Best place to open a Vietnamese restaurant in Toronto

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1. Introduction

1.1. Background

Toronto is the biggest and most dynamic city in Canada. The city is also home to many restaurants from different counties in the world. Many immigrants come to the city and open their restaurants here to introduce their country's foods to Canadian. A Vietnamese immigrant wants to open a Vietnamese restaurant in Toronto and is curious on which neighborhood is the best place to open a Vietnamese restaurant.

1.2. Problem

There are many Vietnamese restaurant in Toronto, located in various neighborhoods. As well, each neighborhood has many restaurants from other countries. This project will find out the neighborhoods that are attractive to food customers, but having no competitors, which are other Vietnamese restaurants.

1.3. Interest

Potential investors who want to invest wisely would be very interested in knowing which neighborhoods are suitable for opening their restaurants.

2. Data acquisition and cleaning

2.1. Data sources

Data on Toronto neighborhoods will be scraped from Wikipedia:
https://en.wikipedia.org/wiki/List_of_postal_codes_of_Canada:_M

Data on Vietnamese restaurants and other restaurants on each neighborhood will be obtained using foursquare API

2.2. Data cleaning

Neighborhoods and boroughs of Toronto were obtained and converted into data frame. Neighborhoods and boroughs that have not been assigned were dropped from the dataframe.

The latitude and longitude of each neighborhood was obtained from Geospatial_Coordinates.csv. The two dataframes were merged.

3. **Exploratory Data Analysis**

   3.1. **Map of neighborhoods in Toronto**

Using folium, a map of Toronto with neighborhoods were created and displayed. It can be seen that the city has 10 boroughs and 103 neighborhoods.
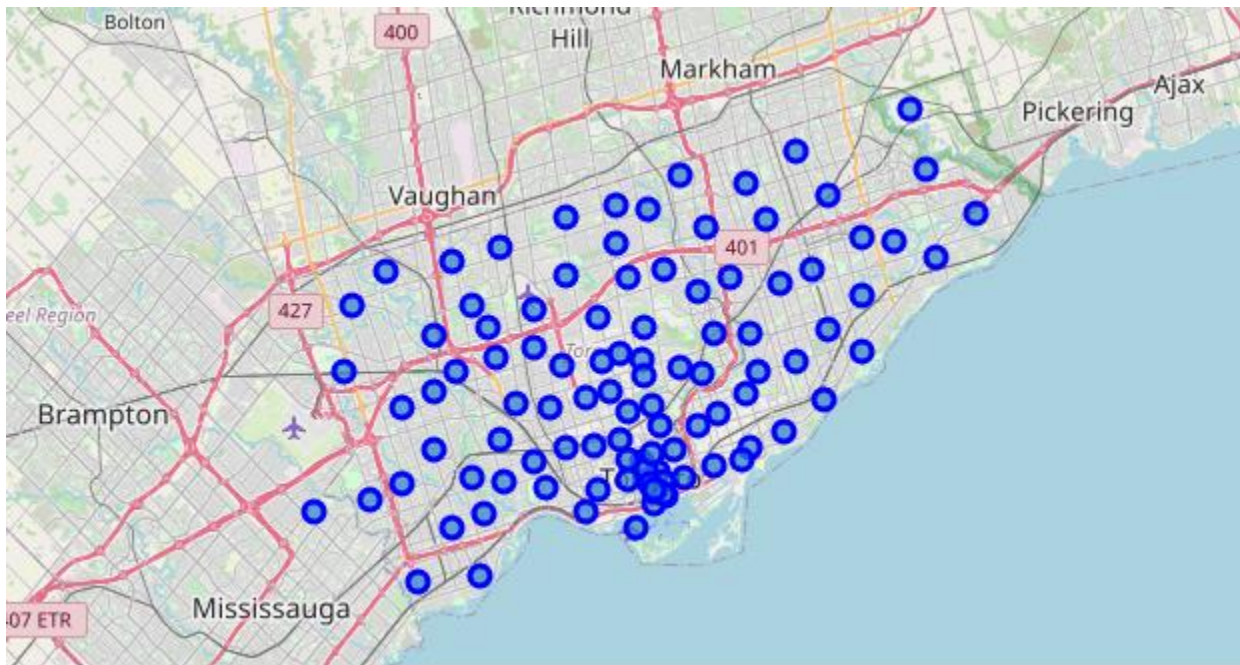

Fig. 1. Map of Toronto neighborhoods

   3.2. **Extracting restaurants for neighborhoods**

Using foursquare, the venues of each neighborhoods were obtained. Information on each venue includes Venue, Venue latitude, Venue Longitue, and Venue Category. From the dataframe, Toronto has 1163 restaurants.

Another dataframe containing information on Vietnamese restaurants in Toronto was created. There are 30 Vietnamese restaurants in the area of Toronto.

Table 1. Examples of Vietnamese restaurants in Toronto

	Neighborhood	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
0	Lawrence Manor, Lawrence Heights	43.718518	-79.464763	Lac Vien Vietnamese Restaurant	43.721259	-79.468472	Vietnamese Restaurant
1	Lawrence Manor, Lawrence Heights	43.718518	-79.464763	Viet House	43.718326	-79.457373	Vietnamese Restaurant
2	Christie	43.669542	-79.422564	Pho 88	43.664900	-79.412861	Vietnamese Restaurant
3	Dufferin, Dovercourt Village	43.669005	-79.442259	Pho Rang Dong	43.677685	-79.444113	Vietnamese Restaurant
4	Little Portugal, Trinity	43.647927	-79.419750	Pho Rua Vang (Golden Turtle)	43.646893	-79.419778	Vietnamese Restaurant

Next, all Vietnamese restaurants and Toronto neighborhoods were displayed on the map of Toronto.
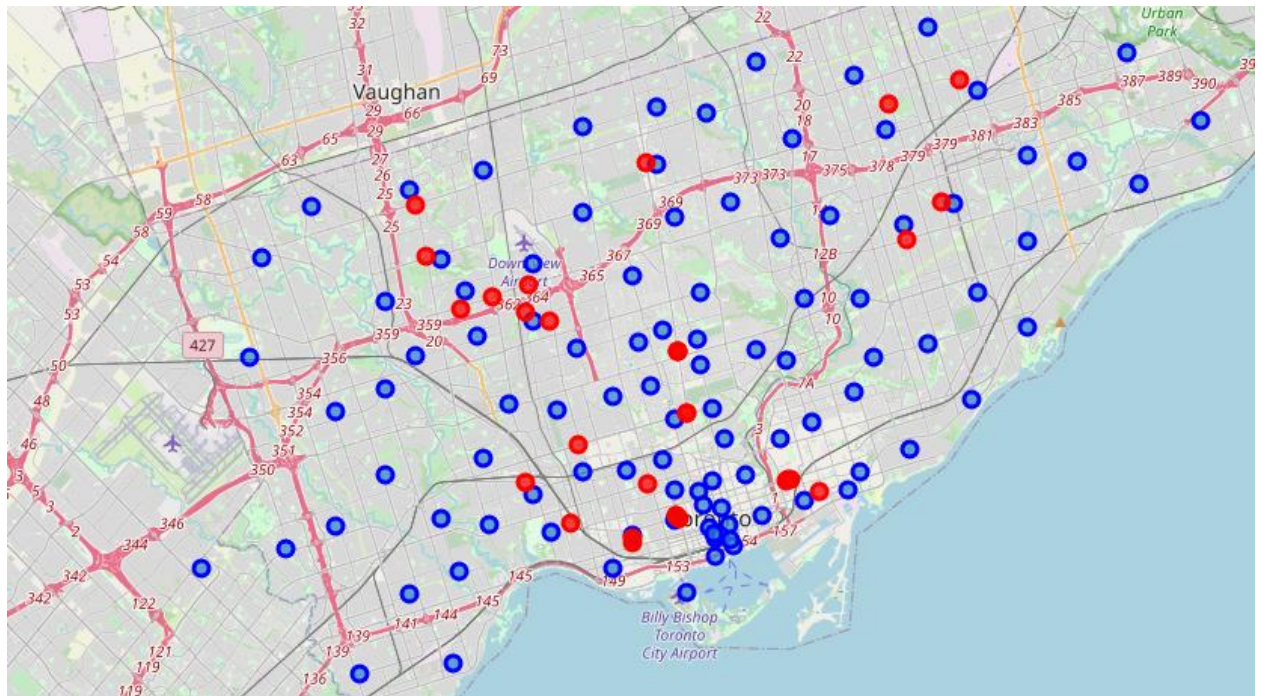

Fig. 2. Vietnamese restaurants in Toronto: Red dots = Vietnamese restaurants, blue dots = neighborhoods.

3.3. Getting the best neighborhoods

From the dataframes, the top 10 neighborhoods with most number of restaurants were selected.

	Neighborhood	Venue Category
0	Little Portugal, Trinity	18
1	Davisville	18
2	University of Toronto, Harbord	18
3	Christie	17
4	The Annex, North Midtown, Yorkville	16
5	The Danforth West, Riverdale	16
6	Kensington Market, Chinatown, Grange Park	15
7	East Toronto, Broadview North (Old East York)	15
8	Studio District	15
9	Willowdale, Willowdale East	14

Fig. 3. Neighborhoods with most numbers of restaurants

The restaurants venues are converted into 2 types: Vietnamese Restaurants and Non-Vietnamese restaurants so it's easier to analyze. For each neighborhoods, there is a percentage of Vietnamese restaurants versus Non-Vietnamese Restaurants.

	Neighborhood	Non-Vietnamese Restaurant	Vietnamese Restaurant
0	Agincourt	0.947368	0.052632
1	Alderwood, Long Branch	1.000000	0.000000
2	Bathurst Manor, Wilson Heights, Downsview North	1.000000	0.000000
3	Bayview Village	1.000000	0.000000
4	Bedford Park, Lawrence Manor East	1.000000	0.000000
...	...	...	...
85	Willowdale, Willowdale East	0.972222	0.027778
86	Willowdale, Willowdale West	1.000000	0.000000
87	Woburn	1.000000	0.000000
88	Woodbine Heights	1.000000	0.000000
89	York Mills West	1.000000	0.000000

Fig. 4. Data on Non-Vietnamese Restaurants vs Vietnamese Restaurants in neighborhoods

3.4. Getting the best neighborhoods for opening Vietnamese restaurants

The percentage of Vietnamese restaurants vs Non-Vietnamese restaurants were added to top 10 neighborhoods with the most number of restaurants. This table suggests 3 neighborhoods having no Vietnamese restaurants are best places for the business.

	Neighborhood	Venue Category	Vietnamese Restaurant
4	The Annex, North Midtown, Yorkville	16	0.000000
5	The Danforth West, Riverdale	16	0.000000
7	East Toronto, Broadview North (Old East York)	15	0.000000
1	Davisville	18	2.564103
9	Willowdale, Willowdale East	14	2.777778
3	Christie	17	2.941176
2	University of Toronto, Harbord	18	3.703704
0	Little Portugal, Trinity	18	6.451613
6	Kensington Market, Chinatown, Grange Park	15	8.333333
8	Studio District	15	14.285714

Fig. 5. Top neighborhoods with most number of restaurants and least number of Vietnamese restaurants.

4. **Conclusions**

In this study, I obtained the information on restaurants in different neighborhoods on Toronto and Vietnamese restaurants on the area too. After data filtering, three best neighborhoods were selected based on the number of restaurants of each neighborhood and the number of competitor Vietnamese restaurants. The results can be very helpful for future investors wanting to open a Vietnamese restaurant in Toronto.

5. **Future direction**

I was able to filter out the best locations based on initial hypothesis. However, there are many more factors to consider when opening a restaurant, for example, distance to center, house price, etc. which can not be addressed in this project.

This study only focused on Vietnamese restaurants, but it can be modified to be applicable for any other types of restaurants, or any other types of venues.