

Where to open a new bubble tea shop in Toronto

A. Introduction

A.1. Description & Discussion of the Background

Toronto is a multicultural city with the most population in Canada. People from all over the world come to Toronto to live, work or travel. This project is aimed to help people who wants to open a bubble tea shop in West Toronto, East Toronto, Central Toronto or Downtown Toronto to choose the right location. By examining the density of Asian restaurants and bubble tea shops, we want to find the neighborhoods with the most Asian restaurants but least bubble tea shop because of the assumption that people who are interested in Asian cuisine can also be interested in bubble tea. Moreover, by clustering all the neighborhoods in those four boroughs, we can identify different themes of each boroughs and choose the neighborhood better.

A.2. Data Description

To consider the problem we can list the data as below:

I found coordinates of each neighborhoods or districts in each borough from Wikipedia.

I used Foursquare API to get the most common venues of given neighborhoods and districts.

I used Google Map, 'Search Nearby' option to get the center coordinates of each neighborhood.

B. Methodology

As a database, I used GitHub repository in my study. My master data which has the main components *Borough*, *Neighborhood*, *Latitude* and *Longitude* information of the city.

	PostalCode	Borough	Neighborhood	Latitude	Longitude
0	M1B	Scarborough	Rouge, Malvern	43.806686	-79.194353
1	M1C	Scarborough	Highland Creek, Rouge Hill, Port Union	43.784535	-79.160497
2	M1E	Scarborough	Guildwood, Morningside, West Hill	43.763573	-79.188711
3	M1G	Scarborough	Woburn	43.770992	-79.216917
4	M1H	Scarborough	Cedarbrae	43.773136	-79.239476

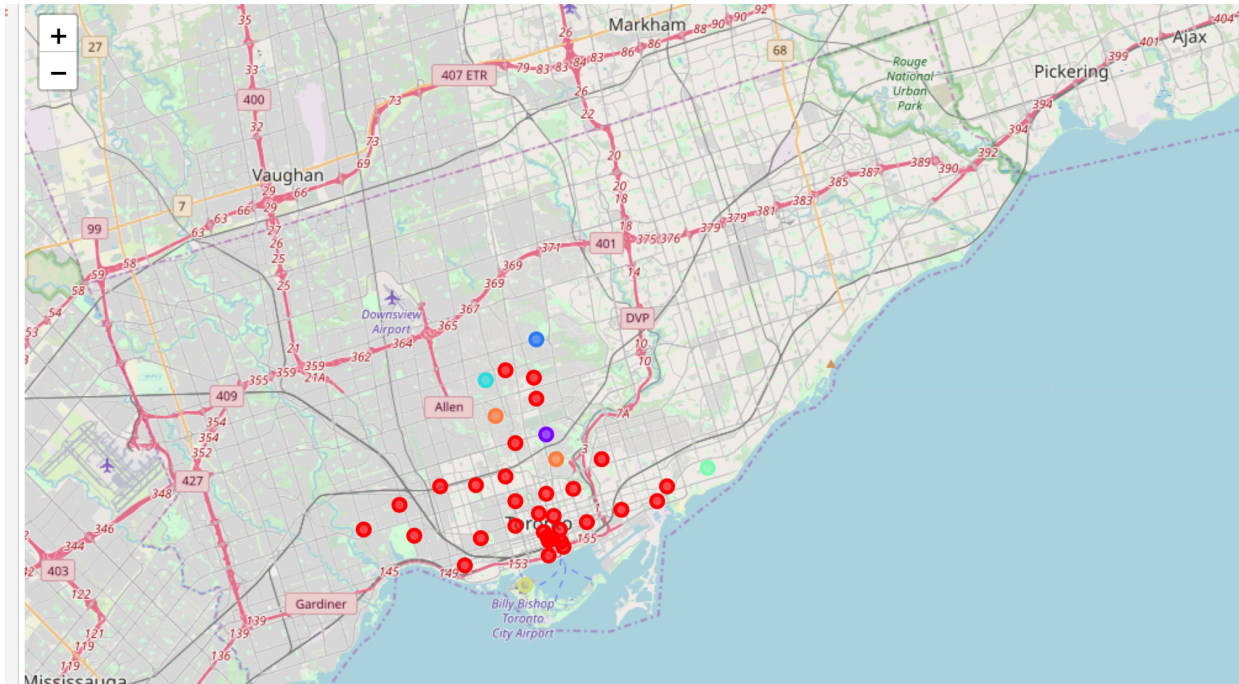
After compiling all the neighborhood information from online resources, I used Foursquare API to explore each neighborhood and find the common venue labels in the neighborhood. I set the limit as 100 venues and the radius as 750 meters for each borough using their latitude and longitude.

	name	categories	lat	lng
0	Glen Manor Ravine	Trail	43.676821	-79.293942
1	The Big Carrot Natural Food Market	Health Food Store	43.678879	-79.297734
2	Grover Pub and Grub	Pub	43.679181	-79.297215
3	Glen Stewart Ravine	Other Great Outdoors	43.676300	-79.294784
4	Upper Beaches	Neighborhood	43.680563	-79.292869

After that, I extracted information about Asian Restaurants and bubble tea shops in the neighborhoods and calculated the density of the Asian Restaurants and bubble tea shops. After comparison, neighborhoods Little Portugal and Trinity stand out with a density of 0.0483 Asian Restaurants and 0.00 bubble tea shop. To examine the location of these neighborhoods and whether they are located in commercial centers, I used unlabeled clustering to cluster the neighborhoods in these four boroughs and used python Folium library to visualize geographic details of the borough clustering.

	Neighborhood	Asian Restaurant	Bubble Tea Shop
0	Adelaide, King, Richmond	0.020000	0.000000
1	Berczy Park	0.000000	0.000000
2	Brockton, Exhibition Place, Parkdale Village	0.000000	0.000000
3	Business Reply Mail Processing Centre 969 Eastern	0.000000	0.000000
4	CN Tower, Bathurst Quay, Island airport, Harbo...	0.000000	0.000000
5	Cabbagetown, St. James Town	0.000000	0.000000
6	Central Bay Street	0.000000	0.022727
7	Chinatown, Grange Park, Kensington Market	0.000000	0.010000
8	Christie	0.000000	0.000000
9	Church and Wellesley	0.000000	0.022989
10	Commerce Court, Victoria Hotel	0.010000	0.000000
11	Davisville	0.000000	0.000000
12	Davisville North	0.000000	0.000000
13	Deer Park, Forest Hill SE, Rathnelly, South Hi...	0.000000	0.000000
14	Design Exchange, Toronto Dominion Centre	0.010000	0.000000

	PostalCode	Borough	Neighborhood	Latitude	Longitude	Cluster Labels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue
0	M4E	East Toronto	The Beaches	43.676357	-79.293031	4	Health Food Store	Other Great Outdoors	Pub	Trail	Falafel Restaurant	Event Space	Farmers Market
1	M4K	East Toronto	The Danforth West, Riverdale	43.679557	-79.352188	0	Greek Restaurant	Coffee Shop	Ice Cream Shop	Italian Restaurant	Furniture / Home Store	Yoga Studio	Bookstore
2	M4L	East Toronto	The Beaches West, India Bazaar	43.668999	-79.315572	0	Park	Pizza Place	Sushi Restaurant	Ice Cream Shop	Italian Restaurant	Fish & Chips Shop	Fast Food Restaurant
3	M4M	East Toronto	Studio District	43.659526	-79.340923	0	Café	Coffee Shop	Gastropub	Italian Restaurant	Bakery	American Restaurant	Yoga Studio
4	M4N	Central Toronto	Lawrence Park	43.728020	-79.388790	2	Park	Swim School	Bus Line	Women's Store	Discount Store	Fast Food Restaurant	Farmers Market



C. Results

Based on the analysis above, the result is that neighborhoods Little Portugal and Trinity have the most Asian Restaurants and least bubble tea shops. They are both located in West Toronto which has a high density of population. They all belong to the clustering labeled as commercial centers.

----Little Portugal, Trinity----		
	venue	freq
0	Bar	0.13
1	Asian Restaurant	0.05
2	Men's Store	0.05
3	Coffee Shop	0.05
4	New American Restaurant	0.03
5	Restaurant	0.03
6	Pizza Place	0.03
7	Bakery	0.03
8	Vietnamese Restaurant	0.03
9	Cocktail Bar	0.03

22	Lawrence Park	0.000000	0.000000
23	Little Portugal, Trinity	0.048387	0.000000
24	Moore Park, Summerhill East	0.000000	0.000000

D. Discussion

Based on the analysis above, the best neighborhoods to open new bubble tea shops are Little Portugal and Trinity. They are both located in West Toronto which has many commercial centers and are close to downtown. Moreover, the neighborhoods have many Asian Restaurants but no bubble tea shops.

The suggestion for people who want to open new bubble tea shop in Toronto is to set these two neighborhoods as priorities to do investigation and select proper venue for the new shop.

E. Conclusion

Using clustering to find the theme of different boroughs has a broad application. This project is just an example of it. To explore more on this business case, we can take more factors into consideration such as renting prices, distance to the center of Toronto, access to transportation, etc. With more factors, we can establish a more comprehensive model to evaluate each neighborhood and find out the best venue.