



Capstone Project – The Battle of Neighborhoods

Select the best neighborhoods for a new bubble tea shop in Toronto

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Introduction

- ❖ Toronto is the financial capital of Canada. It has diverse cultures and enormous potential for new businesses.
- ❖ Bubble tea, a popular Taiwanese tea-based drink has been popular throughout the world.
- ❖ A growing number of bubble tea shops have popped up in Toronto.
- ❖ Find a good location to open a new bubble tea shop.
- ❖ Goal: Open a new bubble tea shop in Toronto

Data

Toronto boroughs and neighborhoods

Postcode	Borough	Neighbourhood
M1A	Not assigned	Not assigned
M2A	Not assigned	Not assigned
M3A	North York	Parkwoods
M4A	North York	Victoria Village
M5A	Downtown Toronto	Harbourfront
M5A	Downtown Toronto	Regent Park
M6A	North York	Lawrence Heights
M6A	North York	Lawrence Manor
M7A	Queen's Park	Not assigned
M8A	Not assigned	Not assigned
M9A	Etobicoke	Islington Avenue

Data

Toronto geographical data
corresponding to postal codes

	Postal Code	Latitude	Longitude
0	M1B	43.806686	-79.194353
1	M1C	43.784535	-79.160497
2	M1E	43.763573	-79.188711
3	M1G	43.770992	-79.216917
4	M1H	43.773136	-79.239476
5	M1J	43.744734	-79.239476
6	M1K	43.727929	-79.262029
7	M1L	43.711112	-79.284577
8	M1M	43.716316	-79.239476
9	M1N	43.692657	-79.264848

Data

Merge the dataset

	Postcode	Borough	Neighbourhood	Latitude	Longitude
0	M3A	North York	Parkwoods	43.753259	-79.329656
1	M4A	North York	Victoria Village	43.725882	-79.315572
2	M5A	Downtown Toronto	Harbourfront,Regent Park	43.654260	-79.360636
3	M6A	North York	Lawrence Heights,Lawrence Manor	43.718518	-79.464763
4	M7A	Queen's Park	Queen's Park	43.662301	-79.389494

Data

Bubble tea shop information
retrieved by FourSquare Api

	Neighborhood	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
0	Harbourfront,Regent Park	43.65426	-79.360636	Chatime 日出茶太	43.655542	-79.384684	Bubble Tea Shop
1	Harbourfront,Regent Park	43.65426	-79.360636	The Alley	43.665922	-79.385567	Bubble Tea Shop
2	Harbourfront,Regent Park	43.65426	-79.360636	Sharetea	43.640176	-79.379606	Bubble Tea Shop
3	Harbourfront,Regent Park	43.65426	-79.360636	Bubble Republic Tea House 奶茶黨部	43.656707	-79.384165	Bubble Tea Shop
4	Harbourfront,Regent Park	43.65426	-79.360636	Tika Tea House	43.668797	-79.386010	Bubble Tea Shop

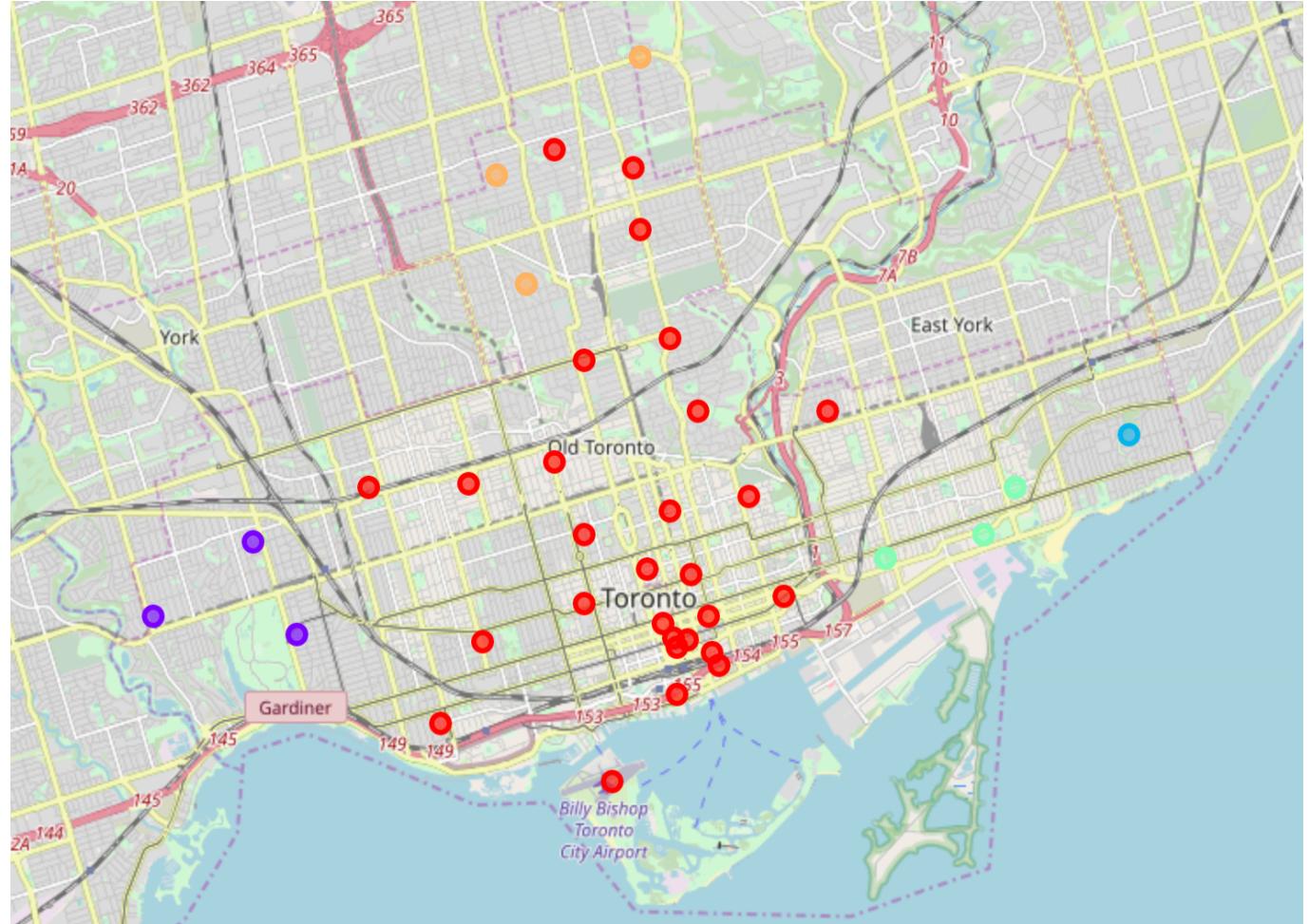
Methodology

- ❖ Filter the dataset to only contain boroughs:
 - Downtown Toronto
 - East Toronto
 - West Toronto
 - Central Toronto
- ❖ Use FourSquare api to find bubble tea shops around each neighborhoods. We set radius to be 3000 meters and limit to be 100.

	Neighborhood	Asian Restaurant	Bakery	Bubble Tea Shop	Café	Chinese Restaurant	Dessert Shop	Frozen Yogurt Shop	Juice Bar	Tea Room	Vietnamese Restaurant
0	Adelaide,King,Richmond	0.014493	0.014493	0.826087	0.028986	0.014493	0.014493	0.000000	0.028986	0.028986	0.028986
1	Berczy Park	0.015873	0.031746	0.777778	0.031746	0.031746	0.015873	0.000000	0.031746	0.031746	0.031746
2	Brockton,Exhibition Place,Parkdale Village	0.000000	0.000000	0.818182	0.000000	0.000000	0.000000	0.000000	0.000000	0.090909	0.090909
3	Business Reply Mail Processing Centre 969 Eastern	0.200000	0.200000	0.400000	0.000000	0.200000	0.000000	0.000000	0.000000	0.000000	0.000000
4	CN Tower,Bathurst Quay,Island airport,Harbour...	0.034483	0.000000	0.724138	0.034483	0.000000	0.000000	0.000000	0.068966	0.068966	0.068966
5	Cabbagetown,St. James Town	0.018182	0.036364	0.781818	0.036364	0.036364	0.018182	0.000000	0.036364	0.018182	0.018182
6	Central Bay Street	0.014085	0.028169	0.802817	0.028169	0.028169	0.014085	0.000000	0.028169	0.028169	0.028169
7	Chinatown,Grange Park,Kensington Market	0.014493	0.014493	0.826087	0.028986	0.014493	0.014493	0.000000	0.028986	0.028986	0.028986
8	Christie	0.033333	0.000000	0.800000	0.033333	0.033333	0.000000	0.000000	0.000000	0.066667	0.033333
9	Church and Wellesley	0.014085	0.028169	0.802817	0.028169	0.028169	0.014085	0.000000	0.028169	0.028169	0.028169
10	Commerce Court,Victoria Hotel	0.015385	0.030769	0.784615	0.030769	0.030769	0.015385	0.000000	0.030769	0.030769	0.030769
11	Davisville	0.000000	0.000000	0.833333	0.000000	0.000000	0.000000	0.000000	0.000000	0.166667	0.000000
12	Davisville North	0.000000	0.000000	0.833333	0.000000	0.000000	0.000000	0.000000	0.000000	0.166667	0.000000

Methodology

- ❖ K-means to cluster the neighborhoods to 5 clusters
- ❖ Visualize the 5 clusters using the Folium library



Methodology

- ❖ Further investigate the other types of venues around cluster 2, 3, 4 and 5 neighborhoods.
- ❖ Get the top 10 most common venues of the above neighborhoods to understand people's preferences further

Neighborhood	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	8th Most Common Venue	9th Most Common Venue	10th Most Common Venue
0 Business Reply Mail Processing Centre 969 Eastern	Grocery Store	Café	Park	Convenience Store	Coffee Shop	Nightclub	Athletics & Sports	Baby Store	Diner	Restaurant
1 Forest Hill North,Forest Hill West	Coffee Shop	Hotel	Aquarium	Café	Italian Restaurant	Bakery	Scenic Lookout	Sporting Goods Shop	Pizza Place	Brewery
2 High Park,The Junction South	Coffee Shop	Bakery	Café	Park	Mexican Restaurant	Pub	Breakfast Spot	Farmers Market	Event Space	Electronics Store
3 Lawrence Park	Coffee Shop	Café	Steakhouse	Thai Restaurant	Bar	American Restaurant	Restaurant	Breakfast Spot	Asian Restaurant	Hotel
4 Parkdale,Roncesvalles	Coffee Shop	Clothing Store	Cosmetics Shop	Café	Middle Eastern Restaurant	Bubble Tea Shop	Ramen Restaurant	Japanese Restaurant	Italian Restaurant	Ice Cream Shop
5 Roselawn	Pharmacy	Bakery	Supermarket	Music Venue	Middle Eastern Restaurant	Café	Brewery	Bar	Bank	Park
6 Runnymede,Swansea	Coffee Shop	Hotel	Café	Restaurant	Italian Restaurant	Clothing Store	Cocktail Bar	Gastropub	Breakfast Spot	Cosmetics Shop
7 Studio District	Coffee Shop	Café	Ice Cream Shop	Italian Restaurant	Sandwich Place	Burger Joint	Indian Restaurant	Spa	Salad Place	Middle Eastern Restaurant
8 The Beaches	Health Food Store	Other Great Outdoors	Trail	Pub	Deli / Bodega	Eastern European Restaurant	Donut Shop	Discount Store	Diner	Dessert Shop
9 The Beaches West,India Bazaar	Coffee Shop	Cocktail Bar	Beer Bar	Seafood Restaurant	Cheese Shop	Café	Farmers Market	Bakery	Steakhouse	Clothing Store

Results

Cluster 1

(Note: the first group is relatively large, we show the snippet of this cluster)

	Neighbourhood	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	8th Most Common Venue	9th Most Common Venue	10th Most Common Venue
0	Harbourfront,Regent Park	Bubble Tea Shop	Tea Room	Juice Bar	Café	Bakery	Vietnamese Restaurant	Dessert Shop	Chinese Restaurant	Frozen Yogurt Shop	Asian Restaurant
1	Ryerson,Garden District	Bubble Tea Shop	Vietnamese Restaurant	Tea Room	Juice Bar	Chinese Restaurant	Café	Bakery	Dessert Shop	Asian Restaurant	Frozen Yogurt Shop
2	St. James Town	Bubble Tea Shop	Vietnamese Restaurant	Tea Room	Juice Bar	Chinese Restaurant	Café	Bakery	Dessert Shop	Asian Restaurant	Frozen Yogurt Shop
4	Berczy Park	Bubble Tea Shop	Vietnamese Restaurant	Tea Room	Juice Bar	Chinese Restaurant	Café	Bakery	Dessert Shop	Asian Restaurant	Frozen Yogurt Shop
5	Central Bay Street	Bubble Tea Shop	Vietnamese Restaurant	Tea Room	Juice Bar	Chinese Restaurant	Café	Bakery	Dessert Shop	Asian Restaurant	Frozen Yogurt Shop
6	Christie	Bubble Tea Shop	Tea Room	Vietnamese Restaurant	Chinese Restaurant	Café	Asian Restaurant	Juice Bar	Frozen Yogurt Shop	Dessert Shop	Bakery
7	Adelaide,King,Richmond	Bubble Tea Shop	Vietnamese Restaurant	Tea Room	Juice Bar	Café	Dessert Shop	Chinese Restaurant	Bakery	Asian Restaurant	Frozen Yogurt Shop
8	Dovercourt Village,Dufferin	Bubble Tea Shop	Vietnamese Restaurant	Tea Room	Juice Bar	Frozen Yogurt Shop	Dessert Shop	Chinese Restaurant	Café	Bakery	Asian Restaurant
9	Harbourfront East,Toronto Islands,Union Station	Bubble Tea Shop	Vietnamese Restaurant	Tea Room	Juice Bar	Café	Dessert Shop	Chinese Restaurant	Bakery	Asian Restaurant	Frozen Yogurt Shop
10	Little Portugal,Trinity	Bubble Tea Shop	Vietnamese Restaurant	Tea Room	Juice Bar	Chinese Restaurant	Café	Asian Restaurant	Frozen Yogurt Shop	Dessert Shop	Bakery

Results

Cluster 2

Neighbourhood	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	8th Most Common Venue	9th Most Common Venue	10th Most Common Venue
21 High Park,The Junction South	Bubble Tea Shop	Tea Room	Frozen Yogurt Shop	Vietnamese Restaurant	Juice Bar	Dessert Shop	Chinese Restaurant	Café	Bakery	Asian Restaurant
24 Parkdale,Roncesvalles	Bubble Tea Shop	Tea Room	Frozen Yogurt Shop	Vietnamese Restaurant	Juice Bar	Dessert Shop	Chinese Restaurant	Café	Bakery	Asian Restaurant
27 Runnymede,Swansea	Tea Room	Frozen Yogurt Shop	Bubble Tea Shop	Vietnamese Restaurant	Juice Bar	Dessert Shop	Chinese Restaurant	Café	Bakery	Asian Restaurant

Results

Cluster 3

Neighbourhood	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	8th Most Common Venue	9th Most Common Venue	10th Most Common Venue
3 The Beaches	Bubble Tea Shop	Asian Restaurant	Vietnamese Restaurant	Tea Room	Juice Bar	Frozen Yogurt Shop	Dessert Shop	Chinese Restaurant	Café	Bakery

Results

Cluster 4

Neighbourhood	1st Most Common	2nd Most Common	3rd Most Common	4th Most Common	5th Most Common	6th Most Common	7th Most Common	8th Most Common	9th Most Common	10th Most Common
	Venue	Venue	Venue	Venue	Venue	Venue	Venue	Venue	Venue	Venue
14 The Beaches West, India Bazaar	Chinese Restaurant	Bubble Tea Shop	Asian Restaurant	Vietnamese Restaurant	Tea Room	Juice Bar	Frozen Yogurt Shop	Dessert Shop	Café	Bakery
16 Studio District	Bubble Tea Shop	Chinese Restaurant	Bakery	Vietnamese Restaurant	Tea Room	Juice Bar	Frozen Yogurt Shop	Dessert Shop	Café	Asian Restaurant
37 Business Reply Mail Processing Centre 969 Eastern	Bubble Tea Shop	Chinese Restaurant	Bakery	Asian Restaurant	Vietnamese Restaurant	Tea Room	Juice Bar	Frozen Yogurt Shop	Dessert Shop	Café

Results

Cluster 5

Neighbourhood		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	8th Most Common Venue	9th Most Common Venue	10th Most Common Venue
17	Lawrence Park	Bubble Tea Shop	Tea Room	Vietnamese Restaurant	Juice Bar	Frozen Yogurt Shop	Dessert Shop	Chinese Restaurant	Café	Bakery	Asian Restaurant
18	Roselawn	Bubble Tea Shop	Tea Room	Vietnamese Restaurant	Juice Bar	Frozen Yogurt Shop	Dessert Shop	Chinese Restaurant	Café	Bakery	Asian Restaurant
20	Forest Hill North Forest Hill West	Tea Room	Bubble Tea Shop	Vietnamese Restaurant	Juice Bar	Frozen Yogurt Shop	Dessert Shop	Chinese Restaurant	Café	Bakery	Asian Restaurant

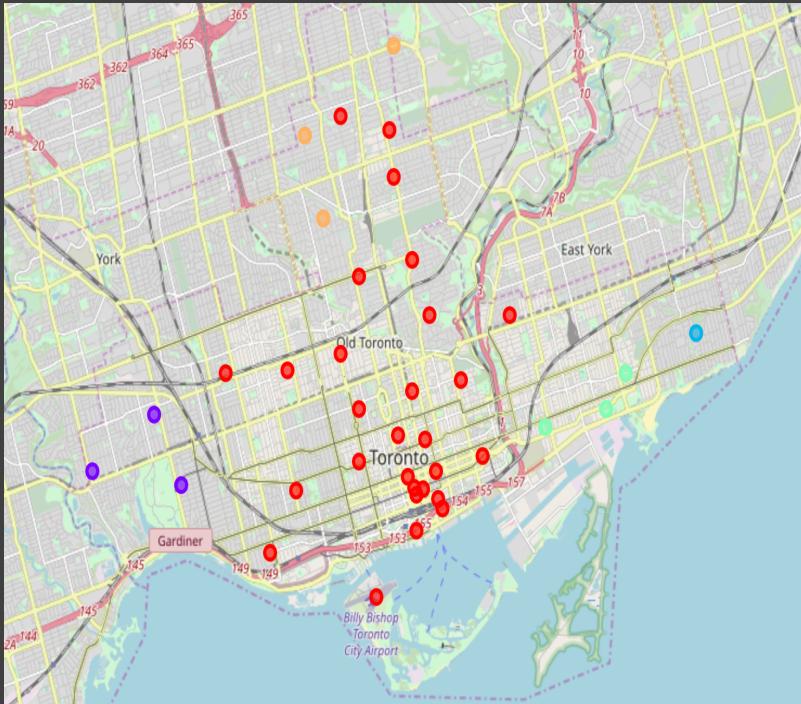
Results

Top 10 venues around cluster 2, 3, 4 and 5 neighborhoods

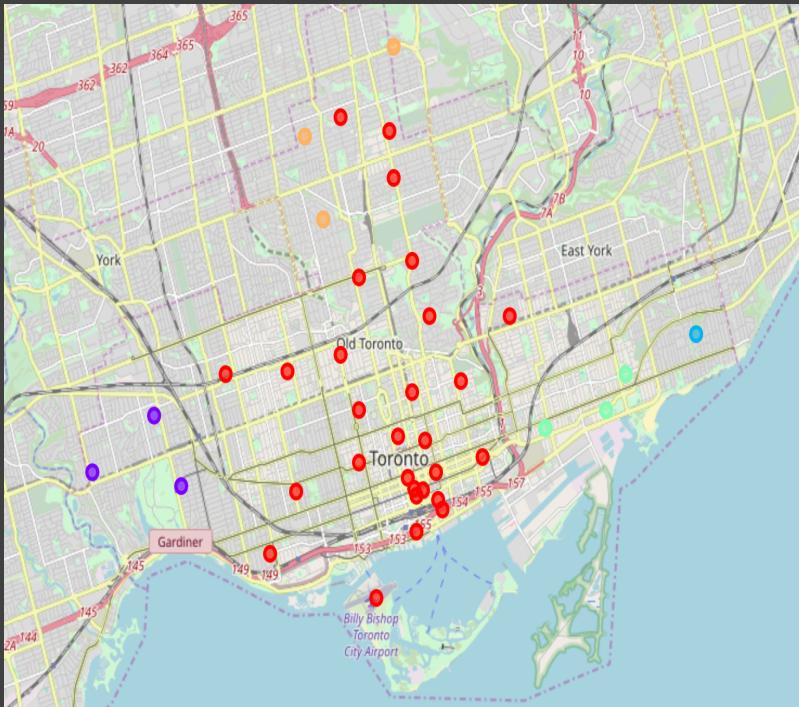
Neighborhood	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue	9th Most Common Venue	10th Most Common Venue
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Discussion

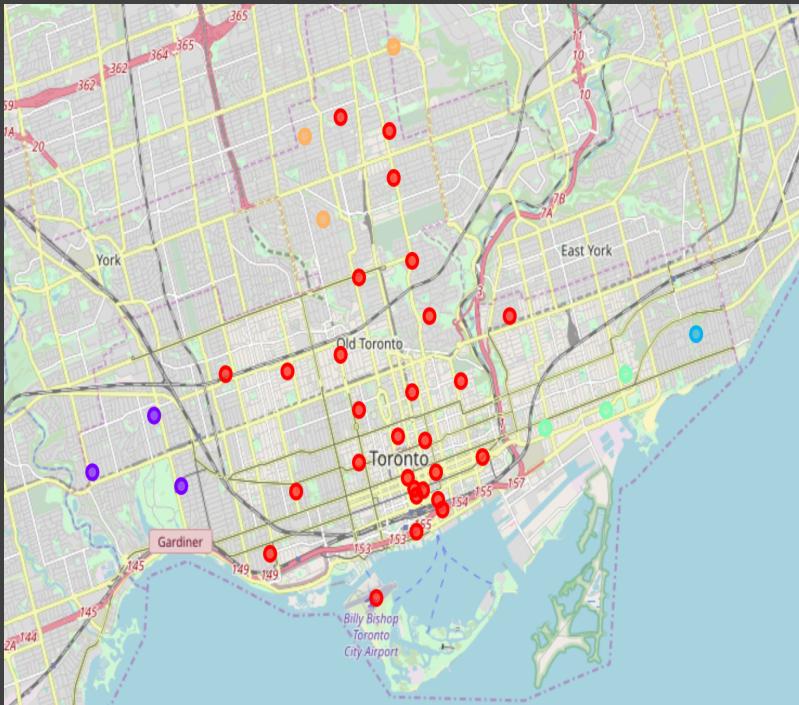
- ❖ Cluster 2, 3, 4, 5 neighbourhoods have relatively fewer bubble tea shops. There are fewer competitors nearby.
- ❖ We exclude cluster 1 neighborhoods since there are already a lot of bubble tea shops and the chance of surviving through the competition is relatively low.



Discussion



Discussion



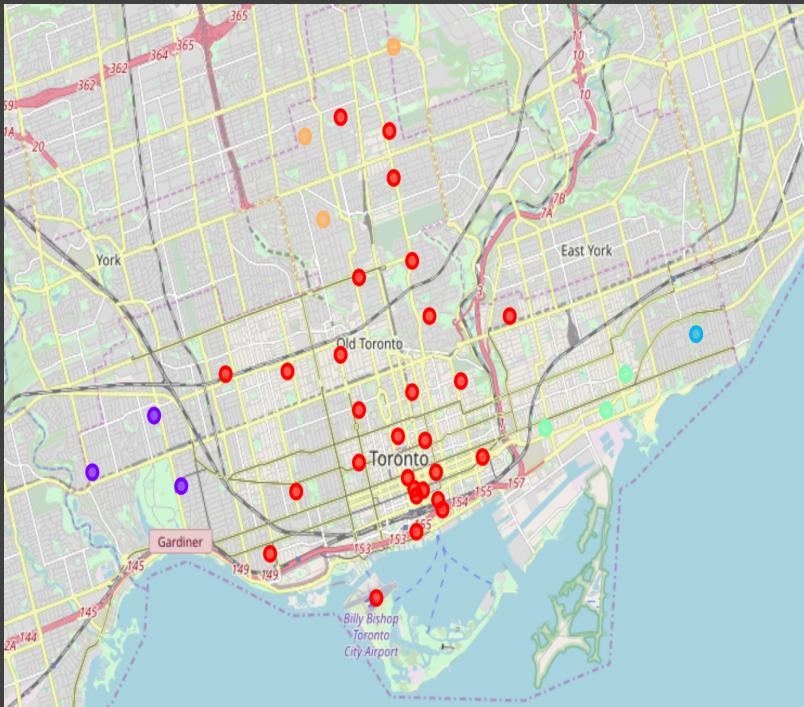
Cluster 4 neighbourhoods:

1. The Beaches West, India Bazaar
 2. Studio District
 3. Business Reply Mail Processing Centre 969 Eastern
- There are coffee shops, cafes in these locations which means people enjoy coffee at these places.
 - However, there are also beer bars, nightclubs, western style food restaurants at these places, indicating people visiting these places enjoy adult style drinks more often and preferring western style food than Taiwanese bubble tea.

Cluster 5 neighbourhoods:

1. Forest Hill North, Forest Hill West
 2. Lawrence Park
 3. Roselawn
- There are coffee shops, hotels, supermarkets and Asian style restaurants in these places.
 - People visiting these places may spend more time and enjoy a cup of bubble tea. .

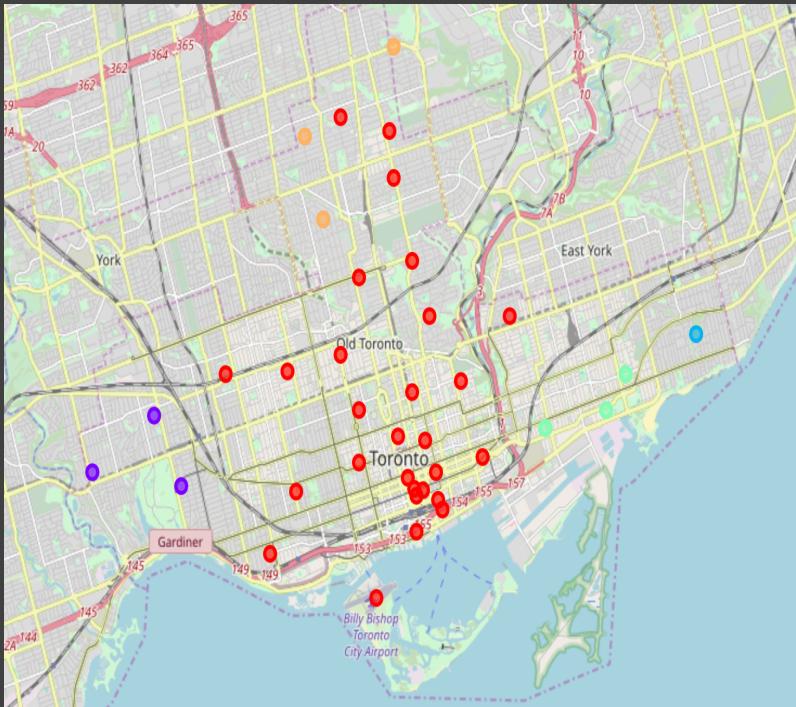
Discussion



Cluster 5 neighbourhoods:

1. Forest Hill North, Forest Hill West
 2. Lawrence Park
 3. Roselawn
- There are coffee shops, hotels, supermarkets and Asian style restaurants in these places.
 - People visiting these places spend more time and enjoy a cup of bubble tea.
 - These are **good** locations for a bubble tea shop.

Conclusion



- ❖ We investigate the borough Downtown Toronto, East Toronto, West Toronto and Central Toronto to find a location for our new bubble tea shop.
- ❖ Cluster 2 and cluster 5 neighbourhoods are better choices to open a new bubble tea shop.
 - ✓ *High Park, The Junction South*
 - ✓ *Parkdale, Roncesvalles*
 - ✓ *Runnymede, Swansea*
 - ✓ *Forest Hill North, Forest Hill West*
 - ✓ *Lawrence Park*
 - ✓ *Roselawn*
- ❖ Limitation:
 - Demographics data
 - Crime data
 - More data...
- ❖ We found better locations for a new bubble tea shop. However, the results can be further improved with more data.



Thank you!!