

# Capstone Project

# Identify Suitable Neighbourhoods for New Residents and Franchise Owners

# Introduction

- This project will focus on the problems people face when choosing a neighbourhood to live in Toronto based on their preference of public/private lifestyle and what amenities and venues (if any) are closest and most visited.



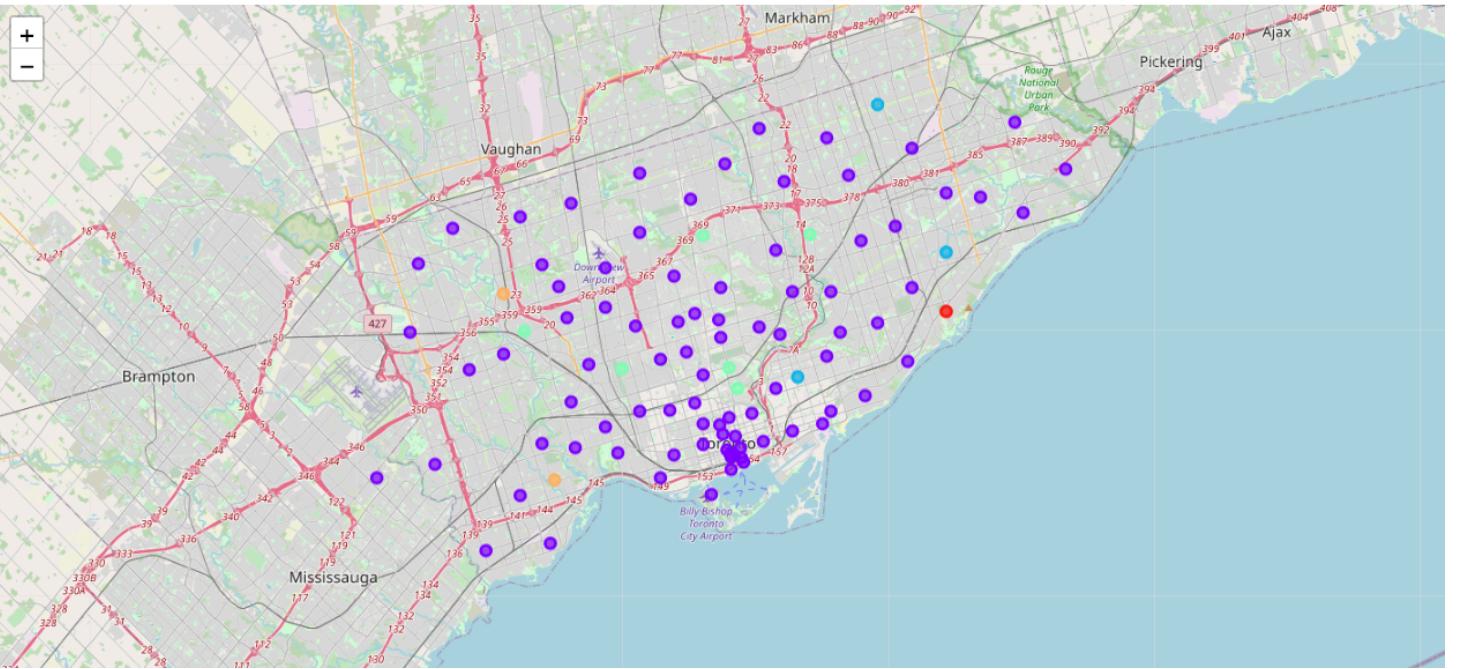
# Objectives

- To focus on new residents and people who wish to relocate within the city. While locations can be scouted or mapped accordingly beforehand, there is no way of knowing the traffic of amenities and venues near your location (i.e. parks, restaurants) and whether they are commonly visited.
- This project will list the most common venues for each cluster of neighbourhoods.
- This project will also target urban planners and franchise owners who want to expand their businesses to new locations, based on frequency of traffic in local venues. Decisions can therefore be made according to the preferred location for residence or business operation.

# Data

- Publicly provided lists of Toronto neighbourhoods will be used to create clusters from Wikipedia
- Longitude and Latitude Data will also be used and mapped accordingly
- Also venue information and location data will be pulled from Foursquare using my account.

# Data



# Methodology

\*Highlights of Methodology (See report for full listing)

- Collected all nearby venues
- Analyzed the neighborhoods
- Sorted the data in
- Categorizing/ordering the neighborhoods.
- Using clustering by Run K means
- Created new data frames
- Created maps



# Methodology

## Checking Dataframe Result

```
In [30]: toronto_venues.head(10)
```

Out[30]:

Neighborhood	Neighbourhood	Latitude	Neighbourhood	Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
0	Parkwoods	43.753259	-79.329656		Brookbanks Park	43.751976	-79.332140	Park
1	Parkwoods	43.753259	-79.329656		Variety Store	43.751974	-79.332114	Food & Drink Shop
2	Victoria Village	43.725882	-79.315572		Victoria Village Arena	43.723481	-79.315635	Hockey Arena
3	Victoria Village	43.725882	-79.315572		Tim Hortons	43.725517	-79.313103	Coffee Shop
4	Victoria Village	43.725882	-79.315572		Portugril	43.725819	-79.312785	Portuguese Restaurant
5	Victoria Village	43.725882	-79.315572		The Frig	43.7227051	-79.317418	French Restaurant
6	Victoria Village	43.725882	-79.315572	Eglinton Ave E & Sloane Ave/Bermondsey Rd	43.726086	-79.313620	Intersection	
7	Victoria Village	43.725882	-79.315572		Pizza Nova	43.725824	-79.312860	Pizza Place
8	Regent Park, Harbourfront	43.654260	-79.360636		Roselle Desserts	43.653447	-79.362017	Bakery
9	Regent Park, Harbourfront	43.654260	-79.360636		Tandem Coffee	43.653559	-79.361809	Coffee Shop

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## Grouping

```
In [37]: toronto_grouped = toronto_onehot.groupby('Neighborhood').mean().reset_index()
```

# Methodology

	Postal code	Borough	Neighborhood	Latitude	Longitude	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	M3A	North York	Parkwoods	43.753259	-79.329656	3.0	Food & Drink Shop	Park	Drugstore	Diner	Discount Store	Distribution Center	Dog Run	Doner Restaurant	Donut Shop	Yoga Studio
1	M4A	North York	Victoria Village	43.725882	-79.315572	1.0	Pizza Place	Coffee Shop	Intersection	French Restaurant	Portuguese Restaurant	Hockey Arena	Eastern European Restaurant	Electronics Store	Drugstore	Dessert Shop
2	M5A	Downtown Toronto	Regent Park, Harbourfront	43.654260	-79.360636	1.0	Coffee Shop	Bakery	Pub	Park	Breakfast Spot	Café	Theater	Yoga Studio	Cosmetics Shop	Shoe Store
3	M6A	North York	Lawrence Manor, Lawrence Heights	43.718518	-79.464763	1.0	Clothing Store	Furniture / Home Store	Coffee Shop	Event Space	Shoe Store	Sporting Goods Shop	Miscellaneous Shop	Arts & Crafts Store	Accessories Store	Boutique
4	M7A	Downtown Toronto	Queen's Park, Ontario Provincial Government	43.662301	-79.389494	1.0	Coffee Shop	Sushi Restaurant	Diner	Burger Joint	Burrito Place	Juice Bar	Café	Japanese Restaurant	Italian Restaurant	Beer Bar

# Results

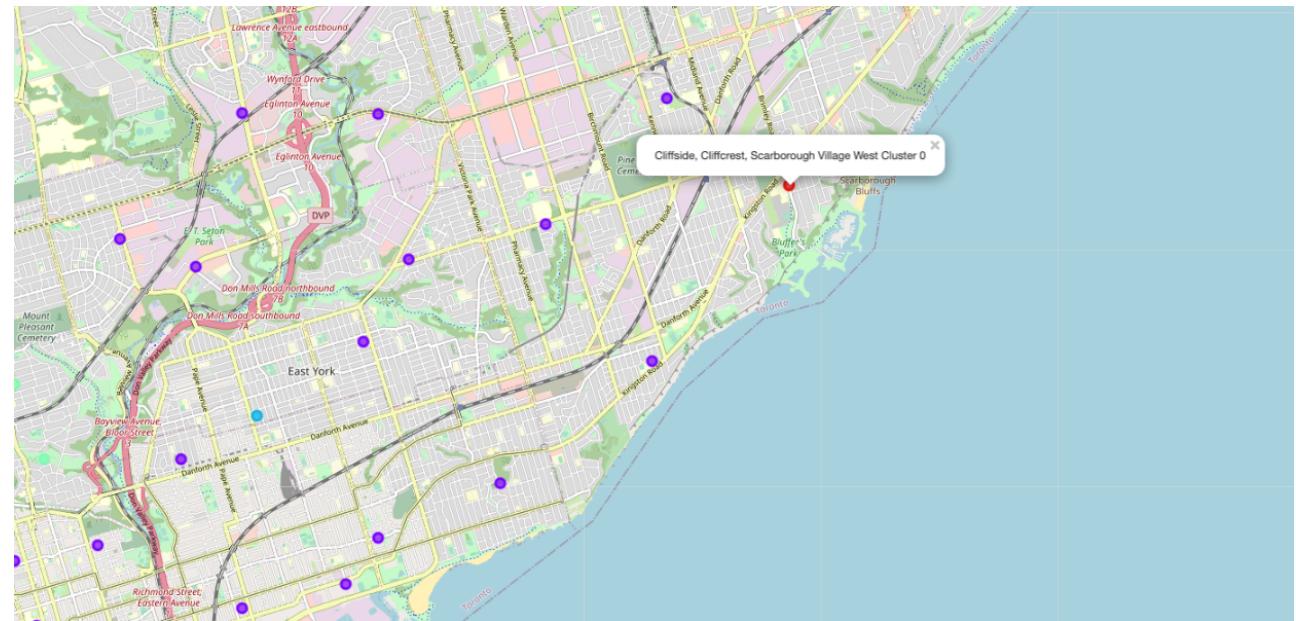
- New clusters created a visual for potential residents and franchise owners while plotting their preferred neighborhood based on the according clusters.
- Each option lists the Most Common Venues from 1<sup>st</sup> to 10<sup>th</sup>



# Results

## Cluster 0

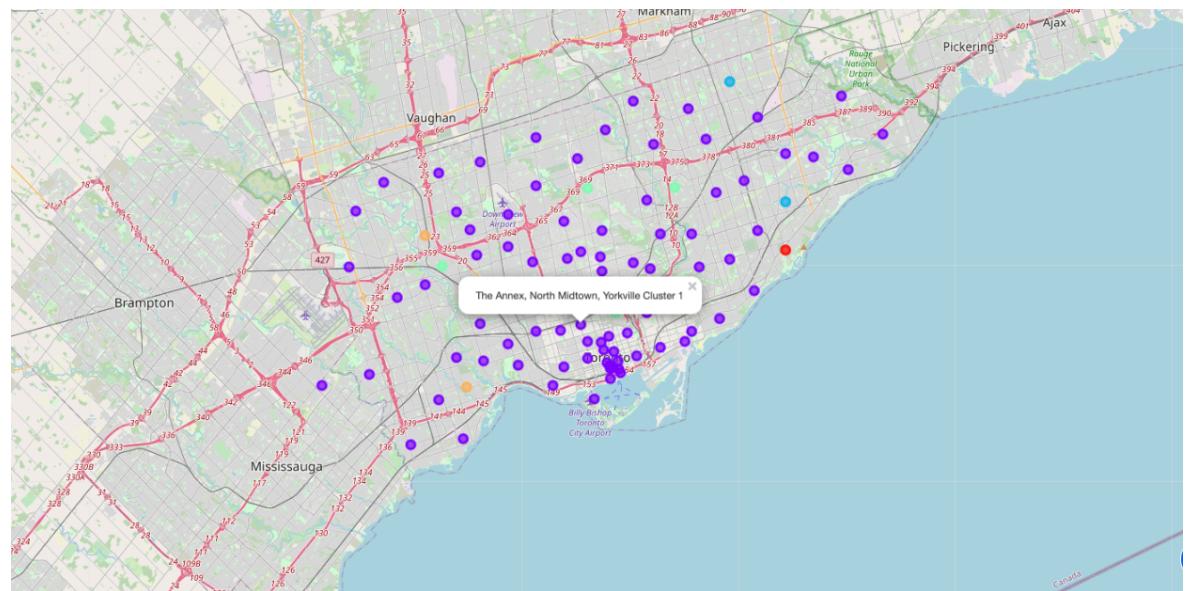
Borough	Cluster_Labels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue	9th Most Common Venue	10th Most Common Venue
51 Scarborough	0	American Restaurant	Motel	Drugstore	Diner	Discount Store	Distribution Center	Dog Run	Doner Restaurant	Donut Shop	Yoga Studio



# Results

## Cluster 1

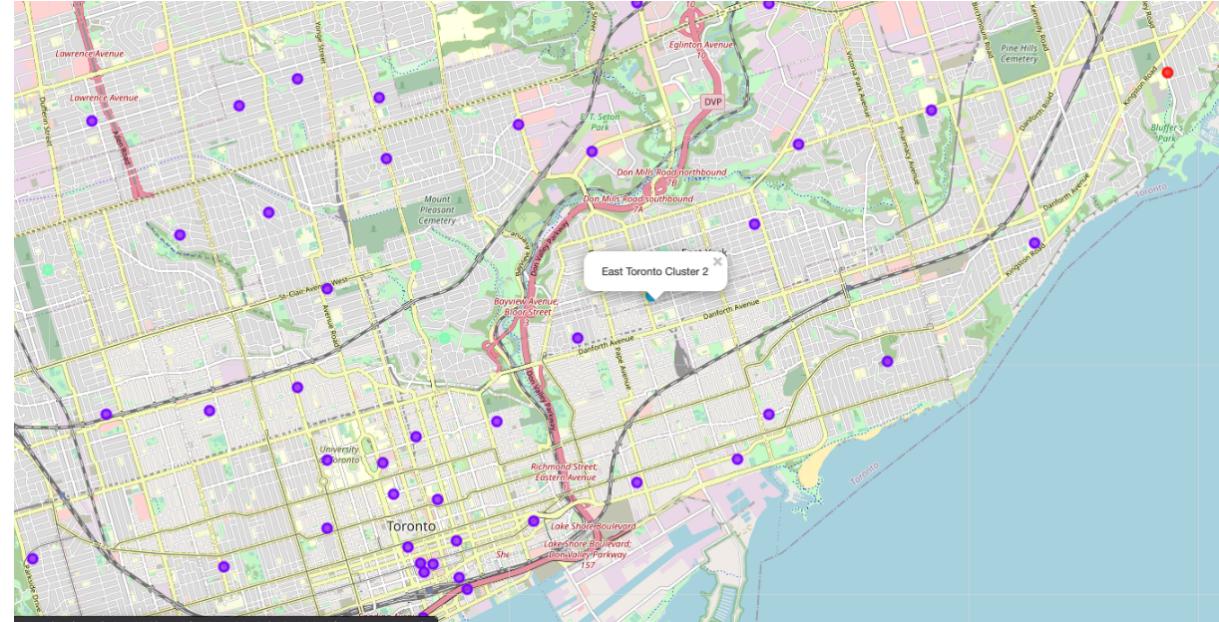
Borough	Cluster_Labels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue	9th Most Common Venue	10th Most Common Venue	
1	North York	1	Pizza Place	Coffee Shop	Intersection	French Restaurant	Portuguese Restaurant	Hockey Arena	Eastern European Restaurant	Electronics Store	Drugstore	Dessert Shop
2	Downtown Toronto	1	Coffee Shop	Bakery	Pub	Park	Breakfast Spot	Café	Theater	Yoga Studio	Cosmetics Shop	Shoe Store
3	North York	1	Clothing Store	Furniture / Home Store	Coffee Shop	Event Space	Shoe Store	Sporting Goods Shop	Miscellaneous Shop	Arts & Crafts Store	Accessories Store	Boutique
4	Downtown Toronto	1	Coffee Shop	Sushi Restaurant	Diner	Burger Joint	Burrito Place	Juice Bar	Café	Japanese Restaurant	Italian Restaurant	Beer Bar
6	Scarborough	1	Fast Food Restaurant	Print Shop	Dim Sum Restaurant	Diner	Discount Store	Distribution Center	Dog Run	Doner Restaurant	Yoga Studio	Dessert Shop
7	North York	1	Gym	Beer Store	Restaurant	Japanese Restaurant	Coffee Shop	Asian Restaurant	Dim Sum Restaurant	Sandwich Place	Bike Shop	Sporting Goods Shop
8	East York	1	Pizza Place	Gastropub	Pharmacy	Gym / Fitness Center	Breakfast Spot	Fast Food Restaurant	Intersection	Bank	Athletics & Sports	Pet Store
	Donwtown										Middle Eastern	



# Results

## Cluster 2

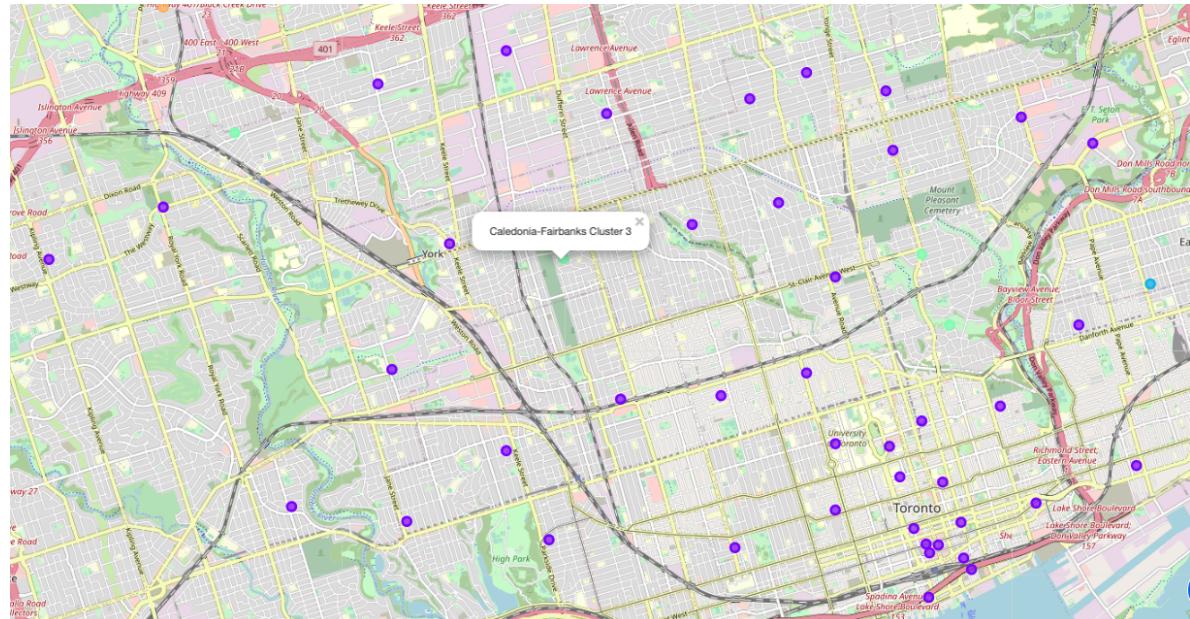
Borough	Cluster_Labels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue	9th Most Common Venue	10th Most Common Venue	
32	Scarborough	2	Playground	Yoga Studio	Donut Shop	Dim Sum Restaurant	Diner	Discount Store	Distribution Center	Dog Run	Doner Restaurant	Drugstore
35	East York	2	Park	Coffee Shop	Convenience Store	Yoga Studio	Donut Shop	Diner	Discount Store	Distribution Center	Dog Run	Doner Restaurant
85	Scarborough	2	Playground	Park	Coffee Shop	Yoga Studio	Donut Shop	Diner	Discount Store	Distribution Center	Dog Run	Doner Restaurant



# Results

## Cluster 3

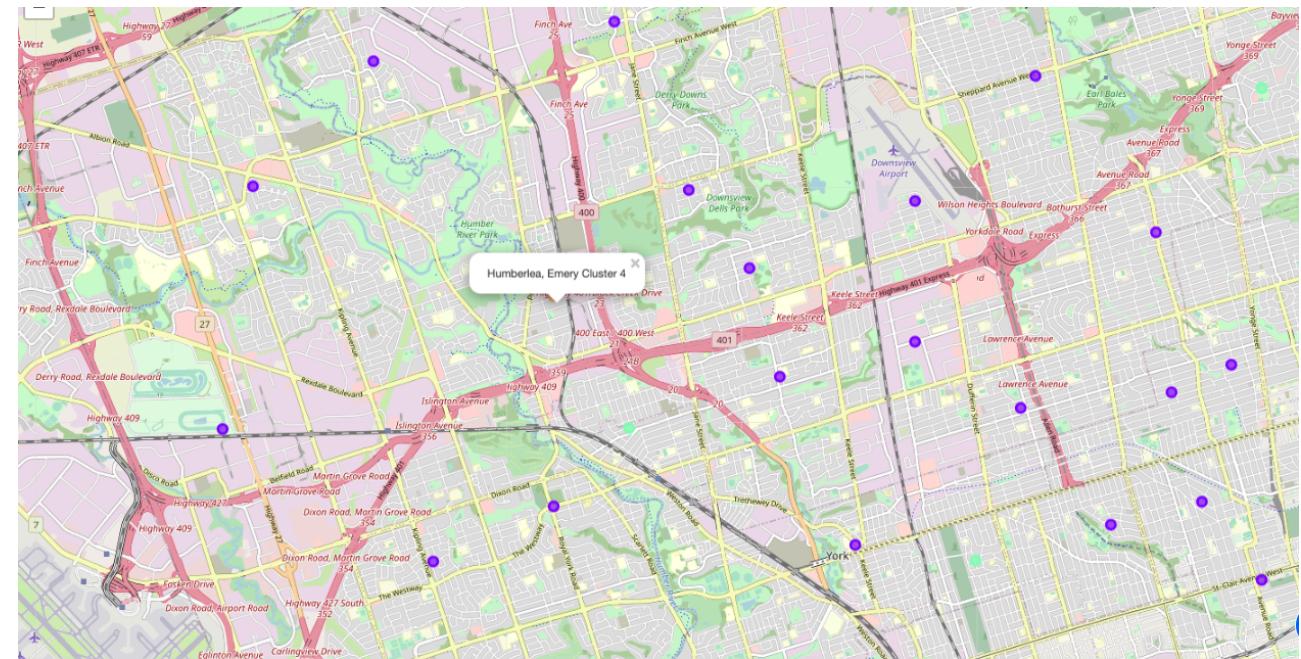
	Borough	Cluster_Labels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue	9th Most Common Venue	10th Most Common Venue
0	North York	3	Food & Drink Shop	Park	Drugstore	Diner	Discount Store	Distribution Center	Dog Run	Doner Restaurant	Donut Shop	Yoga Studio
21	York	3	Park	Women's Store	Spa	Drugstore	Discount Store	Distribution Center	Dog Run	Doner Restaurant	Donut Shop	Electronics Store
64	York	3	Park	Yoga Studio	Drugstore	Diner	Discount Store	Distribution Center	Dog Run	Doner Restaurant	Donut Shop	Eastern European Restaurant
66	North York	3	Park	Convenience Store	Bank	Bar	Yoga Studio	Drugstore	Distribution Center	Dog Run	Doner Restaurant	Donut Shop
83	Central Toronto	3	Park	Yoga Studio	Drugstore	Diner	Discount Store	Distribution Center	Dog Run	Doner Restaurant	Donut Shop	Eastern European Restaurant
91	Downtown Toronto	3	Park	Playground	Trail	Yoga Studio	Doner Restaurant	Dim Sum Restaurant	Diner	Discount Store	Distribution Center	Dog Run



# Results

## Cluster 4

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	Paper / Office Supplies Store	Baseball Field	Yoga Studio	Drugstore	Discount Store	Distribution Center	Dog Run	Doner Restaurant	Donut Shop	Eastern European Restaurant
101	Etobicoke	4	Baseball Field	Yoga Studio	Drugstore	Discount Store	Distribution Center	Dog Run	Doner Restaurant	Donut Shop	Eastern European Restaurant	Filipino Restaurant



# Discussion

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Based on the labelled clusters, users have a graphic understanding of commonly visited venues according to neighbourhood, according to their relationship with nearby clusters. Important note - the selected locations for each cluster are approximate and chosen to highlight the surrounding area.

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Certain clusters (specifically 1 and 2) involve predominant retail and restaurant venues as the most commonly visited according to Foursquare. However the outer clusters of Toronto's main city area, list parks and recreation more commonly in their top venues



# Discussion

Recommendations for franchise owners would involve the avoidance of clustered areas that already contain similar businesses. However usage of parks and recreation spaces (especially those commonly visited in downtown clusters) may prove useful if they acquire permits for sales.



Dependent on the owner's preference, however the results illustrate a perspective on the difference of commonly visited venues away from the city centre. Specifically useful to note the remains of common food venues regardless of the neighborhood or its distance from the city centre.



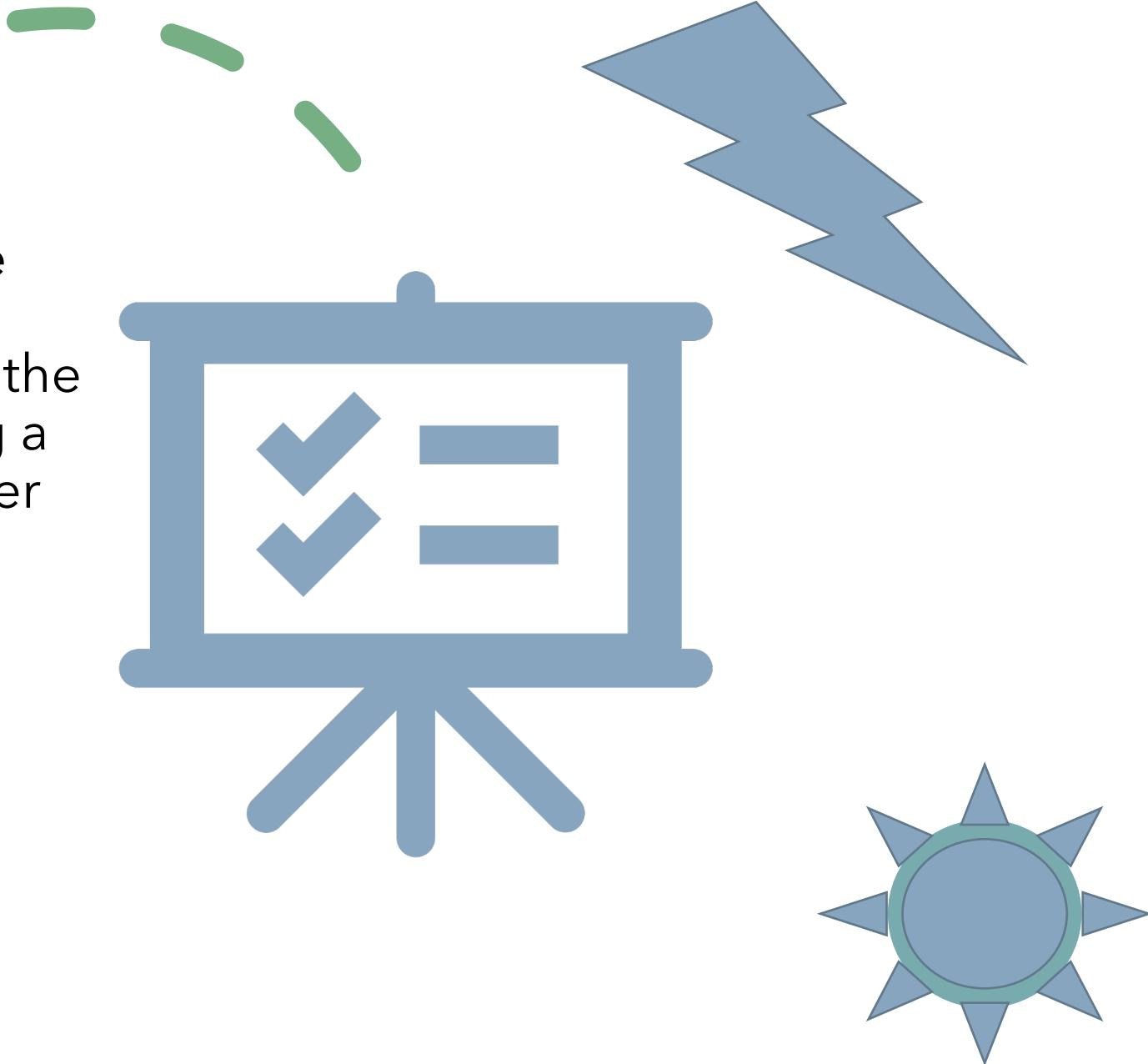
# Conclusion

- The details in this report only remotely reflect multiple moving constants. Therefore it may be difficult to apply the findings while many other factors should be considered. It is also limited to the Foursquare inputs, which may be subject to change.



# Conclusion

- Weather factors may change the visitation of most venues (i.e. indoor vs outdoor, according to the season). Thus I believe including a recent seasonal report may better provide the customer with substantial knowledge when seeking franchise locations.





**THE END!**

Regarding social traffic and trending venues, this report will provide residents and expanding franchisers with useful geographical and social information.