

The Battle of Neighborhoods A Restaurant in Toronto

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1 Introduction

Nowadays, with the requirement of consuming raising in a rapid way, we are likely to eat out frequently. For this, a lot of businessmen are now planning to open some restaurants in Toronto. More importantly, how to choose the address of these restaurants is of vital significant, which may affect the income of their business directly. Thus, in this assignment, I will use what I've already learned to help them find a relatively **good position for them to open a restaurant**.

2 Analyze of the problem

- **density of the population in the area** since we are to open a restaurant, we must focus on the issue that if the area holds the enough population so that our business is more likely to trait more consumers. for this, we need to utilize the data in the following section.
- **distribution of other restaurants** in many cases, it's not enough for us just to hold a lot potential consumers,. Because if lots of other restaurants opening here, we cannot make sure that the consumers would like to try ours. So, it's also very important for us to measure if there are a lot other restaurants.
- **tendency of consuming(eating out)** besides what we have just analyzed, people's opinion of consuming may vary from area to area. For this reason, we try to find the area that people are more likely to eat out use the API.
- **target audience** this project is useful for someone who is about to open a restaurant in Toronto. Also, please pay attention to the fact that since we are going to use the Foursquare API to analyse, our conclusions are time dependent.

3 Experimental Data

As we have analyzed, we will use the data below in our model.

- **Borough-Neighborhood information** in order to obtain the density of population, we may as well assume the neighborhood information can represent the population information in some way. We can observe the data in the link of https://en.wikipedia.org/wiki/List_of_postal_codes_of_Canada:_M. Shown as figure1
- **position information** as we have obtained the dataframe of Borough-Neighborhood information, we need to transform form them into latitude and longitude. we can simply use the Google Maps Geocoding API. As figure2

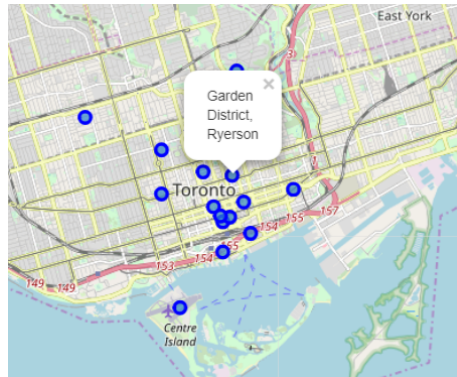
	PostalCode	Borough	Neighborhood
0	M1A	Not assigned	Not assigned
1	M2A	Not assigned	Not assigned
2	M3A	North York	Parkwoods
3	M4A	North York	Victoria Village
4	M5A	Downtown Toronto	Regent Park,Harbourfront

Figure 1: data example 1

	PostalCode	Borough	Neighborhood	Latitude	Longitude
0	M5A	Downtown Toronto	Regent Park,Harbourfront	43.654260	-79.360636
1	M5B	Downtown Toronto	Garden District, Ryerson	43.657162	-79.378937
2	M5C	Downtown Toronto	St. James Town	43.651494	-79.375418
3	M5E	Downtown Toronto	Berczy Park	43.644771	-79.373306
4	M5G	Downtown Toronto	Central Bay Street	43.657952	-79.387383

Figure 2: data example 2

- **restaurant distribution information** in this part, we can use the foursquare API and the position information combined with the folium lib, we can visualize the position of the restaurants and shops in the area (figure 3)



- **tendency of consuming (eating out)** since we just focus on the information of Toronto, it is reasonable to assume that the consuming ability is relatively the same, so that we can simplify the model and mainly focus on the position and restaurants.