

Exploring Asian Restaurants in Toronto

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1 Introduction

1.1 Background

The Demographics of Toronto shows that it is the most populous city in Canada, with a population of 2,731,571 as of 2016. 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. 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.

While the majority of Torontonians speak English as their primary language, over 160 languages are spoken in the city. 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 city is home to the Toronto Stock Exchange, the headquarters of Canada's five largest banks, and the headquarters of many large Canadian and multinational corporations. Its economy is highly diversified with strengths in technology, design, financial services, life sciences, education, arts, fashion, aerospace, environmental innovation, food services, and tourism.

1.2 Problem

With Toronto being an important destination for tourism and immigrants to Canada as well as its high diversity in culture, comes diverse food choices/services. From the analysis in the previous assignment, it can be seen that Toronto has many restaurants belonging to different categories such as Asian, Thai, American, Chinese, etc. This project aims to visualize the locations of various Asian Restaurants in the city of Toronto.

1.3 Interest

The Asian population (immigrants), Asian tourists as well as Torontonians that favor/would like to explore Asian cuisine would be interested in the visualization of the locations of the various Asian restaurants available in Toronto. This should be useful for Asian tourists/immigrants to decide where to stay while on the trip/relocating.

2 Data acquisition and cleaning.

2.1 Data sources

Toronto data containing a list of the boroughs, postal codes and neighborhoods can be found on the Wikipedia page with the link: "https://en.wikipedia.org/w/index.php?title=List_of_postal_codes_of_Canada:_M&oldid=890001695" which will be scraped and loaded into a dataframe. The longitude and latitude for each neighbourhood can be obtained from the csv file that has the geographical coordinates of each postal code: http://cocl.us/Geospatial_data. The geospatial data would also get the Toronto Borough boundaries that will help in choropleth map visualization.

Using the Foursquare(a location data provider) API, all the Asian Restaurants can be explored/retrieved using the Client Secret and Client ID already created.

2.2 Data Cleaning

Toronto neighborhood data were scraped from the Wikipedia page to obtain the table containing Toronto boroughs, postal codes and neighbourhoods. The resulting table was then loaded into a dataframe. A dataframe containing the coordinate information of the boroughs was made by reading from a csv file provided in the geospatial link.

The postal codes that are not assigned to any neighborhood were dropped. For boroughs with "Not assigned" neighborhoods, the neighborhoods were made the same as the borough.

2.3 Feature selection

After cleaning data obtained from the Wikipedia page and merging the coordinate data frame, there were 103 samples and 5 features in the data. Four out of five features were then selected to visualize the map of Toronto and its neighborhoods.

3 Methodology

The various venues in Toronto were explored using the Foursquare API after which the number of each Venue Category was then retrieved using the count() method. The Asian restaurants in Toronto were then explored with the Foursquare API after which they were visualized on the Toronto map using the folium library to indicate the location of each Asian restaurant.

3.1 Exploratory Data Analysis

3.1.1 Counts

The number of each venue category was obtained using the count method.

3.2 Data Visualization

The map of Toronto, with the various Asian restaurants as markers, was visualized using the folium library.

4. Results

The outcome showed that there are nine hundred and eighteen (918) Asian restaurants in Toronto all located across six (6) boroughs and seventy two (72) neighborhoods.

The top Asian restaurant types include Japanese restaurant, Chinese restaurant, Thai restaurant, Indian restaurant, Korean restaurant, and Vietnamese restaurant

5 Discussion

The resulting map showing the location of each Asian restaurants in Toronto showed that most of the Asian restaurants are more concentrated in three boroughs of Toronto. These boroughs are Scarborough, North York and Downtown Toronto. However, the remaining 3 boroughs, East York, East Toronto and Central Toronto, have quite a number of Asian restaurants as well.

It can be seen that Asian restaurants are especially common in neighborhoods with Asia-related names such as China town, Little Tokyo, etc. This may suggest that more Asian restaurants are located in areas with high Asian population.

The various types of Asian restaurants and their frequency was visualized using a bar chart. This could serve as a preparation tool for Asian immigrants/tourists as well as Canadians that prefer some types of Asian cuisine.

The results of the project would help Asian tourists/immigrants choose their residential area if the available cuisine is a determining factor. It would also help non-Asians that are interested in Asian cuisine decide on what area to find Asian restaurants.

The following recommendation can be made: for Asian immigrants/tourists that would like to have easy access to Asian cuisine, because of their preference, should stay in one of the boroughs that have Asian restaurants. The top 3 boroughs (Scarborough, North York and Downtown Toronto) would be especially recommended to fulfil this desire

6 Conclusion

Asian restaurants are more concentrated in three boroughs: Scarborough, North York and Downtown Toronto. Tourists/immigrants that would like to enjoy Asian cuisine should stay in any of the 6 boroughs. Also, the most common Asian restaurant types include: Japanese, Vietnamese, Indian, Korean, Chinese and Thai restaurants.