

Opening a Restaurant in Toronto, Ontario

I. Introduction

Toronto is the capital city of the Canadian province of Ontario. It is the largest city in the country with a population of 2,734,571. This booming city is home to a diverse group of residents. Toronto offers many opportunities including a prominent restaurant scene. When opening a new restaurant location is a crucial decision. In this analysis we will compare Toronto neighborhoods to determine the best place for opening a new restaurant.

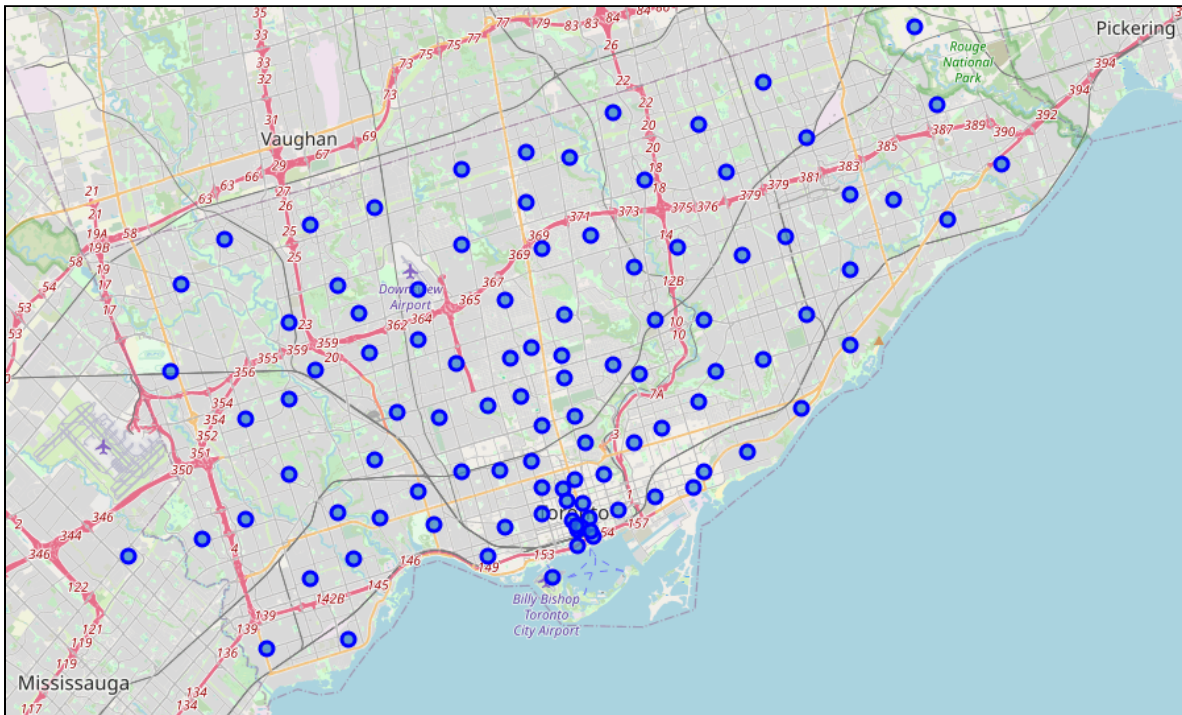


Figure 1: Map of Toronto neighborhoods

II. Data

This data set is compiled from multiple web based sources. Information about the different neighborhoods and boroughs of Toronto was webscraped using the BeautifulSoup package from Wikipedia. This was combined with geospatial data providing the latitude and longitude coordinates for each neighborhood. These coordinates were from a csv file provided by the Coursera Applied Data Science Capstone course. Information on the current venues in each neighborhood was

gathered using the Foursquare API. This provided the venue name, latitude and longitude, venue category and which neighborhood the venue was located in. Three neighborhoods did not have any data so they were removed from the dataset. The dataset was grouped by neighborhood and showed the frequency of each type of venue in that neighborhood. This was used to determine the top 10 types of venues in each neighborhood.

III. Methodology

To determine the best location for a restaurant, neighborhoods were grouped using k means clustering. The goal is to determine which neighborhoods currently feature many restaurants which will support the addition of a new restaurant. The neighborhoods were split into five clusters based on the similarity of their venues.

IV. Results

The map below illustrates the five clusters each neighborhood was broken into. A large majority of the neighborhoods fall into cluster zero.

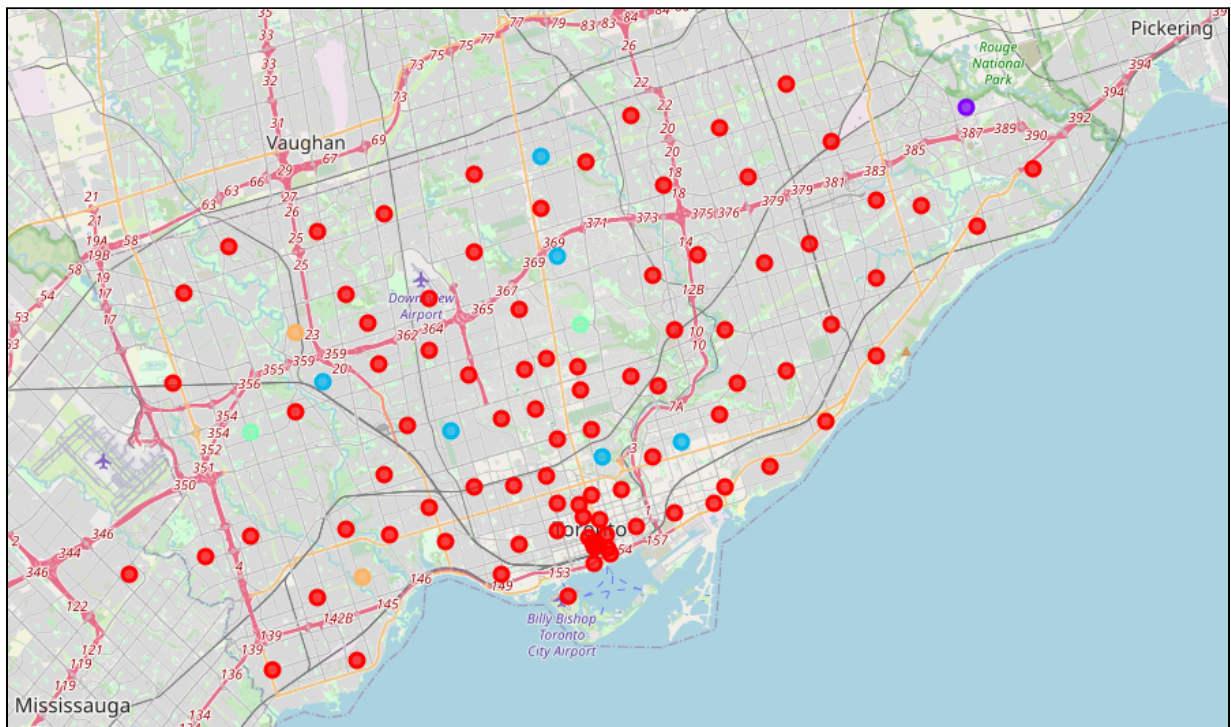


Figure 2: Map of neighborhoods clustered by venue similarity

The bar graph below shows the distribution of the neighborhoods in each cluster.

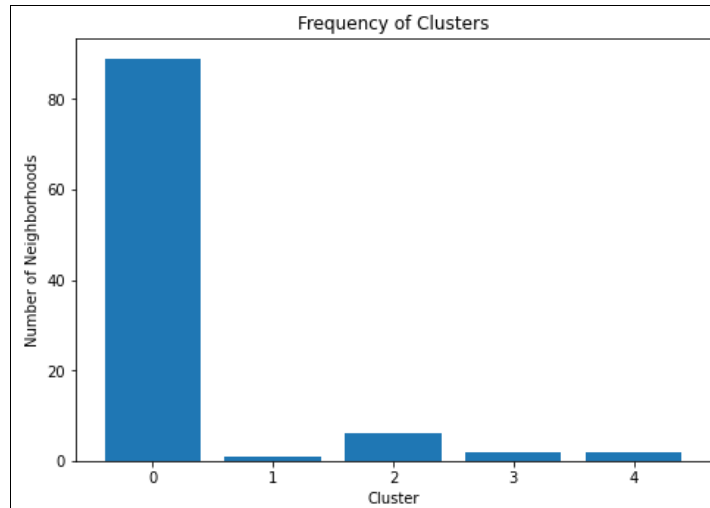


Figure 3: Number of neighborhoods by cluster

To learn more about the types of venues in each cluster the following tables were produced. They display the top 10 most common venues in each neighborhood grouped by cluster.

	Borough	Cluster Labels	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	North York	0	Food & Drink Shop	Fast Food Restaurant	Park	Yoga Studio	Discount Store	Distribution Center	Dive Bar	Dog Run	Doner Restaurant	Donut Shop
1	North York	0	Pizza Place	Coffee Shop	Portuguese Restaurant	Intersection	Hockey Arena	Dog Run	Dim Sum Restaurant	Diner	Discount Store	Distribution Center
2	Downtown Toronto	0	Coffee Shop	Café	Park	Bakery	Pub	Theater	Beer Store	Bank	Chocolate Shop	French Restaurant
3	North York	0	Clothing Store	Accessories Store	Vietnamese Restaurant	Miscellaneous Shop	Coffee Shop	Furniture / Home Store	Boutique	Construction & Landscaping	Ethiopian Restaurant	Escape Room
4	Queen's Park	0	Coffee Shop	Sushi Restaurant	Café	Diner	Yoga Studio	Park	Beer Bar	Smoothie Shop	Burrito Place	Sandwich Place
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Figure 4: Most common venues in cluster zero (Note: not all neighborhoods are shown)

	Borough	Cluster Labels	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
6	Scarborough	1	Fast Food Restaurant	Dim Sum Restaurant	Event Space	Ethiopian Restaurant	Escape Room	Electronics Store	Eastern European Restaurant	Dumpling Restaurant	Drugstore	Donut Shop

Figure 5: Most common venues in cluster one

	Borough	Cluster Labels	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
21	York	2	Park	Women's Store	Pool	Yoga Studio	Donut Shop	Diner	Discount Store	Distribution Center	Dive Bar	Dog Run
35	East York/East Toronto	2	Park	Convenience Store	Yoga Studio	Drugstore	Discount Store	Distribution Center	Dive Bar	Dog Run	Doner Restaurant	Donut Shop
52	North York	2	Park	Yoga Studio	Drugstore	Discount Store	Distribution Center	Dive Bar	Dog Run	Doner Restaurant	Donut Shop	Dumpling Restaurant
64	York	2	Park	Yoga Studio	Drugstore	Discount Store	Distribution Center	Dive Bar	Dog Run	Doner Restaurant	Donut Shop	Dumpling Restaurant
66	North York	2	Park	Convenience Store	Yoga Studio	Drugstore	Discount Store	Distribution Center	Dive Bar	Dog Run	Doner Restaurant	Donut Shop
91	Downtown Toronto	2	Park	Playground	Trail	Yoga Studio	Doner Restaurant	Diner	Discount Store	Distribution Center	Dive Bar	Dog Run

Figure 6: Most common venues in cluster two

	Borough	Cluster Labels	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
61	Central Toronto	3	Park	Bus Line	Swim School	Yoga Studio	Doner Restaurant	Discount Store	Distribution Center	Dive Bar	Dog Run	Donut Shop
77	Etobicoke	3	Park	Sandwich Place	Mobile Phone Shop	Bus Line	Yoga Studio	Doner Restaurant	Distribution Center	Dive Bar	Dog Run	Donut Shop

Figure 7: Most common venues in cluster three

	Borough	Cluster Labels	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
57	North York	4	Baseball Field	Yoga Studio	Donut Shop	Discount Store	Distribution Center	Dive Bar	Dog Run	Doner Restaurant	Drugstore	Farmers Market
101	Etobicoke	4	Baseball Field	Yoga Studio	Donut Shop	Discount Store	Distribution Center	Dive Bar	Dog Run	Doner Restaurant	Drugstore	Farmers Market

Figure 8: Most common venues in cluster four

V. Discussion

Based on the results of the k means clustering the five clusters are uniquely different from one another. Cluster zero, the largest cluster, has a large assortment of restaurants, shopping and leisure activities. Cluster one only has one neighborhood and has a high frequency of fast food restaurants. Cluster two and three have parks and other leisure activities. Cluster four has baseball fields and several smaller shops.

VI. Conclusion

Based on the findings there are many great neighborhoods to locate a new restaurant in Toronto. My recommendation would be to place a new restaurant in one of the neighborhoods in cluster zero as there are many restaurants there already.