0721	KFC	50.915200	-114.067000	Fast Food Restaurant
546	Millrise, Somerset, Bridlewood, Evergreen	50.9093	-114.0721	McDonald's	50.912505	-114.064378	Fast Food Restaurant
551	Millrise, Somerset, Bridlewood, Evergreen	50.9093	-114.0721	Mimosa	50.901340	-114.067665	Vietnamese Restaurant
552	Millrise, Somerset, Bridlewood, Evergreen	50.9093	-114.0721	Swiss Chalet	50.901680	-114.065574	Restaurant
555	Douglas Glen, McKenzie Lake, Copperfield, East...	50.9023	-113.9873	Forever Good Asian Cuisine	50.903979	-113.989547	Asian Restaurant

A total number of restaurants for each postal code was generated and the data was sorted so that neighborhoods containing the most restaurants were listed first.

Table 3: Calgary Venues Data for Restaurants Only with Total Column

[illegible]

4. Results

The total number of restaurants found in each of Downtown Toronto's neighborhoods may be seen below:

Table 4: Total Number of Restaurants in the Neighborhoods of Downtown Toronto

Out[104]:

	Neighborhood	Restaurant Total
17	University of Toronto, Harbord	14
3	Church and Wellesley	14
8	Kensington Market, Chinatown, Grange Park	14
6	Garden District, Ryerson	13
16	Toronto Dominion Centre, Design Exchange	13
11	Richmond, Adelaide, King	13
9	Queen's Park, Ontario Provincial Government	13
5	First Canadian Place, Underground city	13
4	Commerce Court, Victoria Hotel	13
13	St. James Town	12
2	Christie	12
1	Central Bay Street	11
14	St. James Town, Cabbagetown	10
15	Stn A PO Boxes	10
0	Berczy Park	10
10	Regent Park, Harbourfront	6
7	Harbourfront East, Union Station, Toronto Islands	4
12	Rosedale	2

Visualizing the above data using Seaborn yields the following graph:

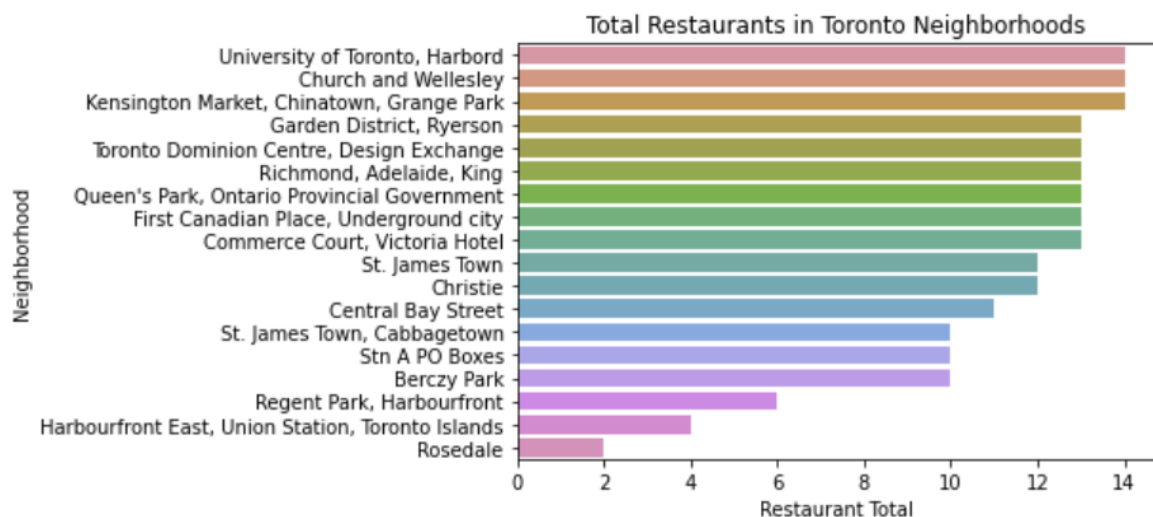


Figure 1: Total Number of Restaurants in the Neighborhoods of Downtown Toronto

The total number of restaurants found in Downtown Calgary and the surrounding suburbs may be seen below:

Table 5: Total Number of Restaurants in the Neighborhoods of Calgary

Out[105]:

	Neighborhood	Restaurant Total
1	Bridgeland, Greenview, Zoo, YYC	21
6	Highfield, Burns Industrial	20
13	Oak Ridge, Haysboro, Kingsland, Kelvin Grove, ...	20
3	Connaught, West Victoria Park	19
2	City Centre, Calgary Tower	17
7	Inglewood, Burnsland, Chinatown, East Victoria...	15
11	Millrise, Somerset, Bridlewood, Evergreen	15
15	South Calgary (Altadore / Bankview / Richmond)	10
5	Forest Lawn, Dover, Erin Woods	6
10	Midnapore, Sundance	6
12	Mount Pleasant, Capitol Hill, Banff Trail	6
8	Kensington, Westmont, Parkdale, University	3
9	Lynnwood Ridge, Ogden, Foothills Industrial, G...	2
14	Penbrooke Meadows, Marlborough	2
0	Braeside, Cedarbrae, Woodbine	1
4	Douglas Glen, McKenzie Lake, Copperfield, East...	1

Again, visualizing the data using Seaborn yields the following:

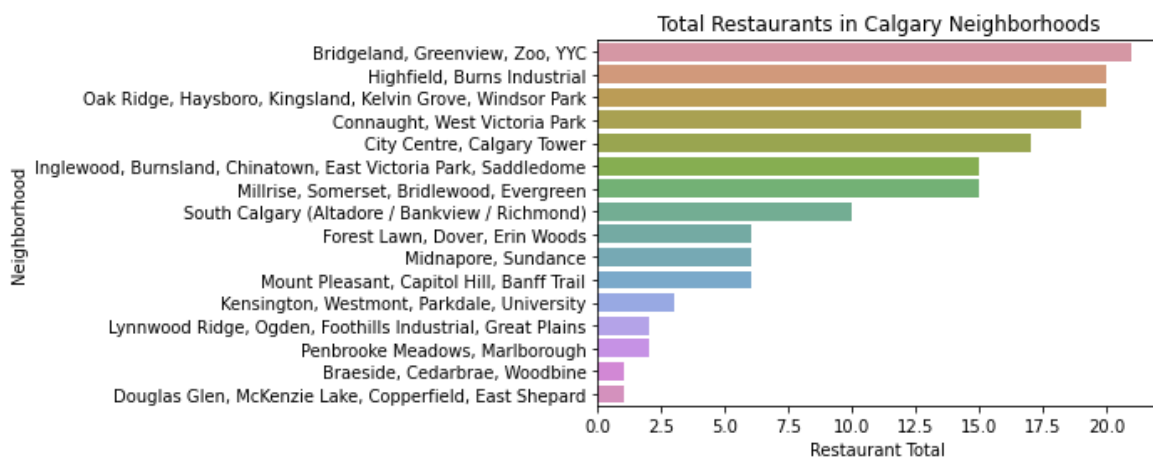


Figure 2: Total Number of Restaurants in Calgary Neighborhoods

5. Discussion

The neighborhoods with the greatest number of restaurants in Downtown Toronto are University of Toronto and Harbord, Church and Wellesley and Kensington Market, Chinatown and Grange Park. All three postal code areas have 14 restaurants in total within a 1000m radius of their coordinates. All 14 restaurants are thus, within walking distance for an individual living in the area. The neighborhoods with the greatest number of restaurants in Downtown Calgary and its surrounds are Bridgeland, Greenview, Zoo, YYC. There is a total of 20 restaurants in this postal code area. This is closely followed by the postal code area containing Highfield and Burns Industrial, with a total number of restaurants of 20.

There are 12 areas within Downtown Toronto with more than 10 restaurants within a 1000m radius of the area coordinates. There are, however, only 7 areas in Calgary where the total number of restaurants, within a 1000m radius, exceeds 10.

Calgary has the area with by far the greatest number of restaurants. However, Toronto has more areas where the total number of restaurants exceeds 10. That is, Toronto has a greater number of areas where a young Work Permit holder may expect to find job vacancies in the restaurant industry.

6. Conclusion

Although Calgary has the greatest number of restaurants in a single area, Toronto has a lot more areas where the total number of restaurants, within a 1000m radius, exceeds 10. It may be difficult for an individual on an IEC Work Permit, who has just entered Canada, to find a place to rent as they do not have a Canadian credit rating or any previous Canadian landlords to provide references. Therefore, it is important to find a city which has a number of neighborhoods where one could expect to find entry level job vacancies. Toronto provides this with 12 areas where the restaurant total exceeds 10. Toronto is thus, able to provide greater flexibility for the young worker. In addition, the young worker may wish to move neighborhoods a couple of times before settling down as they do not yet know the city.

Toronto, with its greater flexibility, appears to be the more desirable city for the young IEC Work Permit holder seeking an entry level serving position.