

Capstone Project

Battle of Neighborhoods

Background & Problem Description

A young couple recently moved from Paris to Toronto and they are looking for a right location to open their first juice bar in the city. As Toronto is one of the most diverse and populous cities in Canada, there are lots of business opportunities in various industries, be it banking & finance, tourism, arts & music etc. People from all over the world fly to Toronto on daily basis for conferences / business meetings / traveling, thus giving rise to lots of famous food & drink places. Though there are plenty of options in front of this couple, making decisions is not easy. The market in Toronto is highly developed and thus, comes with intense competition and high investment cost.

Being attracted by the potential return but scared of choosing the wrong neighborhoods, they decided to hire a team of data analysts to conduct detailed research on the Toronto market and suggest a location that provides space for business growth and has a nice environment that support business operations.

Factors we need to consider in our analysis

- where's the supply comes from? Venues in each neighborhood e.g. grocery stores that will support the running of juice bar business.
- where's the demand comes from? What's the level of competition in each neighborhood e.g. looking at the number of juice bars in each neighborhood to determine the saturation of market.

Our Goal

At the end of project, we want to help this couple find the right location to open their juice bar based on market saturation and supply of resources to run the business.

Data Description & Approach

1. Wikipedia:

We will extract a list of Canada postal codes from Wikipedia so we can build a dataframe of the postal code of each neighborhood along with the borough name and neighborhood name. In total, there are 5 boroughs and 306 neighborhoods in the dataset.

2. http://cocl.us/Geospatial_data

In order to utilize the Foursquare location data, we need to get the latitude and the longitude coordinates of each neighborhood. The website above will provide us the geospatial data needed to input into Foursquare.

3. Foursquare

Once we have the latitude and longitude coordinates, we can make use of Foursquare API to find out more about the venues in each neighborhood. We will look at the top venues in each neighborhood and search for key words such as grocery stores, juice bars etc.

Methodology

- Extract the raw data from Wikipedia website
- Create a dataframe from the raw data including the following columns - postal code, borough, and neighborhood information

	Postalcode	Borough	Neighborhood
0	M3A	North York	Parkwoods
1	M4A	North York	Victoria Village
2	M5A	Downtown Toronto	Regent Park, Harbourfront
3	M6A	North York	Lawrence Manor, Lawrence Heights
4	M7A	Downtown Toronto	Queen's Park, Ontario Provincial Government
5	M9A	Etobicoke	Islington Avenue, Humber Valley Village

- Get the latitude and the longitude coordinates of each neighborhood
- Explore the neighborhoods in Toronto by using data from Foursquare

	Postalcode	Borough	Neighborhood	Latitude	Longitude
37	M4E	East Toronto	The Beaches	43.676357	-79.293031
41	M4K	East Toronto	The Danforth West, Riverdale	43.679557	-79.352188
42	M4L	East Toronto	India Bazaar, The Beaches West	43.668999	-79.315572
43	M4M	East Toronto	Studio District	43.659526	-79.340923
44	M4N	Central Toronto	Lawrence Park	43.728020	-79.388790

Venues Profile

Foursquare allow us to find out more about the number of different venues in each neighborhood and thus, evaluating the level of competition and potential business opportunities in each neighborhood.

	Neighborhood	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
0	The Beaches	43.676357	-79.293031	Glen Manor Ravine	43.676821	-79.293942	Trail
1	The Beaches	43.676357	-79.293031	The Big Carrot Natural Food Market	43.678879	-79.297734	Health Food Store
2	The Beaches	43.676357	-79.293031	Grover Pub and Grub	43.679181	-79.297215	Pub
3	The Beaches	43.676357	-79.293031	Upper Beaches	43.680563	-79.292869	Neighborhood
4	The Danforth West, Riverdale	43.679557	-79.352188	MenEssentials	43.677820	-79.351265	Cosmetics Shop
5	The Danforth West, Riverdale	43.679557	-79.352188	Pantheon	43.677621	-79.351434	Greek Restaurant
6	The Danforth West, Riverdale	43.679557	-79.352188	Cafe Fiorentina	43.677743	-79.350115	Italian Restaurant
7	The Danforth West, Riverdale	43.679557	-79.352188	Dolce Gelato	43.677773	-79.351187	Ice Cream Shop
8	The Danforth West, Riverdale	43.679557	-79.352188	La Diperie	43.677530	-79.352295	Ice Cream Shop
9	The Danforth West, Riverdale	43.679557	-79.352188	Moksha Yoga Danforth	43.677622	-79.352116	Yoga Studio

Evaluation Criteria

The most important selection criterion in our analysis is the number of juice bars in each neighborhood. We want to find the neighborhoods with the least number of juice bars, which suggest those neighborhoods have more business opportunities compared to others.

	Neighborhood	1st Least Common Venue	2nd Least Common Venue	3rd Least Common Venue	4th Least Common Venue	5th Least Common Venue	6th Least Common Venue	7th Least Common Venue	8th Least Common Venue	9th Least Common Venue	10th Least Common Venue
4	Central Bay Street	Afghan Restaurant	Juice Bar	Lake	Latin American Restaurant	Light Rail Station	Lingerie Store	Liquor Store	Lounge	Malay Restaurant	Market
7	Commerce Court, Victoria Hotel	Afghan Restaurant	Juice Bar	Korean Restaurant	Lake	Light Rail Station	Lingerie Store	Liquor Store	Lounge	Malay Restaurant	Market
11	First Canadian Place, Underground city	Afghan Restaurant	Jazz Club	Jewelry Store	Juice Bar	Korean Restaurant	Lake	Latin American Restaurant	Light Rail Station	Lingerie Store	Liquor Store
14	Harbourfront East, Union Station, Toronto Islands	Afghan Restaurant	Intersection	Irish Pub	Jazz Club	Jewelry Store	Juice Bar	Korean Restaurant	Latin American Restaurant	Light Rail Station	Lingerie Store
37	Toronto Dominion Centre, Design Exchange	Afghan Restaurant	Jazz Club	Jewelry Store	Juice Bar	Korean Restaurant	Lake	Latin American Restaurant	Light Rail Station	Lingerie Store	Liquor Store

Results & Discussion

Based on the tables above, we are able to locate the top 5 neighborhoods with 'Juice Bar' in their top 10 least common venues, namely Central Bay Street, Commerce Court, First Canadian Place, Harbourfront East and Toronto Dominion Center.

The first two neighborhoods have 'Juice Bar' as their 2nd least common venue, while the rest have 'Juice Bar' as their 4th or 6th least common venue. However, we cannot make decision based on the ranking of least common venue alone - we also need to consider the presence of markets / grocery stores that will support the running of juice bar business.

Now we are left with three options - First Canadian Place, Harbourfront East, and Toronto Dominion Center. Since these neighborhoods are pretty similar in terms of their least common venue list, we need to dive further into their venues i.e. we also need to look at their most common venue profiles.

	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
11	First Canadian Place, Underground city	Coffee Shop	Café	Hotel	Gym	Japanese Restaurant	Restaurant	Salad Place	Asian Restaurant	American Restaurant	Steakhouse
14	Harbourfront East, Union Station, Toronto Islands	Coffee Shop	Aquarium	Hotel	Café	Fried Chicken Joint	Scenic Lookout	Restaurant	Italian Restaurant	Brewery	Sporting Goods Shop
37	Toronto Dominion Centre, Design Exchange	Coffee Shop	Café	Hotel	Restaurant	Seafood Restaurant	Japanese Restaurant	Italian Restaurant	American Restaurant	Salad Place	Beer Bar

As we can see from the results, all three neighborhoods have 'Coffee Shop' and 'Cafe' in their top 10 most common venue. However, while First Canadian Place and Toronto Dominion Center have 'Cafe' as their 2nd most common venues, Harbourfront East only has 'Cafe' as its 4th most common venue. On top of that, Harbourfront East also have more tourist attractions such as Aquarium and Scenic Lookout.

Conclusion

In conclusion, based on our analysis, we would suggest the young couple to choose Harbourfront East as their juice bar location. The neighborhood is full of tourist attractions such as aquarium and scenic lookout, and it's not occupied with too many restaurants. It also has lots of hotels and sporting goods shop, which will also support the growth of business.