The Battle of Neighbourhoods

1. Introduction and Business Problem

An investor is keen on setting up a modern mid-priced Chinese restaurant within the downtown area in Toronto, and would like to know which neighbourhood is most suitable.

The target customers of this planned restaurant are the people who work in the area (which will form the primary target segment for weekday lunch and to some extent weekday dinners), and people who live within the vicinity (which will be the target segment for weekends and weekday dinners).

However, the investor is most concerned about competition, both in terms of the choice of Chinese restaurants in the vicinity, and also the quality of those restaurants. Additionally, as the restaurant will be opened throughout the day (from 11:30am till 9:30pm), the neighbourhood should ideally have a reasonable number and good mix of venues and establishments that will ensure that there are potential customers all day.

2. Data

In order to narrow down the list of neighbourhoods to set up the Chinese restaurant, we need to understand the venues and establishments within the vicinity. Hence, we can use Foursquare location data for this purpose.

Specifically, we can use Foursquare API to: (a) find the top venues in each neighbourhood to determine their mix and characteristics as well as the presence of Chinese restaurants; and (b) perform search queries to get the overall rating for specific Chinese restaurants to determine competition strength.

Through the extraction and analysis of Foursquare data, we hope to be able to recommend a neighbourhood most suitable for the investor to set up the Chinese restaurant based on the criteria set.

This analysis can be supplemented by on-site visits to the neighbourhood to locate potential premises to rent as well as further in-depth due diligence, which will be outside of scope of this exercise.

3. Methodology

Loading the Toronto location data, and selecting the Downtown Toronto borough as a subset, we find a total of 18 postcodes/neighbourhoods which are well spread across the borough.

	Postcode	Borough	Neighborhood	Latitude	Longitude
0	M5A	Downtown Toronto	Harbourfront, Regent Park	43.654260	-79.360636
1	M5B	Downtown Toronto	Ryerson, Garden District	43.657162	-79.378937
2	M5C	Downtown Toronto	St. James Town	43.651494	-79.375418
3	M5E	Downtown Toronto	Berczy Park	43.644771	-79.373306
4	M5G	Downtown Toronto	Central Bay Street	43.657952	-79.387383
5	M6G	Downtown Toronto	Christie	43.669542	-79.422564
6	M5H	Downtown Toronto	Adelaide, King, Richmond	43.650571	-79.384568
7	M5J	Downtown Toronto	Harbourfront East, Toronto Islands, Union Station	43.640816	-79.381752
8	M5K	Downtown Toronto	Design Exchange, Toronto Dominion Centre	43.647177	-79.381576
9	M5L	Downtown Toronto	Commerce Court, Victoria Hotel	43.648198	-79.379817
10	M5S	Downtown Toronto	Harbord, University of Toronto	43.662696	-79.400049
11	M5T	Downtown Toronto	Chinatown, Grange Park, Kensington Market	43.653206	-79.400049
12	M5V	Downtown Toronto	CN Tower, Bathurst Quay, Island airport, Harbo...	43.628947	-79.394420
13	M4W	Downtown Toronto	Rosedale	43.679563	-79.377529
14	M5W	Downtown Toronto	Stn A PO Boxes 25 The Esplanade	43.646435	-79.374846
15	M4X	Downtown Toronto	Cabbagetown, St. James Town	43.667967	-79.367675
16	M5X	Downtown Toronto	First Canadian Place, Underground city	43.648429	-79.382280
17	M4Y	Downtown Toronto	Church and Wellesley	43.665860	-79.383160

From this subset of data, we then used the FourSquare API to retrieve the top 100 venues within a 1km radius in each neighbourhood of the Downtown Toronto borough.

We then proceeded to eliminate neighbourhoods based on the following criteria:

- Less than 100 venues retrieved – This suggests the neighbourhoods may be too quiet with insufficient traffic as potential customer base for the restaurant.
- Presence of Chinese restaurants – This addresses the competition concern of the investor. With only several neighbourhoods having a Chinese restaurant, we can exclude them.
- Presence of hotels – Neighbourhoods with higher number of hotels were preferred as they would be a good customer base for both lunches and dinners, so we dropped those which had fewer hotels. Hotels are a proxy for people who live in the area. As this is

Downtown Toronto, it is also less likely that the area has a high concentration of residential housing.

After applying the above filters, we narrowed the list to 3 remaining neighbourhoods. From here, we explored the mix of the top 100 venues within each neighbourhood to determine the diversity of activities, paying attention to venue categories that could boost customer traffic.

From this analysis, we recommended one neighbourhood, and further performed cluster analysis to determine if there was any particular location within the neighbourhood that may stand out in terms of density of venues.

4. Results

From the first set of filters, we progressively dropped neighbourhoods from the initial long list of 18 postcodes/neighbourhoods based on the top 100 venues retrieved using FourSquare API.

- 3 of the 18 neighbourhoods had fewer than 100 venues retrieved.

Neighborhood	Neighborhood Latitude	Neighborhood Longitude	Venue
Adelaide, King, Richmond	100	100	100
Berczy Park	100	100	100
CN Tower, Bathurst Quay, Island airport, Harbourfront West, King and Spadina, Railway Lands, South Niagara	16	16	16
Cabbagetown, St. James Town	42	42	42
Central Bay Street	100	100	100
Chinatown, Grange Park, Kensington Market	100	100	100
Christie	100	100	100
Church and Wellesley	100	100	100
Commerce Court, Victoria Hotel	100	100	100
Design Exchange, Toronto Dominion Centre	100	100	100
First Canadian Place, Underground city	100	100	100
Harbord, University of Toronto	100	100	100
Harbourfront East, Toronto Islands, Union Station	100	100	100
Harbourfront, Regent Park	100	100	100
Rosedale	22	22	22
Ryerson, Garden District	100	100	100
St. James Town	100	100	100
Stn A PO Boxes 25 The Esplanade	100	100	100

- 6 of remaining 15 neighbourhoods had at least one Chinese restaurant.

Neighborhood	Neighborhood Latitude	Neighborhood Longitude	Venue
Central Bay Street	2	2	2
Chinatown, Grange Park, Kensington Market	3	3	3
Christie	1	1	1
Church and Wellesley	1	1	1
Harbourfront East, Toronto Islands, Union Station	1	1	1
Ryerson, Garden District	1	1	1

- 2 of remaining 9 neighbourhoods did not have a hotel, while 3 neighbourhoods had 8 or more hotels.

Neighborhood	Neighborhood Latitude	Neighborhood Longitude	Venue
Adelaide, King, Richmond	3	5	5
Berczy Park	6	6	6
Commerce Court, Victoria Hotel	8	8	8
Design Exchange, Toronto Dominion Centre	10	10	10
First Canadian Place, Underground city	8	8	8
St. James Town	5	5	5
Stn A PO Boxes 25 The Esplanade	5	5	5

After this stage, the 3 remaining neighbourhoods for consideration were: (a) Commerce Court, Victoria Hotel; (b) Design Exchange, Toronto Dominion Centre; and (c) First Canadian Place, Underground city

Exploring the mix within the top 100 venues in each of these 3 neighbourhoods, we found no distinct differences in activity/venue diversity among them that could substantially boost customer traffic.

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----Commerce Court, Victoria Hotel----      ---Design Exchange, Toronto Dominion Centre---      ----First Canadian Place, Underground city----
              venue  freq                                   venue  freq                                        venue  freq
0             Hotel  0.08                      0            Hotel  0.10                           0            Hotel  0.08
1       Coffee Shop  0.08                      1             Café  0.08                           1             Café  0.07
2              Café  0.06                      2      Coffee Shop  0.06                           2      Coffee Shop  0.07
3        Restaurant  0.05                      3       Steakhouse  0.04                           3       Steakhouse  0.04
4  Italian Restaurant 0.04                     4 Italian Restaurant 0.04                          4       Restaurant  0.04
5          Gastropub  0.04                     5        Restaurant 0.03                           5 American Restaurant 0.04
6         Steakhouse  0.03                     6      Concert Hall 0.03                           6 Italian Restaurant 0.04
7 American Restaurant 0.03                     7 American Restaurant 0.03                          7       Deli / Bodega 0.03
8       Deli / Bodega 0.03                     8      Deli / Bodega 0.03                          8           Theater  0.03
9        Concert Hall 0.03                     9        Sports Bar 0.02                           9 Japanese Restaurant 0.02
10       Cocktail Bar 0.02                     10            Plaza 0.02                           10      Concert Hall 0.02
11       Thai Restaurant 0.02                  11             Park 0.02                           11              Bar  0.02
12  Japanese Restaurant 0.02                   12 Monument / Landmark 0.02                         12              Gym  0.02
13              Gym  0.02                       13 Japanese Restaurant 0.02                         13        Gastropub  0.02
14      Farmers Market  0.02                    14              Gym  0.02                          14           Bakery  0.02
15          Theater  0.02                       15   Thai Restaurant 0.02                          15   Thai Restaurant 0.02
16           Bakery  0.02                       16        Gastropub 0.02                           16  Sushi Restaurant 0.02
17              Bar  0.02                        17           Lounge 0.02                           17        Sports Bar 0.01
18              Pub  0.01                        18          Theater 0.02                           18       Noodle House 0.01
19           Lounge  0.01                       19           Bakery 0.02                           19           Lounge  0.01
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Hence, we recommend "Design Exchange, Toronto Dominion Centre" neighbourhood as it has the highest concentration of hotels – a key source of customer traffic for the restaurant.

5. Discussion

Our step-by-step elimination process based on an interpretation of the investor's criteria reduced the initial 18 neighbourhoods to a final 3 shortlisted neighbourhoods. Among these 3 remaining neighbourhoods, there was no distinct difference in terms of venue mix.

A summary of the key venue categories is shown below.

- Commerce Court, Victoria Hotel -- Hotel (8), Concert Hall (3), Gym(2), Farmer's Market (2), Theatre (2)
- Design Exchange, Toronto Dominion Centre -- Hotel (10), Concert Hall (3), Park (2), Gym (2), Theatre (2)
- First Canadian Place, Underground city -- Hotel (8), Theatre (3), Concert Hall (2), Gym (2)

If we were limited to just one neighbourhood, our neighbourhood pick would be "Design Exchange, Toronto Dominion Centre", which had the highest number of hotels.

We further applied cluster analysis based on the top 100 venues within this neighbourhood, but did not find clear distinction between clusters. Hence, we recommend an on-site visit to scout for suitable premises for the restaurant.
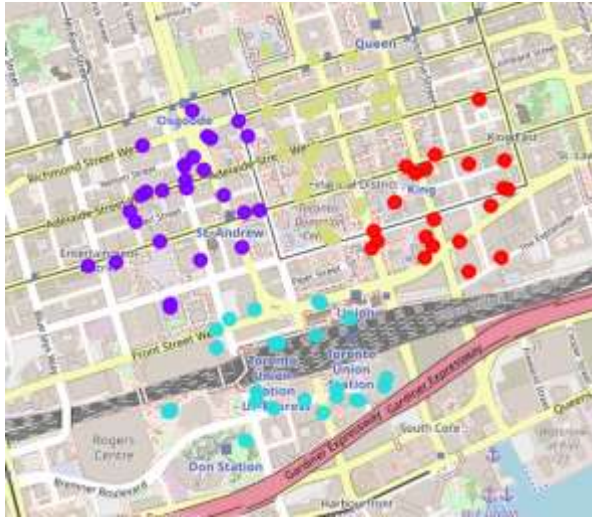
6. Conclusion

Starting from 18 neighbourhoods in Downtown Toronto borough, we methodically narrowed the list down to a final 3 neighbourhoods using the investor's requirements and concerns as a guide. Eventually, the recommended choice of "Design Exchange, Toronto Dominion Centre" came down to the higher concentration of hotels in this neighbourhood compared to the others.

Cluster analysis did not reveal any discerning patterns within the selected neighbourhood, so an on-site visit to identify potential premises for the restaurant is the next suggested step, along with further due diligence work.