

# Where to open an Eastern Asian Restaurant in Toronto? **Draft**

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## 1 Abstract

## 2 Introduction

### 2.1 Background

Toronto, the capital city of Ontario, the largest city in Canada, the fourth most popular city in North America, has a population of more than two million. With an annual average growth rate of 2.4% since 2009, Toronto's Gross Domestic Product (GDP) has already reached CA\$ 385.1 billion in 2016. With an extra boost from new investment in automotive manufacturing and a resurgence in immigration, the Greater Toronto Area is expected to have a growth of 4.5% in 2021.

Toronto has a strong restaurant industry. There are more than 8,100 restaurants, caterers and bars and they generate \$5.8 billion in revenues, which represents 6.5% of all businesses in Toronto. Torontonians also love to dine out. They dine out at an average of 3.1 times per week putting the city in the same ranks as Chicago (2.8), New York City (3.0) and Las Vegas (3.3).

Large population of immigrants from all over the globe has also made Toronto one of the most multicultural cities in the world. According to 2016 census, 51.5% of Toronto's population is composed of visible minorities, compared to 49.1% in 2011, and 13.6% in 1981. In terms of East Asian people, Chinese, Japanese and Korean accounts for 11.1%, 0.5% and 1.5% of Toronto's total population respectively.

### 2.2 Business Problem

With the information given in 2.1, one promising business opportunity is to open an Eastern Asian restaurant in Toronto. Thus, the **aim of this report is to find ideal neighborhoods in Toronto to open an Eastern Asian restaurant**. There are many important factors when choosing a location to open a restaurant. This report has considered population, ethnics, income, crimes, and nearby competitors of each neighborhood.

## 3 Data Acquisition and Cleaning

### 3.1 Data Source

This report used following data sets. The first two data sets are extremely large and cover almost all demographic information required for this report. The third data source provides information for nearby competitive restaurants and the fourth data set provides the coordinates of each neighbourhood in Toronto.

1. Neighbourhood Crime Rate, Toronto Police Service [HERE](#)
2. 2016 Neighbourhood Profiles, Statistics Canada [HERE](#)
3. Foursquare API Venue Search, Foursquare developer, [HERE](#)
4. Geo-spatial coordinates of neighbourhoods in Toronto, Toronto City Government, [HERE](#)

### 3.2 Data Cleaning

Data mentioned in 3.1 are mostly formatted into .csv files. These files have missing information, redundant information, misplaced information and format problems. This report has done the following data cleaning process and after data cleaning, required information are well present in Pandas DataFrames.

1. The given geo-spatial coordinates of neighbourhoods in Toronto has missing information. Totally, there are 140 neighbourhoods in Toronto and only 104 coordinates are given. The missing coordinates of neighbourhoods are manually searched and updated.
2. The 2016 Neighbourhood Profiles contains massive amount of detailed information for each neighbourhoods in respect of population, families, language, labor, housing, income, ethnic origin, education, and mobility. However, this report only requires information in respect of population, income, ethnic, and ethnic origin. Thus, certain data extraction are used to pull out useful information.
3. In the .csv files of 2016 Neighbourhood Profiles and Neighbourhood Crime Rate, there are misplaced rows and certain values are are not in correct format. In this report, numbers in .cvs files are converted to float type in Python and misplaced rows are relocated to the correct places.

### 3.3 Feature Collection

From Art gallery to Yoga studio, Foursquare API is able to return 180 unique categories of nearby venues. However, not all these categories can be considered as features. As the objective is to open an Easter Asian restaurant, only categories related to restaurant industries are considered as features. In terms of crimes, this report only consider crime types that frequently happen

in restaurants. These crimes types are Assault, AutoThef, Breakand, Robbery and TheftOver. Other considered features are the average income, population, and ethnic origin.