



12/15/2020

Prospective locations for an Italian Restaurant in Toronto

An analysis of relevant location and
Foursquare data

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INTRODUCTION

Toronto is the capital city of the Canadian province of Ontario. With a recorded population of 2,731,571 in 2016, it is the most populous city in Canada and the fourth most populous city in North America. The 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 and cosmopolitan cities in the world. Its varied cultural institutions, which include numerous museums and galleries, festivals and public events, entertainment districts, national historic sites, and sports activities, attract over 43 million tourists each year.

The diverse population of Toronto reflects its current and historical role as an important destination for immigrants to Canada. More than 50 percent of residents belong to a visible minority population group, and over 200 distinct ethnic origins are represented among its inhabitants. This ethnic diversity accounts for a remarkably diverse range of restaurants catering to a myriad of palates.

BUSINESS PROBLEM

As an up-and-coming consultancy firm in the Greater Toronto Area (GTA), you have invested heavily in Data Science and its applications. A small group of investors who are based in the restaurant business have recently approached your firm for assistance. They are thinking of opening an Italian Restaurant within the GTA and have enlisted your firm in providing information with regards to ideal locations for the restaurant. The information you provide them with will be incorporated into other factors and will be taken under advisement when they are making their decision.

DATA

The data used for this analysis is listed as follows:

- Location Data of Toronto broken down by Borough and Neighbourhood. This data was obtained by scraping the Wikipedia page - https://en.wikipedia.org/wiki/List_of_postal_codes_of_Canada.
- Geographical positioning coordinates (latitude & longitude) of the Toronto location data which was obtained using the Python Geocoder package.
- Foursquare location data. The Foursquare API was used to create a data frame of existing Italian restaurants within Toronto.
- Foursquare characteristics data which included, ratings, likes and tips of the Toronto Italian restaurants found.

METHODOLOGY

In attempting to address the business problem, the following steps were performed:

- All necessary Libraries were imported into Python. Examples included Pandas, Numpy and Folium.
- Scraping the Wikipedia page https://en.wikipedia.org/wiki/List_of_postal_codes_of_Canada to obtain the raw location data of Toronto.
- Pre-processing of the raw location data into a suitable format. Addition of longitude & Latitude and removal of Postal Codes column etc.
- Visualization of data to demonstrate the number of neighbourhoods per borough.
- Defining various functions which will be used throughout the analysis
- Defining Foursquare credentials
- Call the Foursquare API to produce a list of Italian restaurants from their database within the defined area.
- Visualization of data to illustrate the number of Italian restaurants per borough and subsequently by neighbourhood.
- Retrieval of restaurant characteristics data from Foursquare.
- Preparation of characteristic data to allow for analysis. This included changing some data types to Float allowing for statistical analysis.
- Analysis of characteristic data by category to determine a result to the business problem. Ranking of restaurants by ratings etc. to determine which locations would have less competition.

RESULTS

The initial processing of the location data for Toronto revealed that there are a total of **ten (10) Boroughs** and **one hundred and three (103) Neighbourhoods**.

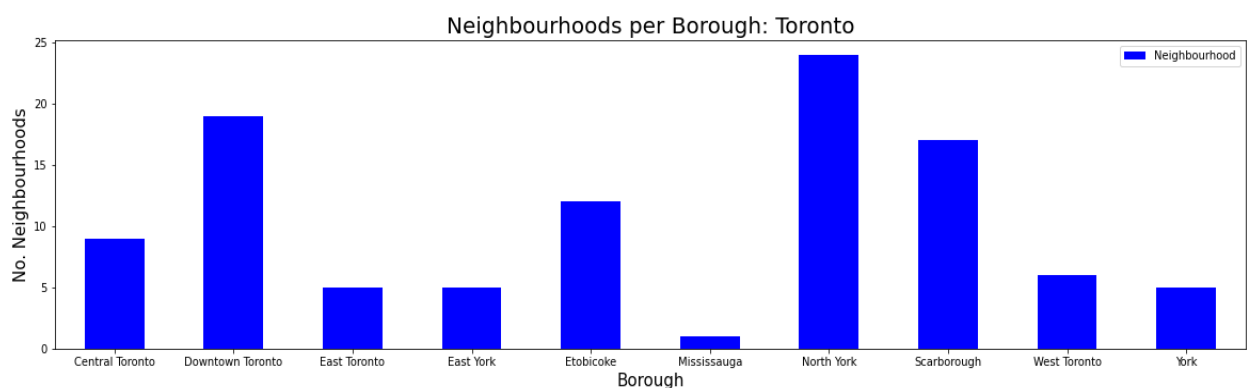


Figure 1 Breakdown of Neighbourhoods per Borough in Toronto.

The call to the Foursquare API identified **33 Italian Restaurants** in the Toronto area.

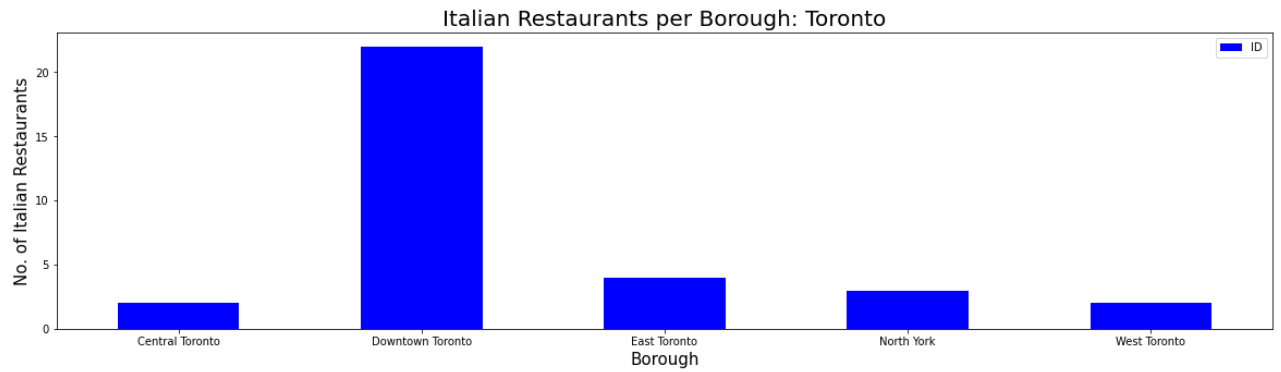


Figure 2 Breakdown of identified Italian Restaurants per Borough.

	Borough	Neighbourhood	Latitude	Longitude	Average Rating
0	North York	Bedford Park, Lawrence Manor East	43.733283	-79.419750	6.60
1	Downtown Toronto	Central Bay Street	43.657952	-79.387383	6.95
2	Downtown Toronto	Harbourfront East, Union Station, Toronto Islands	43.640816	-79.381752	6.80

Figure 3 List of the lowest rated Italian Restaurants by Borough and Neighbourhood.

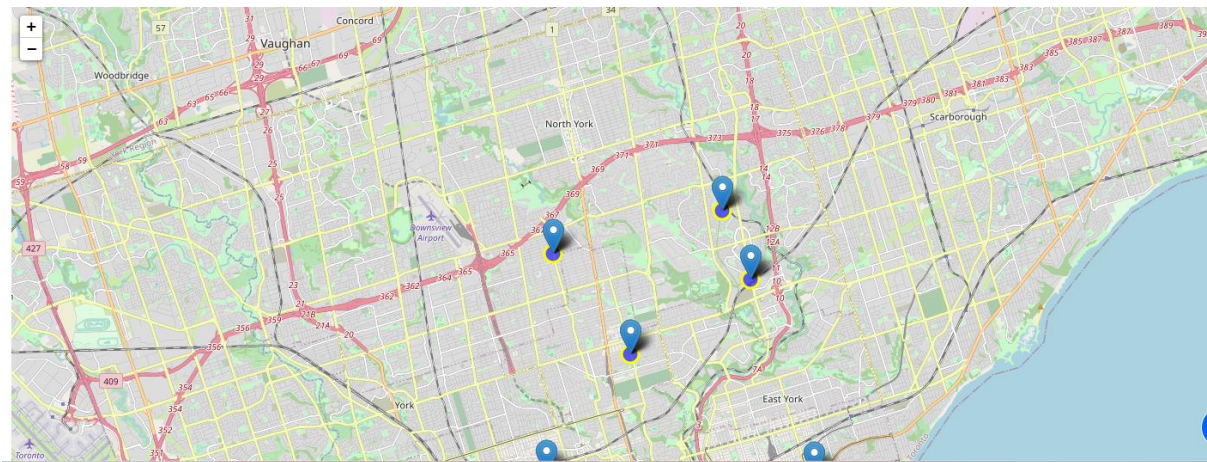


Figure 4 Map of Toronto showing sparsity of highly rated Italian Restaurants in North York

DISCUSSION

From the results, we can identify that the borough with the most neighbourhoods is North York. This would tend to suggest that there is a relatively large population of residents in this borough and by extension a high number of consumers. Similarly, Downtown Toronto had the second highest number of neighbourhoods.

Upon analysis of the Italian Restaurant data gained from Foursquare we note that there is the highest number of restaurants in Downtown Toronto, which is a reasonable statistic given the relatively high number of

Neighbourhoods. Conversely, North York had a significantly lower number of Italian Restaurants than expected given its Neighbourhood ratio.

From the average ratings data we can see that Italian Restaurants in North York had the lowest ratings out of any of the Boroughs. This would tend to suggest that any restaurant opening in this Borough would find it easier to attract patrons once it presented an adequate level of characteristics rated by customers of other restaurants in the Borough.

However, it must be noted that the criteria analysed here does not represent all the criteria one would use to determine where to open a restaurant but rather it gives supplemental information for the customer to consider. Additionally, it must be noted that this analysis depends greatly on the use of Foursquare data and its accuracy is therefore very subjective.

CONCLUSION

The evidence suggests that North York presents itself as an ideal location for an Italian Restaurant. Not only is it a highly populated borough with many neighbourhoods, but it also has a low number of existing Italian Restaurants. In addition to which those restaurants hold the lowest average rating in all of Toronto. All these factors combined make the Borough of North York an interesting candidate for consideration.