The Battle of Neighborhood

TAI HUANG

Overview

- Introduction
- Data selection
- Analysis
- Result
- Conclusion

Introduction

This project is to provide a suggestion for:
- ➢The people that want to find a bar for social activity in Toronto.
- ➢Investors who want to invest the Bar business in Toronto.

Data selection

The data used in this analysis is gathered from the following sources.

- **Location information of Neighborhoods in Toronto :**

The location information of Toronto neighborhoods is available from Wikipedia

- **Venue information of interest :**

Venue information of interest is obtained by using the Foursquare API based on the longitude and latitude coordinates of the neighborhood.

Analysis

Scrap the location data from Wikipedia

	PostalCode	Borough	Neighborhood	Latitude	Longitude
0	M5A	Downtown Toronto	Regent Park , Harbourfront	43.654260	-79.360636
1	M7A	Downtown Toronto	Queen's Park , Ontario Provincial Government	43.662301	-79.389494
2	M5B	Downtown Toronto	Garden District, Ryerson	43.657162	-79.378937
3	M5C	Downtown Toronto	St. James Town	43.651494	-79.375418
4	M4E	East Toronto	The Beaches	43.676357	-79.293031
5	M5E	Downtown Toronto	Berczy Park	43.644771	-79.373306
6	M5G	Downtown Toronto	Central Bay Street	43.657952	-79.387383
7	M6G	Downtown Toronto	Christie	43.669542	-79.422564
8	M5H	Downtown Toronto	Richmond , Adelaide , King	43.650571	-79.384568
9	M6H	West Toronto	Dufferin , Dovercourt Village	43.669005	-79.442259
10	M5J	Downtown Toronto	Harbourfront East , Union Station , Toronto Is...	43.640816	-79.381752
11	M6J	West Toronto	Little Portugal , Trinity	43.647927	-79.419750
12	M4K	East Toronto	The Danforth West , Riverdale	43.679557	-79.352188
13	M5K	Downtown Toronto	Toronto Dominion Centre , Design Exchange	43.647177	-79.381576

Analysis

Search the bars in Toronto

	Neighborhood	ID	Rating	Price	Likes	Photos	Tips	Latitude	Longitude
0	SUDS	4cc5e76091413704e955cc55	6.0	2	5	1	3	43.659880	-79.394712
1	Duke's Refresher + Bar	529fa9e111d2159d1f3caa0e	8.1	2	92	217	36	43.658980	-79.382949
2	Duke's Refresher + Bar	529fa9e111d2159d1f3caa0e	8.1	2	92	217	36	43.658980	-79.382949
3	Boxcar Social Temperance	5894c1f9266c1121f0a757d1	8.0	2	35	36	7	43.650557	-79.381956
4	Earls Kitchen & Bar	4d2b615e342d6dcb2b8115cb	7.9	3	262	365	116	43.647946	-79.383706
5	The Greater Good Bar	5753753b498eeb535c53aed5	9.3	2	47	49	6	43.669409	-79.439267
6	Corks Beer & Wine Bar	4d0faed7d467236a7291bf4a	7.5	2	10	19	5	43.642493	-79.381540
7	The Rec Room	5952cf02829b0c59fa430f63	8.1	2	115	103	13	43.641110	-79.386763
8	Reposado	4ae662e8f964a520cfa621e3	8.5	2	86	162	45	43.647321	-79.420032
9	The Communist's Daughter	4adfd8c0f964a520bf7d21e3	8.4	1	68	40	23	43.649362	-79.420963
10	Dakota Tavern	4ad4c05df964a52067f620e3	8.3	1	74	139	33	43.649680	-79.420838
11	apt 200	55fe3af5498edd651ce3c385	8.3	2	41	5	6	43.644026	-79.420063
12	Bar Fancy	545d6eeb498ea42297425c1e	8.2	2	68	31	16	43.643734	-79.421326
13	Boxcar Social Temperance	5894c1f9266c1121f0a757d1	8.0	2	35	36	7	43.650557	-79.381956
14	Pharmacy	50dfbed9e4b01ebc5ced2ae3	8.8	2	44	51	5	43.638090	-79.431810
15	Boxcar Social Temperance	5894c1f9266c1121f0a757d1	8.0	2	35	36	7	43.650557	-79.381956
16	Earls Kitchen & Bar	4d2b615e342d6dcb2b8115cb	7.9	3	262	365	116	43.647946	-79.383706
17	The Roy Public House	4ad79986f964a5209d0c21e3	6.7	2	42	79	35	43.660452	-79.342994
18	Hole in the Wall	4baebdabf964a520ddd33be3	8.9	2	85	82	35	43.665296	-79.465118
19	Shoxs	4b26d1aff964a520698124e3	5.7	2	5	11	11	43.665353	-79.463563
20	The Local Pub and Restaurant	4ad4c05df964a52068f620e3	7.4	2	41	63	37	43.651017	-79.450911
21	Harbord House	4ade455bf964a520837421e3	8.8	2	52	79	29	43.662466	-79.405410
22	Charlie's Gallery	4af11491f964a520aee021e3	6.2	2	5	3	3	43.662810	-79.403822
23	A Dark Horse	4af6185af964a5201c0122e3	6.0	2	19	19	16	43.649533	-79.483056
24	Cold Tea	4e9a55b68231878c156f04bf	8.5	1	162	140	48	43.654193	-79.401075
25	Trinity Common	55175269498ef06e96eeeb98	8.0	2	84	113	13	43.656590	-79.402761
26	The Supermarket	4ad4c05df964a5206af620e3	5.8	2	40	118	31	43.656680	-79.402954
27	Earls Kitchen & Bar	4d2b615e342d6dcb2b8115cb	7.9	3	262	365	116	43.647946	-79.383706
28	Boxcar Social Temperance	5894c1f9266c1121f0a757d1	8.0	2	35	36	7	43.650557	-79.381956
29	Loose Moose	4ae603a5f964a52010a421e3	7.8	2	272	515	109	43.645281	-79.383966

Analysis

Find the relationships among Likes, Photos, Price, Tips and Rating of Bar

	Rating	Price	Likes	Photos	Tips
Rating	1.000000	-0.118195	0.284868	0.171478	0.106293
Price	-0.118195	1.000000	0.454389	0.452030	0.522452
Likes	0.284868	0.454389	1.000000	0.934885	0.940157
Photos	0.171478	0.452030	0.934885	1.000000	0.932678
Tips	0.106293	0.522452	0.940157	0.932678	1.000000

Analysis

Explore the neighborhoods of different bars

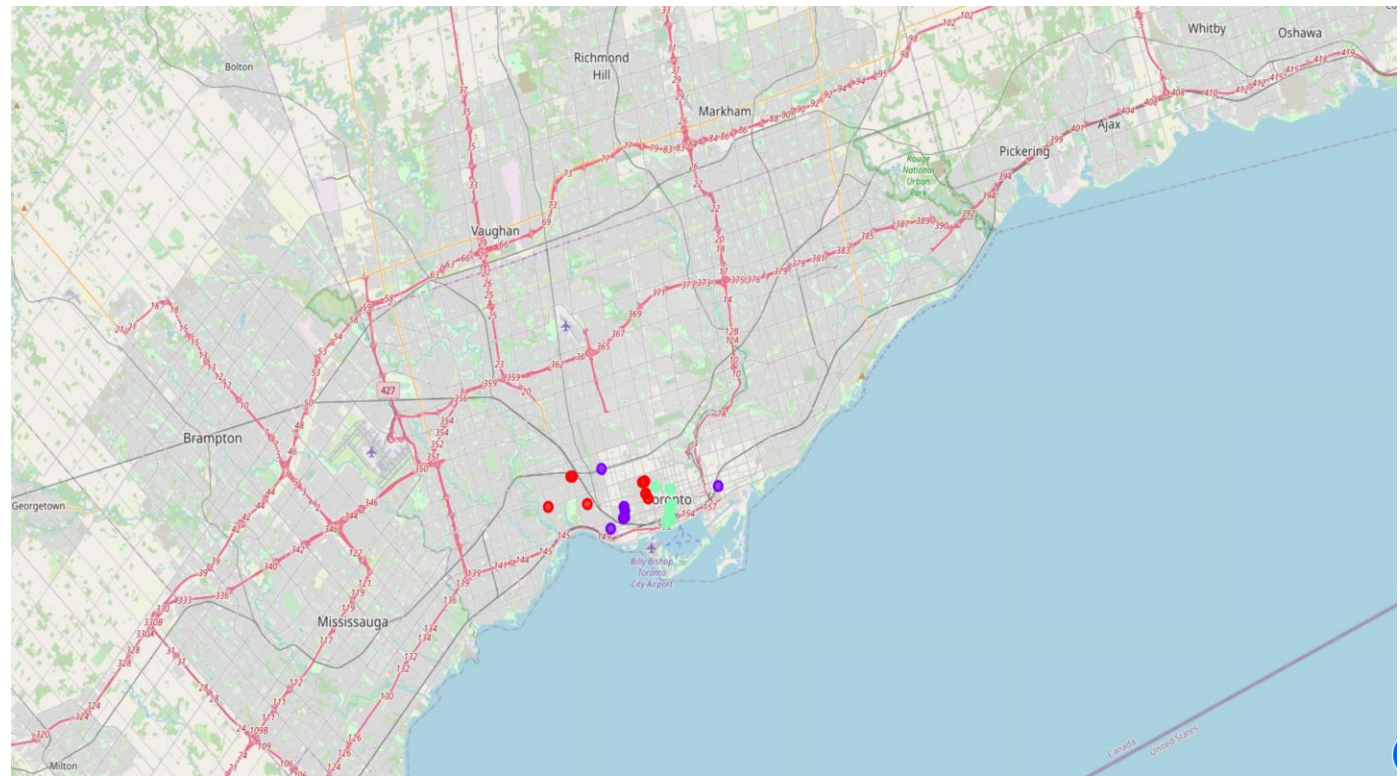|	Neighborhood	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue ID	Venue Latitude	Venue Longitude	Venue Category
0	SUDS	43.659880	-79.394712	Prenup Pub	54238a83498e5efd4a50435b	43.658882	-79.394828	Gastropub
1	SUDS	43.659880	-79.394712	Starbucks	576d30ed498ef2e95e26e6d0	43.659456	-79.390411	Coffee Shop
2	SUDS	43.659880	-79.394712	Kekou Gelato House	51e87a62498e8eea21f772d3	43.656099	-79.392715	Ice Cream Shop
3	SUDS	43.659880	-79.394712	McCafé	5b57b67fc53093003750b093	43.657943	-79.398993	Café
4	SUDS	43.659880	-79.394712	Vegetarian Haven	4aeb711ef964a52017c221e3	43.656016	-79.392758	Vegetarian / Vegan Restaurant
5	SUDS	43.659880	-79.394712	Queen's Park	4b9d206bf964a520e69136e3	43.663946	-79.392180	Park
6	SUDS	43.659880	-79.394712	Jimmy's Coffee	57fe5f64498e08c9fc55cb87	43.655827	-79.392042	Café
7	SUDS	43.659880	-79.394712	Hart House Theatre	4ce47a4bc850721e2b8bc38a	43.663571	-79.394616	Theater
8	SUDS	43.659880	-79.394712	Fat Bastard Burrito	55e1f58b498ed51280251aa4	43.658900	-79.394530	Burrito Place
9	SUDS	43.659880	-79.394712	The Clubhouse	51b8ebe8e4b051460c6dfa24	43.658246	-79.399894	Sandwich Place
10	SUDS	43.659880	-79.394712	Koh Lipe	5cb0d23175dcb7002cb5e3ad	43.655933	-79.393480	Thai Restaurant
11	SUDS	43.659880	-79.394712	A & C World	4dbc33b90cb691071c9c7d29	43.657409	-79.399847	Gaming Cafe
12	SUDS	43.659880	-79.394712	Sambuca Grill	4b758acdf964a520e0122ee3	43.656110	-79.392946	Italian Restaurant
13	SUDS	43.659880	-79.394712	Toronto Vegetarian Association	4b117fa4f964a520df7d23e3	43.655953	-79.392854	Office
14	SUDS	43.659880	-79.394712	Charidise	588541549343e011e4a22fbb	43.655985	-79.393233	Bubble Tea Shop
15	SUDS	43.659880	-79.394712	Mother's Dumplings	4b7716a9f964a520297c2ee3	43.657105	-79.399552	Dumpling Restaurant
16	SUDS	43.659880	-79.394712	Second Cup	4b72de05f964a520668c2de3	43.659018	-79.394152	Coffee Shop
17	SUDS	43.659880	-79.394712	Booster Juice	4baa6c4af964a520bb683ae3	43.658016	-79.399300	Juice Bar
18	SUDS	43.659880	-79.394712	Flock Rotisserie + Greens	59ea2931f96b2c78d41cc639	43.659167	-79.389475	Fried Chicken Joint
19	SUDS	43.659880	-79.394712	Subway	4bce296fcc8cd13aeddfc3cf	43.658683	-79.394896	Sandwich Place
20	SUDS	43.659880	-79.394712	Midi Bistro	4ba8f061f964a520e8fb39e3	43.655871	-79.392091	French Restaurant

Analysis

Cluster the bars in Toronto

	Neighborhood	ID	Rating	Price	Likes	Photos	Tips	Latitude	Longitude	Cluster Labels
0	SUDS	4cc5e76091413704e955cc55	6.0	2	5	1	3	43.659880	-79.394712	2
1	Duke's Refresher + Bar	529fa9e111d2159d1f3caa0e	8.1	2	92	217	36	43.658980	-79.382949	2
2	Duke's Refresher + Bar	529fa9e111d2159d1f3caa0e	8.1	2	92	217	36	43.658980	-79.382949	2
3	Boxcar Social Temperance	5894c1f9266c1121f0a757d1	8.0	2	35	36	7	43.650557	-79.381956	2
4	Earls Kitchen & Bar	4d2b615e342d6dcb2b8115cb	7.9	3	262	365	116	43.647946	-79.383706	2
5	The Greater Good Bar	5753753b498eeb535c53aed5	9.3	2	47	49	6	43.669409	-79.439267	1
6	Corks Beer & Wine Bar	4d0faed7d467236a7291bf4a	7.5	2	10	19	5	43.642493	-79.381540	2
7	The Rec Room	5952cf02829b0c59fa430f63	8.1	2	115	103	13	43.641110	-79.386763	2
8	Reposado	4ae662e8f964a520cfa621e3	8.5	2	86	162	45	43.647321	-79.420032	1
9	The Communist's Daughter	4adfd8c0f964a520bf7d21e3	8.4	1	68	40	23	43.649362	-79.420963	1
10	Dakota Tavern	4ad4c05df964a52067f620e3	8.3	1	74	139	33	43.649680	-79.420838	1
11	apt 200	55fe3af5498edd651ce3c385	8.3	2	41	5	6	43.644026	-79.420063	1
12	Bar Fancy	545d6eeb498ea42297425c1e	8.2	2	68	31	16	43.643734	-79.421326	1
13	Boxcar Social Temperance	5894c1f9266c1121f0a757d1	8.0	2	35	36	7	43.650557	-79.381956	2
14	Pharmacy	50dfbed9e4b01ebc5ced2ae3	8.8	2	44	51	5	43.638090	-79.431810	1
15	Boxcar Social Temperance	5894c1f9266c1121f0a757d1	8.0	2	35	36	7	43.650557	-79.381956	2
16	Earls Kitchen & Bar	4d2b615e342d6dcb2b8115cb	7.9	3	262	365	116	43.647946	-79.383706	2
17	The Roy Public House	4ad79986f964a5209d0c21e3	6.7	2	42	79	35	43.660452	-79.342994	1
18	Hole in the Wall	4baebdabf964a520ddd33be3	8.9	2	85	82	35	43.665296	-79.465118	0
19	Shoxs	4b26d1aff964a520698124e3	5.7	2	5	11	11	43.665353	-79.463563	0
20	The Local Pub and Restaurant	4ad4c05df964a52068f620e3	7.4	2	41	63	37	43.651017	-79.450911	0
21	Harbord House	4ade455bf964a520837421e3	8.8	2	52	79	29	43.662466	-79.405410	0
22	Charlie's Gallery	4af11491f964a520aee021e3	6.2	2	5	3	3	43.662810	-79.403822	0
23	A Dark Horse	4af6185af964a5201c0122e3	6.0	2	19	19	16	43.649533	-79.483056	0
24	Cold Tea	4e9a55b68231878c156f04bf	8.5	1	162	140	48	43.654193	-79.401075	0
25	Trinity Common	55175269498ef06e96eeeb98	8.0	2	84	113	13	43.656590	-79.402761	0
26	The Supermarket	4ad4c05df964a5206af620e3	5.8	2	40	118	31	43.656680	-79.402954	0
27	Earls Kitchen & Bar	4d2b615e342d6dcb2b8115cb	7.9	3	262	365	116	43.647946	-79.383706	2
28	Boxcar Social Temperance	5894c1f9266c1121f0a757d1	8.0	2	35	36	7	43.650557	-79.381956	2
29	Loose Moose	4ae603a5f964a52010a421e3	7.8	2	272	515	109	43.645281	-79.383966	2

Analysis

Cluster the bars in Toronto

Results

✓ Based on the ANOVA analysis, there is significant difference on the performance between bars of different cluster

✓ The bars of cluster 1 have the best performance. The deeper investigation will be on them.

Cluster Labels
0   7.255556
1   8.312500
2   7.792308
Name: Rating, dtype: float64

Multiple Comparison of Means - Tukey HSD,FWER=0.05
==
group1 group2 meandiff lower upper reject
----
0   1   1.0569 -0.0328 2.1467 False
0   2   0.5368 -0.4358 1.5093 False
1   2   -0.5202 -1.528 0.4876 False

Results

✓ The neighborhood of Cluster 1 bars has its special characteristics

	Cluster 1
Venue Category	
Bar	3.875
Restaurant	2.500
Café	2.125
Coffee Shop	2.000
Vegetarian / Vegan Restaurant	1.250
Asian Restaurant	1.125
Ice Cream Shop	1.125
Brewery	1.125
Italian Restaurant	1.125
Cocktail Bar	1.000
Japanese Restaurant	1.000
Sandwich Place	1.000
Men's Store	1.000

Conclusion

1. As a result, for those who want to find a bar, they should consider locations with high density of bars and close to other restaurants or relaxing places serving light meals.

2. For those aiming to invest a bar, they should find places which have relaxing and free atmosphere.

Discussion & Future work

☐ location selection is only one fundamental problem to think over. It can't solve the problem of whether the type of a bar is popular or not.

☐ This project doesn't consider how many customers will visit every day

☐ This project offers an opportunity analysis but lacks risk analysis

☐ More practical and profitable ideas need to be considered. The relationship between financial performance of bar and customers' reactions is valuable to be analyzed.

Thank you for your attention.