

# Neighborhood Comparison

## - Battle of Neighborhood -

2021.02.18

Jong Seob Shin

# Introduction

- **Toronto and Vancouver**
  - Well-known cities
  - The most preferred cities to new immigrants to Canada
- **Questions from new immigrants**
  - Which city is better?
  - Where to live?
  - Where is the best place to open my own business?
- **Answers**
  - Very subjective
  - Not sufficient information
- **Location information**
  - Neighborhoods, venues, and category of venue
  - Basis on decision making
  - Objective approach

# Datasets

- **Toronto**

- The largest city in Canada
- Population: 2.7 million
- The most preferred city for new immigrants
- About 200 neighborhoods

- **Metro Vancouver**

- a federation of 21 municipalities, one Electoral Area and one Treaty First Nation
- Population: 2.4 million
- The 2nd preferred city for new immigrants
- 7 municipalities of Metro Vancouver: Vancouver, West Vancouver, North Vancouver, Burnaby, Surrey, Coquitlam, and Richmond

# Source of Data

- **From Wikipedia**
  - List of neighborhoods of Toronto and city of Vancouver
  - Toronto Neighborhoods  
([https://en.wikipedia.org/wiki/List\\_of\\_postal\\_codes\\_of\\_Canada:\\_M](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](https://en.wikipedia.org/wiki/List_of_neighbourhoods_in_Vancouver))
- **Other sources for 6 cities in Metro Vancouver**
  - West Vancouver, North Vancouver, Burnaby, Surrey, Coquitlam, and Richmond
  - Home pages of the cities and other Internet sites (saved to CSV file)

# Source of Data

- **Coordinates of Neighborhoods**
  - Using geopy
  - Missing some neighborhoods coordinates
- **Venue Information**
  - Using Foursquare APIs
  - Limiting 100 venues within 1,000m radius from the coordinates of a neighborhood

# Neighborhood and Venue Information

- **Number of Neighborhoods and Venues**

- Note: Number of Venues are different day by day.

	Toronto	Metro Vancouver
Number of Neighborhoods	208	137
Neighborhoods with Coordinates	195	122
Number of Venues	More than 10,000	More than 4,000
Number of Venue Categories	359	294

# The Most Common Venues

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

# Neighborhood Clustering

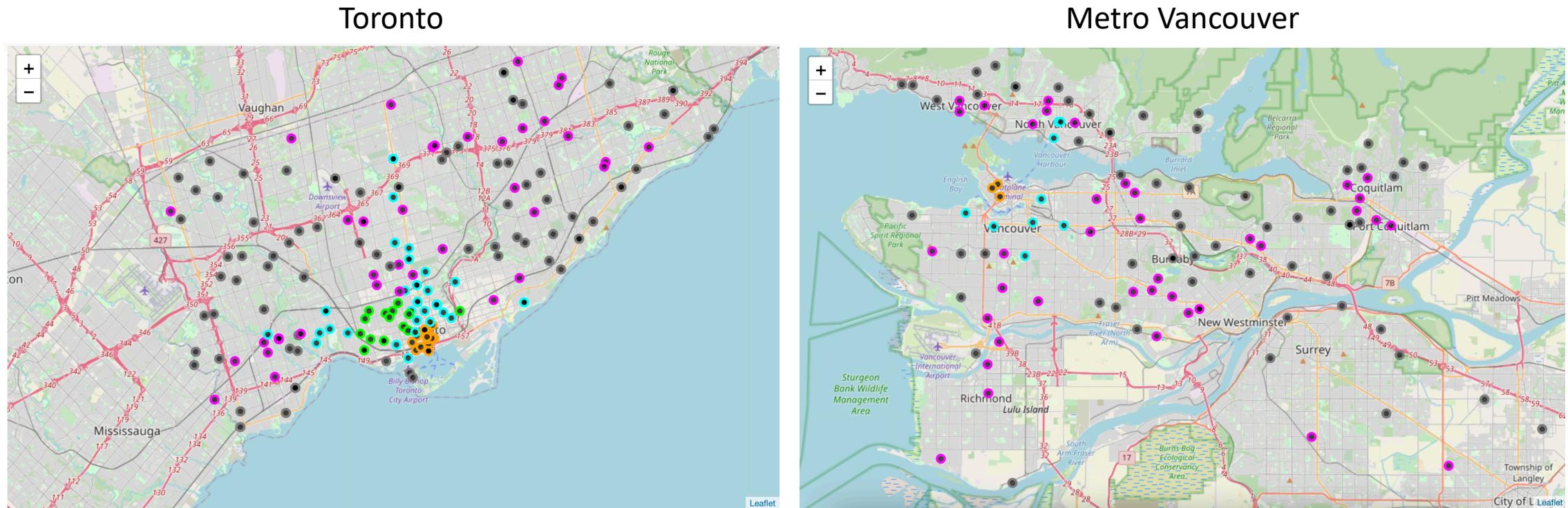
- **Clustering Algorithm**

- K-Means Clustering
- 5 Clusters
- Top 10 common venues for each neighborhood

- **Neighborhoods Cluster**

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	

# Cluster Location



# Cluster Classification

- **Cluster 0**
  - Semi-commercial and residential area
  - 73 neighborhoods and 50 venues on average
- **Cluster 1**
  - City Center or Downtown Center
  - High rank of Hotels and concert halls
  - 23 neighborhoods
- **Cluster 2**
  - Commercial Area
  - Near the city center
  - 52 neighborhoods
- **Cluster 3**
  - Residential Area
  - 153 neighborhoods
  - Less than 20 venues on average
- **Cluster 4**
  - Downtown Area
  - Near the city center
  - Only in Toronto and 16 neighborhoods
  - 100 venues on average

# Discussions

- **Shows neighborhoods characteristics**
  - Could not explain the reasons for the questions like “Why Thai restaurant is more popular in Toronto?” or “Why Metro Vancouver has less category of venues than Toronto?”
- **Data Integrity Issue**
  - Venue category from Foursquare do not have data integrity.
  - 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.

# Conclusions

- Toronto is more diverse in venues.
- Toronto has more venues than Metro Vancouver.
- 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.
- It did not mean Toronto is better city to the new immigrants.
- It shows the differences between two cities.