Neighborhoods Comparison

- The Battle of Neighborhoods –

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1. Introduction

Toronto and Vancouver are well-known cities in Canada. Recently, Canada announced the immigration policy, and according to the new immigration policy, Canada will accept more immigrants. Many people who are thinking of immigration to Canada, ask "Which city is better, Toronto or Vancouver?" Of course, the answer will depend on the conditions, and they have their criteria to make a decision. Although the answer or decision is subjective, if they have information about the cities, it will help them make a decision.

1.1 Where to Live

For the new immigrants, where to live is one of the most important issues. If the immigrants have children, they might prefer the location near the school. Some immigrants happy if many amenities are within walking distance. Although google map or other map gives us much information, it is not easy to examine the whole city. Instead, neighbourhood data of schools, restaurants, and marts are more convenient and useful.

1.2 Best Place for New Business

If a new immigrant wants to open a Thai restaurant, he might think of the best location for the Thai restaurant. Although the criteria for the best places are different, they want to know competitors and potential customers. They may choose Vancouver because many Thai restaurants are in Toronto but very rare in Vancouver.

2. Datasets

2.1 Toronto Neighborhoods

Toronto, the provincial capital of Ontario, is the largest city in Canada with a population about of 2.7 million people and the most populous city in Canada. Toronto is also the most preferred city for the new immigrants in Canada. Toronto has about 200 neighborhoods.

2.2 Metro Vancouver Neighborhoods

Metro Vancouver is consisted of 23 cities and villages. Metro Vancouver is the second preferred city for the new immigrants to Canada and the population is about 2.4 million. In this comparison of neighborhood between Toronto and Metro Vancouver, neighborhoods in 7 cities of the Metro Vancouver are included. The 7 cities are Vancouver, West Vancouver, North Vancouver, Burnaby, Surrey, Coquitlam, and Richmond.

2.3 Source of the data

List of Neighborhoods of Toronto and city of Vancouver is from Wikipedia.

- Toronto Neighborhoods
  (https://en.wikipedia.org/wiki/List_of_postal_codes_of_Canada:_M)
- City of Vancouver
  (https://en.wikipedia.org/wiki/List_of_neighbourhoods_in_Vancouver)
- Additional 6 cities of Metro Vancouver: West Vancouver, North Vancouver, Burnaby, Surrey, Coquitlam, and Richmond
  Wikipedia did not have neighborhoods list for those 6 cities and the list of neighborhoods was gathered from various Internet site including home pages of the cities. The list of neighborhoods from various sources saved in CSV file.

2.4 Coordinates of the Neighborhoods

"geocode" function of "geopy" is used to get the coordinates of the neighborhoods. However, "geopy" does not have latitude and longitude for some neighborhoods.

2.5 Venue Information

Foursquare returns venue information with its location (latitude and longitude) and category of venue. The list of venue category can be found on https://developer.foursquare.com/docs/build-with-foursquare/categories/. How to categorize the venue is outside of this comparison, however, for business purpose, cleaning of categorize should be carried.

In this comparison, the number of venues for each neighborhood are limited to 100 within 1,000 m from the given location. Some venues are overlapped in more than two neighborhoods.

Below table shows venue information of Parkwoods neighborhood in Toronto. 29 venues are located within 1,000m radius.

Venue	Venue Latitude	Venue Longitude	Venue Category
Allwyn's Bakery	43.75984035203160	-79.32471879917510	Caribbean Restaurant
Tim Hortons	43.76066827030230	-79.32636763515990	Café
LCBO	43.75777384662440	-79.31425673330510	Liquor Store
A&W	43.760643076161300	-79.3268649067081	Fast Food Restaurant
Dollarama	43.758135	-79.310672	Discount Store
Shoppers Drug Mart	43.76085733239680	-79.32496051573520	Pharmacy
Tim Hortons	43.75829469411580	-79.31230985443110	Coffee Shop
The Beer Store	43.7582748	-79.3137052	Beer Store
Food Basics	43.76054899113780	-79.32604520023010	Supermarket

Staples	43.7583791	-79.3106954	Paper / Office Supplies Store
Subway	43.758072972398800	-79.31223512364830	Sandwich Place
Tim Hortons	43.75281395751710	-79.3140672147274	Coffee Shop
Pizza Pizza	43.76023098701760	-79.32566642761230	Pizza Place
China Cottage	43.759097495523400	-79.3104188485618	Hakka Restaurant
TD Canada Trust	43.7574396	-79.3148385	Bank
Petro-Canada	43.75795	-79.315187	Gas Station
Second Cup	43.757482276690600	-79.31169510099220	Coffee Shop
Shoppers Drug Mart	43.75744	-79.312548	Pharmacy
Petro-Canada	43.763238	-79.318133	Gas Station
Wild Wing	43.75619568821280	-79.31451382469170	Wings Joint
Sushi Ichiban	43.758911588132400	-79.31081062930810	Sushi Restaurant
Metro	43.75664255813590	-79.31363940238950	Supermarket
Parkwoods Coin Laundry	43.76038596280910	-79.32489395141600	Laundry Service
McDonald's	43.758048297820500	-79.31324248492710	Fast Food Restaurant
Parkway Bowl	43.757699012868100	-79.31145039762850	Bowling Alley
Wimpy's Diner	43.759334850907900	-79.3098316408897	Breakfast Spot
Vogue Nails	43.7581567213508	-79.31038547764350	Spa
Pharmacy Ave & Ellesmere Rd	43.75913098830880	-79.31012879382850	Intersection
Domino's Pizza	43.75942567220300	-79.30989349437850	Pizza Place

Table 1 Venue information of Parkwoods neighborhood in Toronto

3. Data Analysis and Exploration

3.1 Number of Venues and Categories

Toronto has 359 categories of venues while Metro Vancouver has 294 categories. More than 10,000 venues are found in Toronto, and Metro Vancouver has about 4,000 venues.

toronto_venue_category.csv and Vancouver_venue_category.csv have list of venues in order of occurrence. Toronto has more diversity in venue types than Metro Vancouver and more venues are there.

3.2 The Most Common Venues

Coffee shop is the most common venue in both Toronto and Metro Vancouver. Looking at the top 10 common venues in Toronto and Metro Vancouver, you will find that Asian restaurants such as Japanese restaurant, Chinese restaurant and Sushi restaurant are high ranked in Metro Vancouver. It might be related with location of the city and the country of origin of the immigrants.

Rank	Toronto		Metro Vancouver	
	Category	Number of Venues	Category	Number of Venues
1	Coffee Shop	781	Coffee Shop	282
2	Cafe	420	Park	170
3	Park	317	Sushi Restaurant	139
4	Restaurant	306	Grocery Store	115
5	Pizza Place	277	Cafe	110
6	Italian Restaurant	254	Chinese Restaurant	107
7	Bakery	229	Sandwich Place	103
8	Sandwich Place	221	Japanese Restaurant	103
9	Grocery Store	207	Fast Food Restaurant	92
10	Sushi Restaurant	183	Bank	86

Table 2 Top 10 Common Venues in Toronto and Metro Vancouver

Top 10 venues of the neighborhood will be helpful to those who have plan to open their own business such as restaurant. Number of competitors and locations of the competitors are easily confirmed by the list. In this comparison, top 10 common venues are used for comparison and it could be expanded to 15 or 20 venues. If a specific type of venue is given, it can display the location or number of venues in the city. For example, Thai restaurant is more popular in Toronto than Metro Vancouver. Because Thai restaurant ranked 10th in Adelaide neighborhood of Toronto, however, in Metro Vancouver, Thai restaurant is very rare.

Example of neighborhood and its top 10 venues are shown in the Table 3 and 4.

Neighborhood	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
Parkwoods	Coffee Shop	Supermarket	Gas Station	Fast Food Restaurant	Pharmacy	Pizza Place	Café	Paper / Office Supplies Store	Sushi Restaurant	Bowling Alley
Victoria Village	Middle Eastern Restaurant	Portuguese Restaurant	Thai Restaurant	Thrift / Vintage Store	Chinese Restaurant	Park	Asian Restaurant	Mediterranean Restaurant	Pet Store	Pizza Place
Regent Park	Coffee Shop	Restaurant	Café	Bakery	Park	Thai Restaurant	Fast Food Restaurant	Breakfast Spot	Diner	Pub
Harbourfront	Coffee Shop	Hotel	Café	Park	Brewery	Gym	Japanese Restaurant	Scenic Lookout	Art Gallery	Baseball Stadium
Lawrence Manor	Coffee Shop	Bagel Shop	Pizza Place	Middle Eastern Restaurant	Fast Food Restaurant	Department Store	Metro Station	Pet Store	Sandwich Place	Liquor Store
Lawrence Heights	Clothing Store	Restaurant	Coffee Shop	Fast Food Restaurant	Furniture / Home Store	Dessert Shop	Food Court	Toy / Game Store	Grocery Store	Greek Restaurant
Queen's Park	Coffee Shop	Café	Park	Sushi Restaurant	Japanese Restaurant	Ramen Restaurant	Mexican Restaurant	Bubble Tea Shop	Theater	Italian Restaurant
Islington Avenue	Coffee Shop	Bakery	Sandwich Place	Grocery Store	Pizza Place	Restaurant	Fast Food Restaurant	Pub	Gym / Fitness Center	Thrift / Vintage Store
Humber Valley Village	Park	Pharmacy	Grocery Store	Bank	Shopping Mall	Supermarket	Liquor Store	Skating Rink	Camera Store	Café
Malvern	Fast Food Restaurant	Park	Grocery Store	Pharmacy	Pizza Place	Gym / Fitness Center	Sandwich Place	Salon / Barbershop	Bubble Tea Shop	Supermarket

Table 3 Example of Neighborhood and its top 10 common venues in Toronto

Neighborhood	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
Arbutus Ridge	Liquor Store	Pet Store	Gym	Caribbean Restaurant	Bakery	Food Truck	Seafood Restaurant	Event Space	Sandwich Place	Park
Downtown	Hotel	Park	Food Truck	Clothing Store	Japanese Restaurant	Dessert Shop	Ramen Restaurant	Café	Sandwich Place	Restaurant
Dunbar	Sushi Restaurant	Bank	Liquor Store	Coffee Shop	Pizza Place	Sandwich Place	Restaurant	Indian Restaurant	Cosmetics Shop	Pub
Fairview	Coffee Shop	Furniture / Home Store	Japanese Restaurant	Park	Breakfast Spot	Restaurant	Café	Bakery	American Restaurant	Camera Store
Grandview	Coffee Shop	Pizza Place	Sushi Restaurant	Park	Sandwich Place	Chinese Restaurant	Ice Cream Shop	Vietnamese Restaurant	Breakfast Spot	Vegetarian / Vegan Restaurant
Hastings	Park	Coffee Shop	Theme Park Ride / Attraction	Vietnamese Restaurant	Event Space	Fast Food Restaurant	Gas Station	Theme Park	Convenience Store	Pharmacy
Kensington	Liquor Store	Pharmacy	Shopping Plaza	Grocery Store	Ski Area	Trail	Café	Bank	Cosmetics Shop	Ice Cream Shop
Kerrisdale	Bus Stop	Golf Course	Grocery Store	Pool	Supermarket	Café	Spanish Restaurant	Park	Gift Shop	Zoo Exhibit
Killarney	Grocery Store	Pharmacy	Track	Chinese Restaurant	Park	Gas Station	Sushi Restaurant	Coffee Shop	Juice Bar	Bus Stop
Kitsilano	Coffee Shop	Bakery	Yoga Studio	Café	Pizza Place	Japanese Restaurant	French Restaurant	Board Shop	Restaurant	Vegetarian / Vegan Restaurant

Table 4 Example of Neighborhood and its top 10 common venues in Toronto

4. Neighborhoods Clustering

Using K-means clustering method, the neighborhoods are categorized into 5 clusters. The dataset used for clustering is consisted of neighborhood and its top 10 common venues.

Cluster		Number of Neighborhoods		Avg. Number of Venues per Neighborhood	
Label	Color	Toronto	Metro Vancouver	Toronto	Metro Vancouver
0	Gray	31	42	50.00	50.48
1	Orange	20	3	99.75	100.00
2	Lime	43	9	80.06	91.67
3	Magenta	85	68	19.81	13.13
4	Cyan	16	0	100.00	

Table 5 Number of Neighborhoods for each Cluster

Cluster 0 has 73 neighborhoods and 50 venues on average in the cluster. This cluster could be classified as semi-commercial and residential area.

Cluster 1 is located in the downtown area and 23 neighborhoods are in this cluster. Hotels and concert halls are highly ranked. This cluster could be classified as a city center.

Cluster 2 is located near the city center and 52 neighborhoods are in the cluster. The neighborhoods in cluster 2 have bout 80 to 90 venues on average. This cluster could be classified as a commercial area.

Cluster 3 has 153 neighborhoods, and each neighborhood has about 13 to 20 venues on average. This cluster could be classified as a residential area.

Cluster 4 is founded only in Toronto and 16 neighborhoods are in this cluster. The average number of venues per neighborhood is 100. The neighborhoods in the cluster located near the city center thus could be classified as a downtown area.
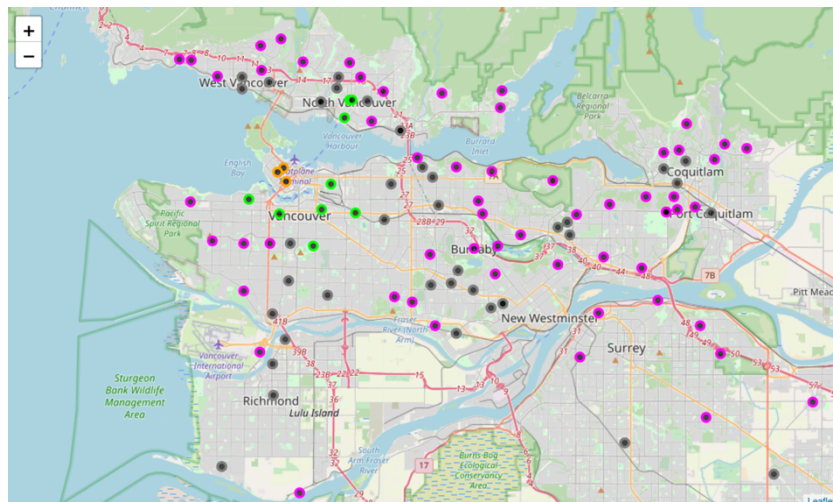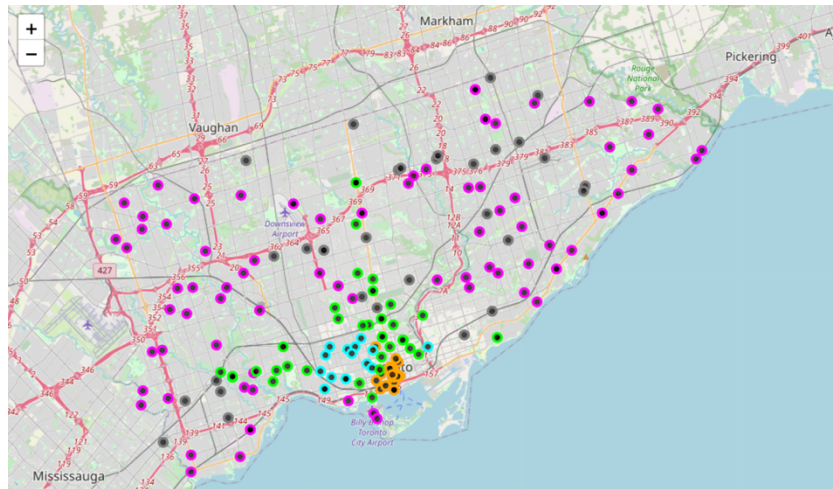
Figure 1 Distribution of Clusters: Toronto (Above) and Metro Vancouver (Below)

Neighborhood	City	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
Lawrence Manor	Toronto	Coffee Shop	Bagel Shop	Pizza Place	Middle Eastern Restaurant	Fast Food Restaurant	Department Store	Metro Station	Pet Store	Sandwich Place	Liquor Store
Lawrence Heights	Toronto	Clothing Store	Restaurant	Coffee Shop	Fast Food Restaurant	Furniture / Home Store	Dessert Shop	Food Court	Toy / Game Store	Grocery Store	Greek Restaurant
Islington Avenue	Toronto	Coffee Shop	Bakery	Sandwich Place	Grocery Store	Pizza Place	Restaurant	Fast Food Restaurant	Pub	Gym / Fitness Center	Thrift / Vintage Store
Don Mills	Toronto	Clothing Store	Coffee Shop	Fast Food Restaurant	Japanese Restaurant	Intersection	Baseball Field	Bakery	Sporting Goods Shop	Juice Bar	Restaurant
Islington	Toronto	Coffee Shop	Pub	Pizza Place	Fast Food Restaurant	Grocery Store	Tapas Restaurant	Sandwich Place	Sushi Restaurant	Italian Restaurant	Thai Restaurant
...	...	...	...	...	...	...	...	...	...	...	...
Westview	Metro Vancouver	Coffee Shop	Grocery Store	Fast Food Restaurant	Gym / Fitness Center	Sandwich Place	Chinese Restaurant	Sushi Restaurant	Park	Korean Restaurant	Persian Restaurant
Mahon	Metro Vancouver	Coffee Shop	Fast Food Restaurant	Sushi Restaurant	Grocery Store	Middle Eastern Restaurant	Mediterranean Restaurant	Pizza Place	Greek Restaurant	Bagel Shop	Chinese Restaurant
Marine-Hamilton	Metro Vancouver	Gym	Grocery Store	Restaurant	Pizza Place	Coffee Shop	Bank	Liquor Store	Sushi Restaurant	Thrift / Vintage Store	Brewery
Grand Boulevard	Metro Vancouver	Coffee Shop	Park	Middle Eastern Restaurant	Sushi Restaurant	Café	Sandwich Place	Japanese Restaurant	Grocery Store	Italian Restaurant	Falafel Restaurant
Upper Capilano	Metro Vancouver	Grocery Store	Coffee Shop	Gym	Fast Food Restaurant	Brewery	Pizza Place	Sushi Restaurant	Liquor Store	Bank	Restaurant

Figure 2 Cluster 0 Data Sample

Neighborhood	City	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
Harbourfront	Toronto	Coffee Shop	Hotel	Café	Park	Brewery	Gym	Japanese Restaurant	Scenic Lookout	Art Gallery	Baseball Stadium
Garden District	Toronto	Coffee Shop	Café	Gastropub	Japanese Restaurant	Italian Restaurant	Farmers Market	Vegetarian / Vegan Restaurant	Restaurant	Ramen Restaurant	Clothing Store
Ryerson	Toronto	Coffee Shop	Gastropub	Japanese Restaurant	Italian Restaurant	Theater	Park	Diner	Gay Bar	Ramen Restaurant	Clothing Store
Princess Gardens	Toronto	Coffee Shop	Hotel	Café	Park	Italian Restaurant	Gym	Scenic Lookout	Restaurant	Beer Bar	Yoga Studio
Martin Grove	Toronto	Coffee Shop	Café	Gastropub	Theater	Restaurant	Seafood Restaurant	Pizza Place	Sushi Restaurant	Furniture / Home Store	Plaza
Berczy Park	Toronto	Coffee Shop	Café	Seafood Restaurant	Hotel	Gastropub	Japanese Restaurant	Restaurant	Bakery	Art Gallery	Sporting Goods Shop
Adelaide	Toronto	Coffee Shop	Café	Hotel	Seafood Restaurant	Gastropub	Restaurant	Japanese Restaurant	Concert Hall	Plaza	Art Gallery
King	Toronto	Coffee Shop	Café	Restaurant	Seafood Restaurant	Gastropub	Hotel	Bakery	Japanese Restaurant	Concert Hall	Gym
Harbourfront East	Toronto	Coffee Shop	Hotel	Café	Park	Brewery	Gym	Japanese Restaurant	Scenic Lookout	Art Gallery	Baseball Stadium
Union Station	Toronto	Hotel	Café	Coffee Shop	Japanese Restaurant	Park	Concert Hall	Seafood Restaurant	Restaurant	Vegetarian / Vegan Restaurant	Farmers Market
Trinity	Toronto	Coffee Shop	Hotel	Boutique	Italian Restaurant	Café	Restaurant	French Restaurant	Park	Japanese Restaurant	Clothing Store
Toronto Dominion Centre	Toronto	Coffee Shop	Hotel	Café	Japanese Restaurant	Theater	Restaurant	Concert Hall	Vegetarian / Vegan Restaurant	Gastropub	Thai Restaurant
Design Exchange	Toronto	Coffee Shop	Hotel	Café	Seafood Restaurant	Japanese Restaurant	Gastropub	Restaurant	Concert Hall	Theater	Art Gallery

Figure 3 Cluster 1 Data Sample

Neighborhood	City	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
Regent Park	Toronto	Coffee Shop	Restaurant	Café	Bakery	Park	Thai Restaurant	Fast Food Restaurant	Breakfast Spot	Diner	Pub
Queen's Park	Toronto	Coffee Shop	Café	Park	Sushi Restaurant	Japanese Restaurant	Ramen Restaurant	Mexican Restaurant	Bubble Tea Shop	Theater	Italian Restaurant
St. James Town	Toronto	Coffee Shop	Restaurant	Japanese Restaurant	Gay Bar	Café	Diner	Juice Bar	Park	Gastropub	Thai Restaurant
Humewood-Cedarvale	Toronto	Pizza Place	Coffee Shop	Grocery Store	Restaurant	Sushi Restaurant	Indian Restaurant	Italian Restaurant	Café	Bakery	Bank
The Beaches	Toronto	Beach	Pub	Coffee Shop	Bakery	Breakfast Spot	Japanese Restaurant	Pizza Place	Health Food Store	Bar	Grocery Store
Central Bay Street	Toronto	Coffee Shop	Park	Italian Restaurant	Gourmet Shop	Hotel	Men's Store	French Restaurant	Bookstore	Ice Cream Shop	Grocery Store
Hillcrest Village	Toronto	Restaurant	Pizza Place	Italian Restaurant	Bakery	Ice Cream Shop	Coffee Shop	Indian Restaurant	Mexican Restaurant	Latin American Restaurant	BBQ Joint
Broadview North (Old East York)	Toronto	Greek Restaurant	Coffee Shop	Café	Bakery	Pub	Ice Cream Shop	Pizza Place	Italian Restaurant	Restaurant	Intersection
The Beaches West	Toronto	Beach	Pub	Coffee Shop	Bakery	Breakfast Spot	Japanese Restaurant	Pizza Place	Health Food Store	Bar	Grocery Store
Victoria Hotel	Toronto	Coffee Shop	Restaurant	Japanese Restaurant	Gay Bar	Café	Gastropub	Thai Restaurant	Diner	Italian Restaurant	Men's Store
Willowdale	Toronto	Coffee Shop	Japanese Restaurant	Grocery Store	Middle Eastern Restaurant	Sushi Restaurant	Ramen Restaurant	Sandwich Place	Bank	Pizza Place	Fried Chicken Joint
Bedford Park	Toronto	Coffee Shop	Sushi Restaurant	Sandwich Place	Bakery	Fast Food Restaurant	Pub	Restaurant	Italian Restaurant	Thai Restaurant	Grocery Store

Figure 4 Cluster 2 Data Sample

Neighborhood	City	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
Parkwoods	Toronto	Coffee Shop	Supermarket	Gas Station	Fast Food Restaurant	Pharmacy	Pizza Place	Café	Paper / Office Supplies Store	Sushi Restaurant	Bowling Alley
Victoria Village	Toronto	Middle Eastern Restaurant	Portuguese Restaurant	Thai Restaurant	Thrift / Vintage Store	Chinese Restaurant	Park	Asian Restaurant	Mediterranean Restaurant	Pet Store	Pizza Place
Humber Valley Village	Toronto	Park	Pharmacy	Grocery Store	Bank	Shopping Mall	Supermarket	Liquor Store	Skating Rink	Camera Store	Café
Malvern	Toronto	Fast Food Restaurant	Park	Grocery Store	Pharmacy	Pizza Place	Gym / Fitness Center	Sandwich Place	Salon / Barbershop	Bubble Tea Shop	Supermarket
Rouge	Toronto	Park	Trail	Bus Station	Gas Station	Campground	Fast Food Restaurant	Shopping Mall	Intersection	Flower Shop	Falafel Restaurant
...	...	...	...	...	...	...	...	...	...	...	...
Capilano	Metro Vancouver	Coffee Shop	Bank	Bakery	Gift Shop	Sandwich Place	Park	Candy Store	Liquor Store	Bridge	Scenic Lookout
Carisbrooke	Metro Vancouver	Coffee Shop	Convenience Store	Bar	Grocery Store	Park	Chinese Restaurant	Donut Shop	Trail	Sandwich Place	Café
Tempe	Metro Vancouver	Park	Coffee Shop	Fast Food Restaurant	Grocery Store	Bar	Theater	Shipping Store	Gym / Fitness Center	Donut Shop	Sandwich Place
Cedar Village	Metro Vancouver	Park	Grocery Store	Gym / Fitness Center	Pub	Baseball Field	Soccer Field	Pharmacy	Coffee Shop	Farm	Elementary School
Moodyville	Metro Vancouver	Breakfast Spot	Butcher	Moving Target	Ice Cream Shop	Japanese Restaurant	Park	Sandwich Place	Salon / Barbershop	Café	Escape Room

Figure 5 Cluster 3 Data Sample

Neighborhood	City	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
Christie	Toronto	Korean Restaurant	Café	Grocery Store	Coffee Shop	Ice Cream Shop	Pizza Place	Cocktail Bar	Italian Restaurant	Dessert Shop	Eastern European Restaurant
Bathurst Manor	Toronto	Korean Restaurant	Coffee Shop	Grocery Store	Café	Bakery	Pizza Place	Bookstore	Dessert Shop	Beer Bar	Japanese Restaurant
Dufferin	Toronto	Café	Bar	Coffee Shop	Bakery	Caribbean Restaurant	Park	Vietnamese Restaurant	Cocktail Bar	Restaurant	Italian Restaurant
Dovercourt Village	Toronto	Bar	Bakery	Café	Coffee Shop	Cocktail Bar	Grocery Store	Park	Pizza Place	Mexican Restaurant	Italian Restaurant
Little Portugal	Toronto	Bar	Café	Restaurant	Coffee Shop	Vegetarian / Vegan Restaurant	French Restaurant	Park	Cocktail Bar	Italian Restaurant	Japanese Restaurant
Riverdale	Toronto	Coffee Shop	Vietnamese Restaurant	Café	Park	Bakery	Bar	Restaurant	Fast Food Restaurant	Brewery	Pizza Place
Brockton	Toronto	Coffee Shop	Bar	Café	Bakery	Restaurant	Sandwich Place	Cocktail Bar	Gift Shop	Park	Thai Restaurant
Parkdale Village	Toronto	Coffee Shop	Restaurant	Bakery	Café	Bar	Tibetan Restaurant	Italian Restaurant	Diner	Park	Pharmacy
North Toronto West	Toronto	Café	Restaurant	Bar	Vegetarian / Vegan Restaurant	Italian Restaurant	Bakery	Furniture / Home Store	Yoga Studio	Cocktail Bar	Seafood Restaurant
The Annex	Toronto	Café	Italian Restaurant	Restaurant	Korean Restaurant	Bakery	Grocery Store	Vegetarian / Vegan Restaurant	Coffee Shop	Eastern European Restaurant	Gym
Parkdale	Toronto	Coffee Shop	Restaurant	Bakery	Café	Bar	Tibetan Restaurant	Italian Restaurant	Diner	Park	Pharmacy
University of Toronto	Toronto	Café	Bakery	Italian Restaurant	Coffee Shop	Vegetarian / Vegan Restaurant	Bookstore	Restaurant	Hotel	Japanese Restaurant	Park

Figure 6 Cluster 4 Data

5. Discussion

5.1 Limitations

Although this comparison shows the neighborhoods characteristics, it could not explain the reason. For example, the clustering of neighborhood could not answer for the question "Why Thai restaurant is more popular in Toronto?" or "Why Metro Vancouver has less category of venues than Toronto?"

5.2 Issues

Cleaning the venue categories is needed. For example, three Tim Hortons are found in the Parkwoods neighborhood in Toronto and two of them are categorized as a coffee shop and one of them is a café. What is the difference between café and coffee shop? The definition for a category may confuse to apply. The category should be cleaned to guarantee data integrity.

6. Conclusion

Toronto and Metro Vancouver are similar in population however two cities different in several ways. Toronto is more diverse in venues and the number of venues is also much more than Metro Vancouver. The clustering results show the differences between the two cities. Unlike Toronto, Metro Vancouver did not have a neighborhood classified in the downtown area which

is a mixed form of the city center and commercial area. In addition, it did not mean Toronto is better city to the new immigrants.