Capstone Project: Battle of Neighbourhoods in Toronto

by

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Table of Contents

Contents

1   Introduction

1.1   Background and Business Problem

There are over 2.7 million people living in Toronto and there are over 8,000 residential sales every month. It is important for these buyers to know where to purchase their homes. I intend to analyze how neighbourhoods within Toronto are different from each other in terms of existing venues. The goal of this report is to provide an up-to-date analysis to compare the advantages in different neighbourhoods in Toronto. And it will provide customers the information on what is available in different parts of Toronto.

1.2   Data

The information of neighbourhoods was gathered from a Wikipedia page (https://en.wikipedia.org/wiki/List_of_postal_codes_of_Canada:_M). I will utilize this information with the venue categories information from Foursquare on April, 2019 to group similar neighbourhoods based on their location and top venues.

2   Methodology

The venues in each neighbourhood were one-hot encoded as the input to machine learning algorithm. The Density-based spatial clustering of applications with noise (DBSCAN) method was applied to cluster neighbourhood. It was used to differentiate special neighbourhoods from the rest. And the parameter values were selected to generate less than 10 clusters.

3   Results

3.1   Cluster 0: Most neighbourhoods have similar venues

As shown in Figure 1, most neighbourhoods are in Cluster 0 (red). They are surrounded by

coffee shops, restaurants, and glossary stores (Table 1). But the main feature of these

neighbourhoods is that they are close to parks (red box in Table 1). It proves that the City of

Toronto has many parks distributed in different neighbourhoods.
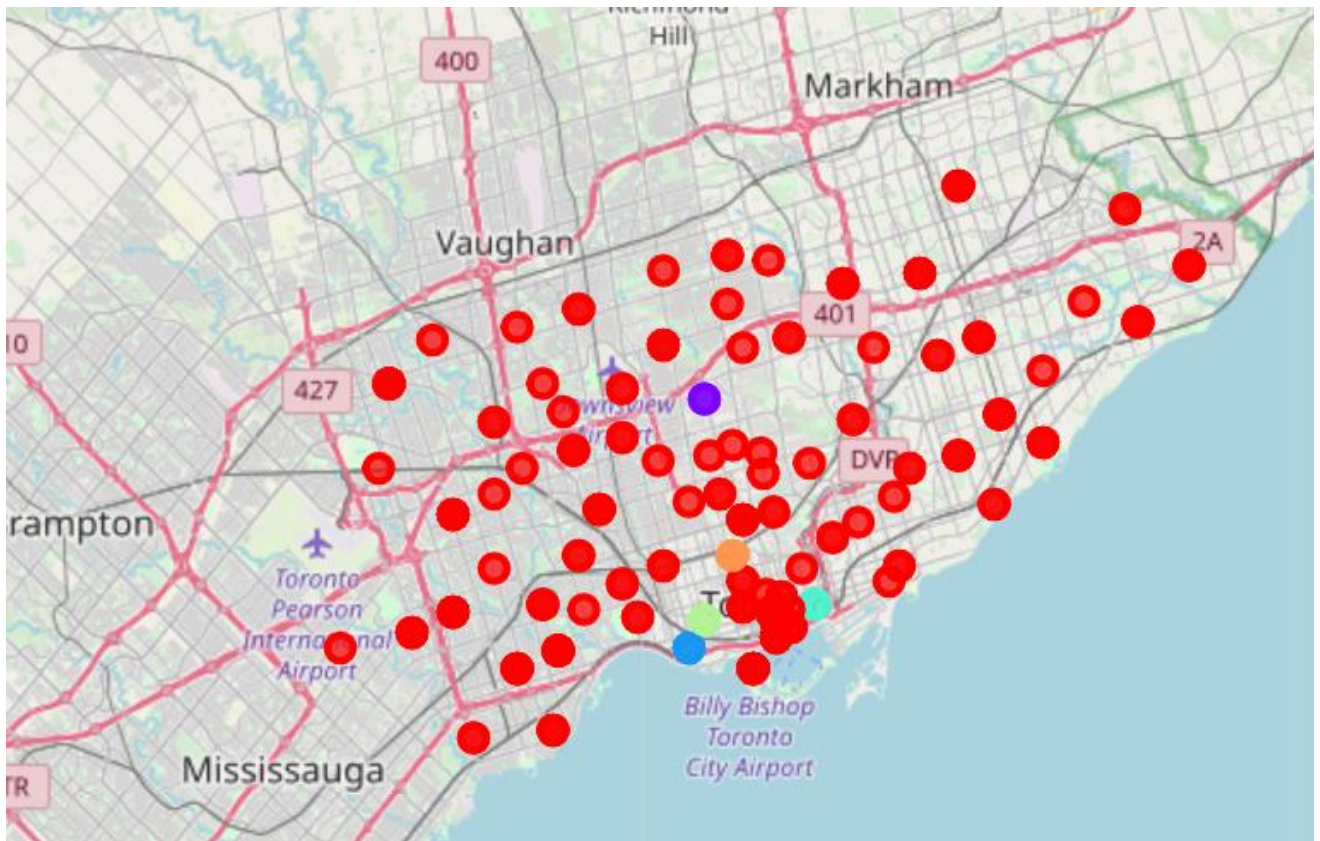

Figure 1. Clusters identified by BDSCAN. Most neighbourhoods are in Cluster 0. Red: Cluster 0,
Purple: Cluster 1, Blue: Cluster 2, Cyan: Cluster 3, Green: Cluster 4, Orange: Cluster 5.

Cluster	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
0	Coffee Shop	Park	Pizza Place	Café	Sandwich Place	Bakery	Italian Restaurant	Grocery Store	Fast Food Restaurant	Restaurant
1	Accessories Store	Juice Bar	Coffee Shop	Bakery	Sports Club	Bank	Italian Restaurant	Sushi Restaurant	Fast Food Restaurant	Boutique
2	Hotel	Indian Restaurant	Bakery	Tibetan Restaurant	Coffee Shop	Café	Vegetarian / Vegan Restaurant	Restaurant	Furniture / Home Store	Bar
3	Pub	Diner	Breakfast Spot	Park	Coffee Shop	Café	Sushi Restaurant	Restaurant	Italian Restaurant	Theater
4	Men's Store	Italian Restaurant	Bakery	Asian Restaurant	Coffee Shop	Café	Vegetarian / Vegan Restaurant	Restaurant	Cocktail Bar	Bar
5	Pub	Museum	Bakery	Grocery Store	Coffee Shop	Café	Vegetarian / Vegan Restaurant	Restaurant	Italian Restaurant	Pizza Place

Table 1. Top 10 common venues in each cluster. The different features are highlighted in colored boxes.

3.2 Cluster 1 (Lawrence Manor East): Wealthy neighbourhood

Lawrence Manor East neighbourhood is in cluster 1. It is identified as one of the wealthy neighbourhood because the top venue is Accessories Store and it has Sports Club nearby (boxes in Table 1).

3.3 Cluster 2 (Parkdale Village): Hotels

The top venue in Parkdale Village (Cluster 2) is Hotel (boxes in Table 1), suggesting it is for visitors to Toronto. It is located near Lake Ontario, suggesting it has a good view. The location is also convenient because one of the major highways is close to this neighbourhoods

3.4 Cluster 3 (Regent Park): Entertainments

Regent Park neighbourhood (Cluster 3) offers a lot of options for entertainment (Boxes in Table 1). It is a great place to hang out at night or on weekends.

3.5 Cluster 4 (Trinity): Foods

Trinity neighbourhood (Cluster 4) offers a lot of options for food (Boxes in Table 1), such as Italian, Asian, Vegetarian/Vegan Restaurants. It is great for people who wants to try out different foods.

3.6 Cluster 5 (Yorkville): Museums

Museum is in the top venues of Yorkville neighbourhood (Cluster 5) which is different from other clusters. It is great for people who has a passion for a specific subject and wants to visit museum on a regular bases.

4   Discussion

All neighbourhoods in Toronto were clustered into 6 clusters. Most of them are in Cluster 0. Five other neighbourhoods were shown as different from the main cluster. Their features are mentioned in previous section. For home buyers, I do not advise to purchase in the Parkdale Village neighbourhood as it is mostly for visitors. While other 4 neighbourhoods have unique features which can help home buyers to decide.

5   Conclusion

I intend to provide an up-to-date analysis to compare different neighbourhoods in Toronto. To this end, I applied BDSCAN to cluster venues available in each neighbourhood. Unique neighbourhoods were identified. This information can help home buyers to know the difference among neighbourhoods in Toronto.