



*Hotel
Recommendations
by Popular Venues*

COURSERA CAPSTONE PROJECT

The problem for travelers:



Travelers spend time and money figuring where to stay on a trip.



They may be disappointed if they arrive at the hotel and discover there is not a lot of variety in meal choices or activities nearby.



Travelers may be able to make more informed decisions if they had information about the hotel (e.g., price, ratings, likes) AND the types of nearby venues.

Project Purpose

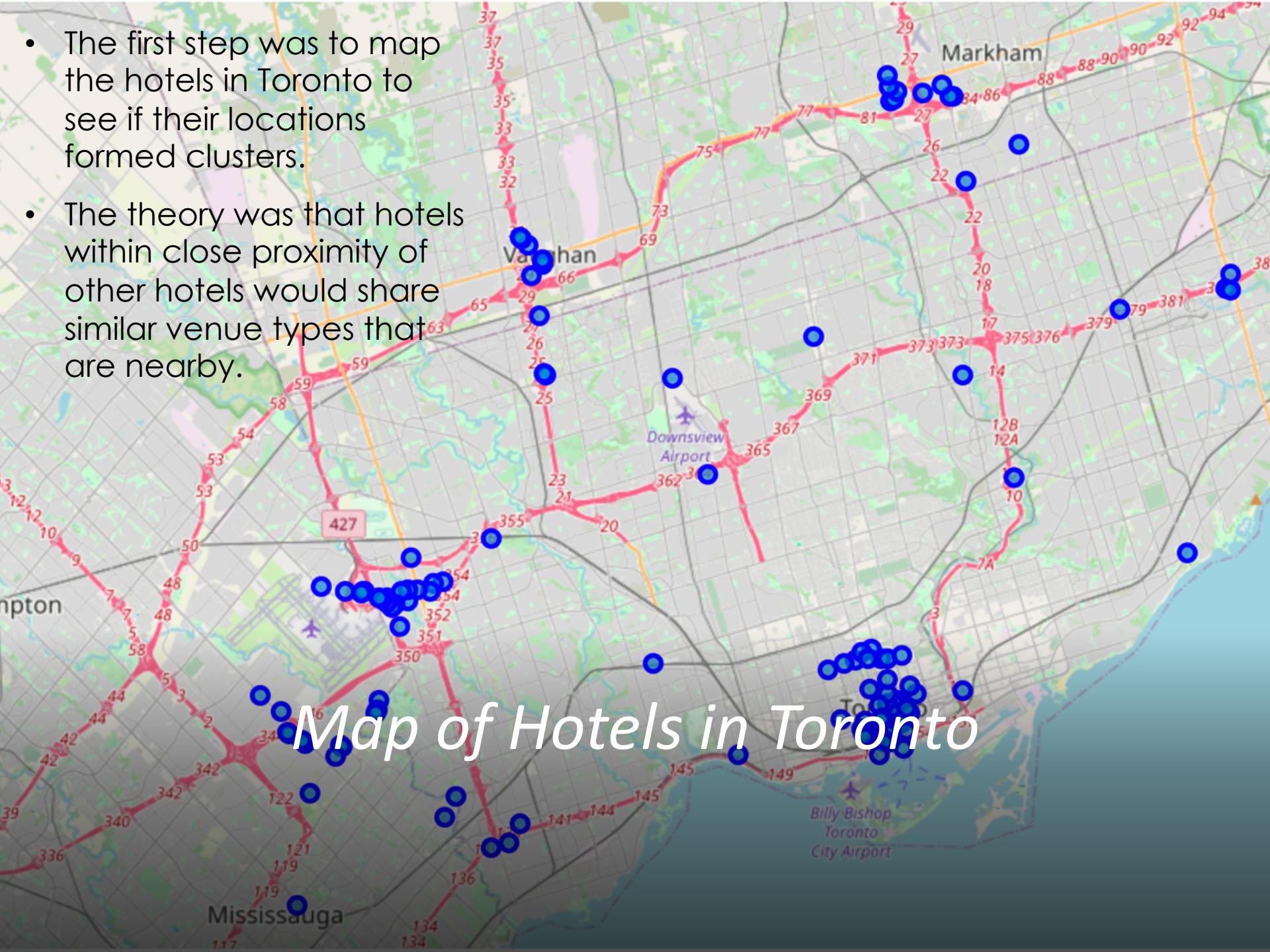
- The purpose of this project is to pilot test the feasibility of using different data sources to identify groups of hotels based on the popular venues located nearby for would-be travelers, the intended audience.
- This project focuses on hotels in Toronto, Canada.

Data Sources and Cleaning

To provide detailed hotel information to help travelers figure out where to stay in Toronto, Canada, the data used for this project are from Hotels.com and Foursquare. After cleaning the data, all information was merged into a master dataset of hotel information.

Hotels.com	Foursquare Hotel Information	Foursquare Nearby Venues
Hotel name	Hotel venue ID	Venue Name
Hotel address	Hotel latitude	Venue Category
Hotel price	Hotel longitude	
	Contact information	
	URL	
	Ratings	
	Likes	

- The first step was to map the hotels in Toronto to see if their locations formed clusters.
- The theory was that hotels within close proximity of other hotels would share similar venue types that are nearby.

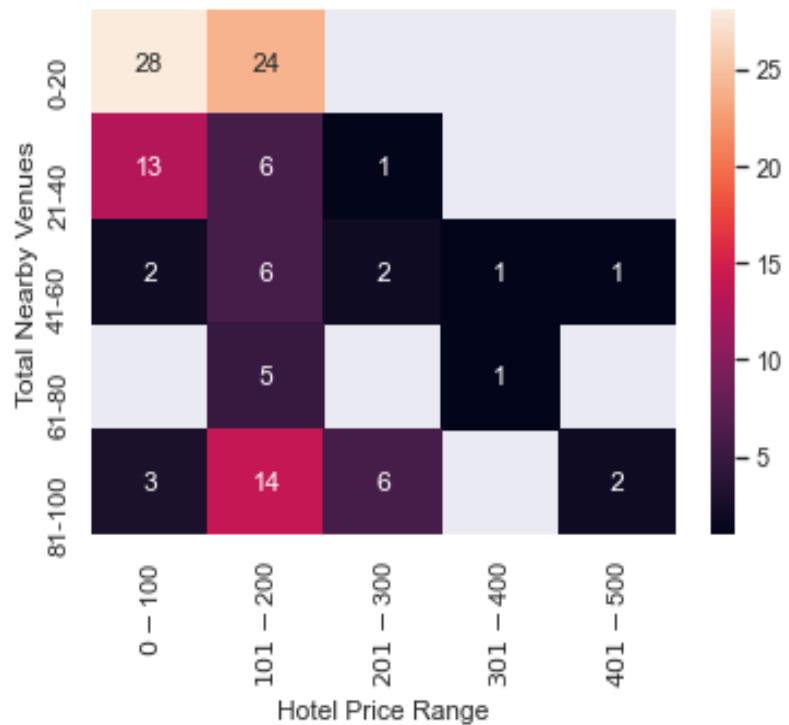


A map of the Greater Toronto Area showing the locations of numerous hotels. The map includes major roads like Highway 401, 403, and 427, and local streets. Hotel locations are marked with blue circles of varying sizes, indicating density. A large cluster of hotels is visible in the downtown core, with smaller clusters in Mississauga, Vaughan, and Markham. The map also shows the locations of Billy Bishop Toronto City Airport and Downsview Airport. The text "Map of Hotels in Toronto" is overlaid in the bottom right corner.

Map of Hotels in Toronto

Relationship Between Hotel Price and Number of Nearby Venues

- Hotels $\leq \$200$ were more likely to have less than 20 nearby venues.
- Hotels $> \$200$ were more likely to have 80-100 nearby venues and were never in areas with less than 20 venues.
- While there was a slight relationship, it was not consistent.
- **This means that travelers cannot use price alone to determine if a hotel will have a variety of venues nearby.**



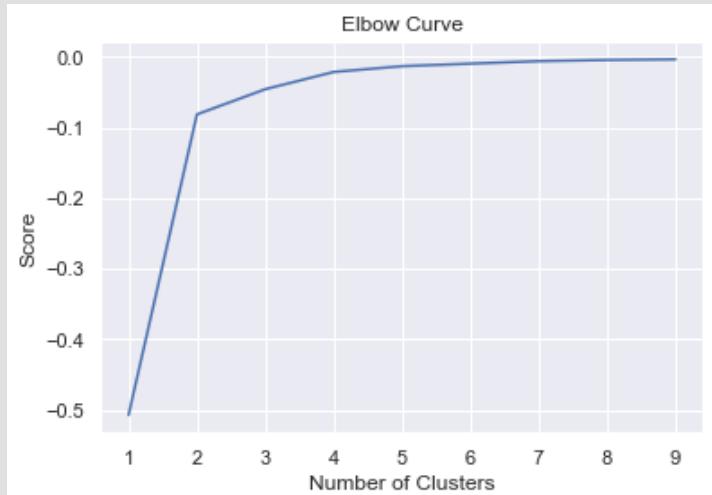
Identifying Likely Number of Hotel Clusters

Created an elbow curve based on a k-means cluster analysis using the hotels' longitude and latitude.

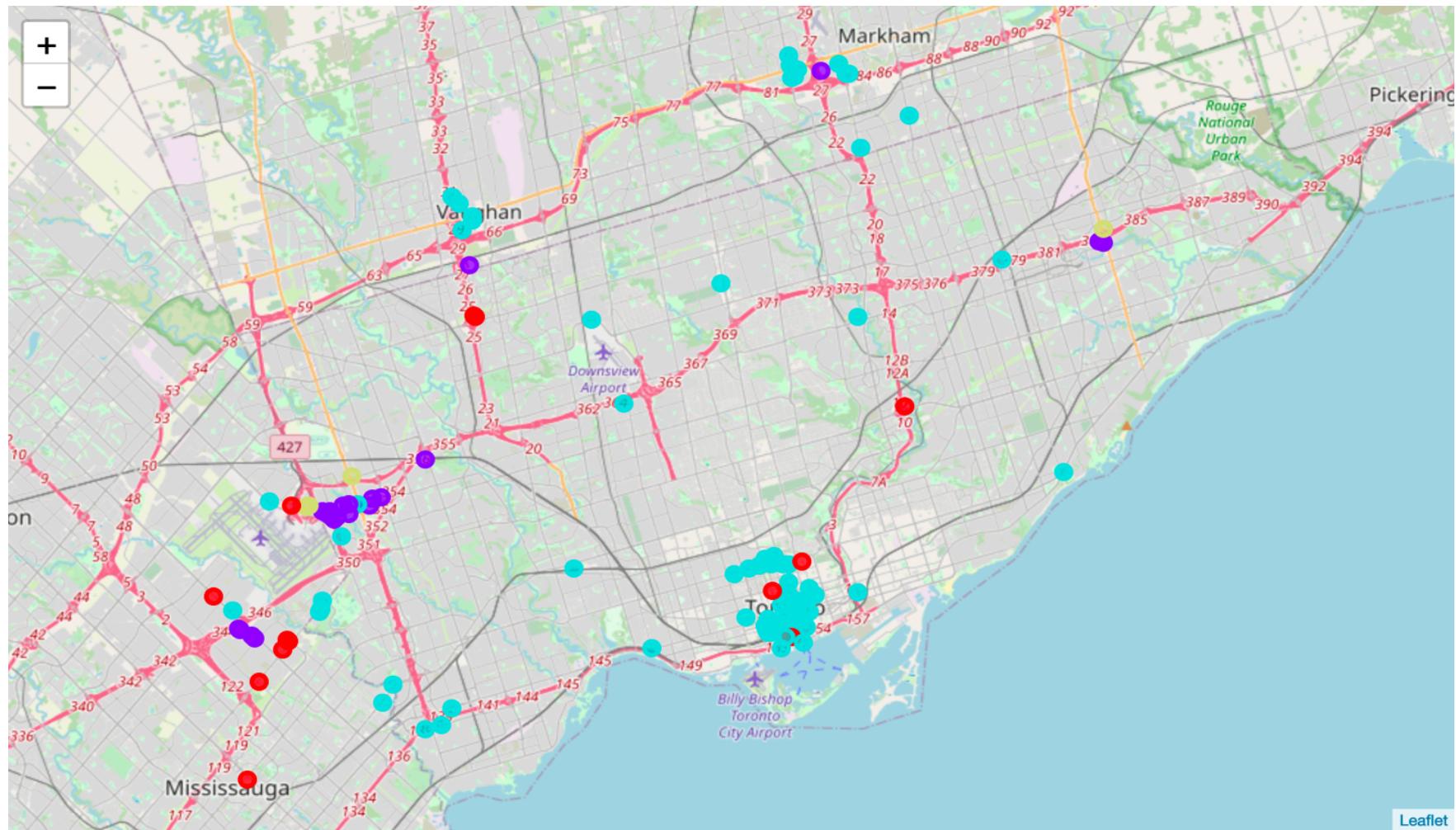
Elbow curve revealed that 4 clusters is likely the most of number of hotel clusters based on location.

Conducted a k-means cluster analysis with 4 clusters of the average number of venue categories for each hotel.

Added the clusters to the data to identify their locations on a map.

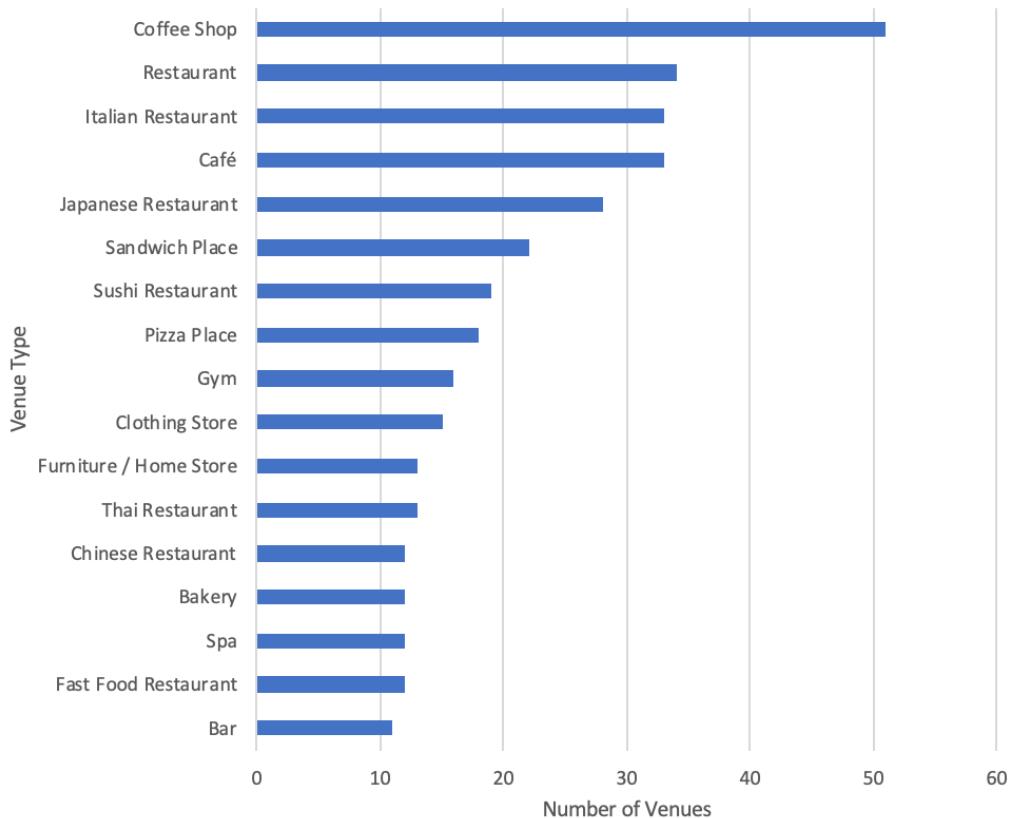


Map of Hotel Clusters in Toronto Based on Most Common Nearby Venue Categories



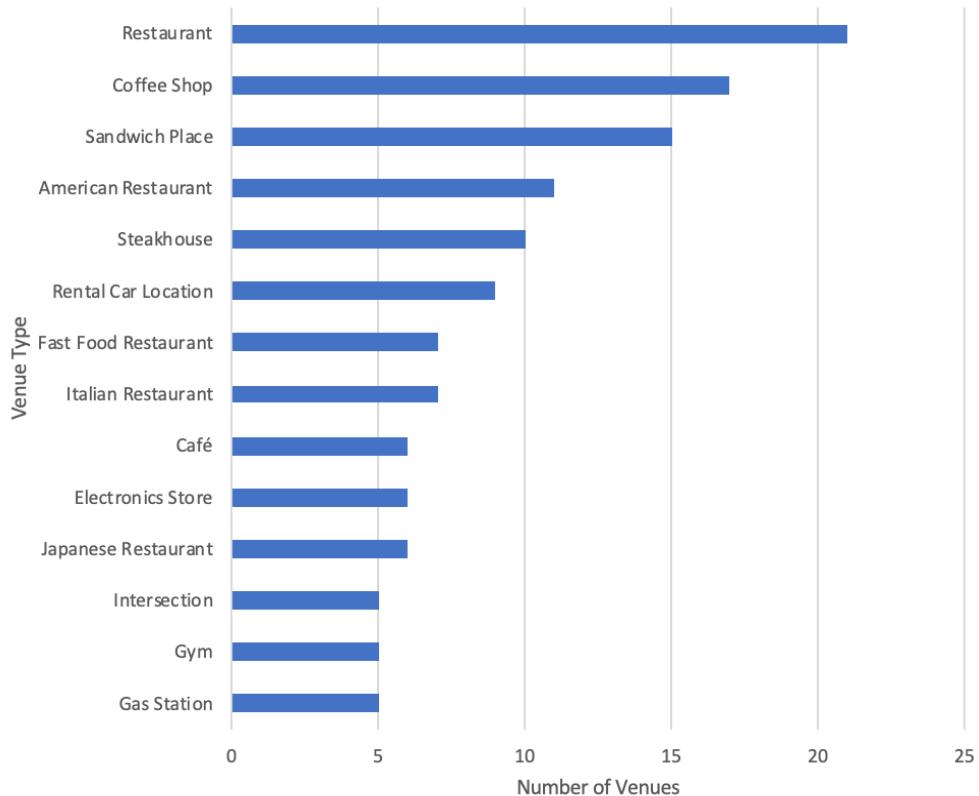
Blue Cluster

- 76 hotels
- Variety of places to eat and things to do
- Located throughout Toronto
- Prices ranged from \$40-\$453
- Average price: \$142.97
- 50% of hotels less than \$125
- Average rating: 7.0
- Average number of likes: 50



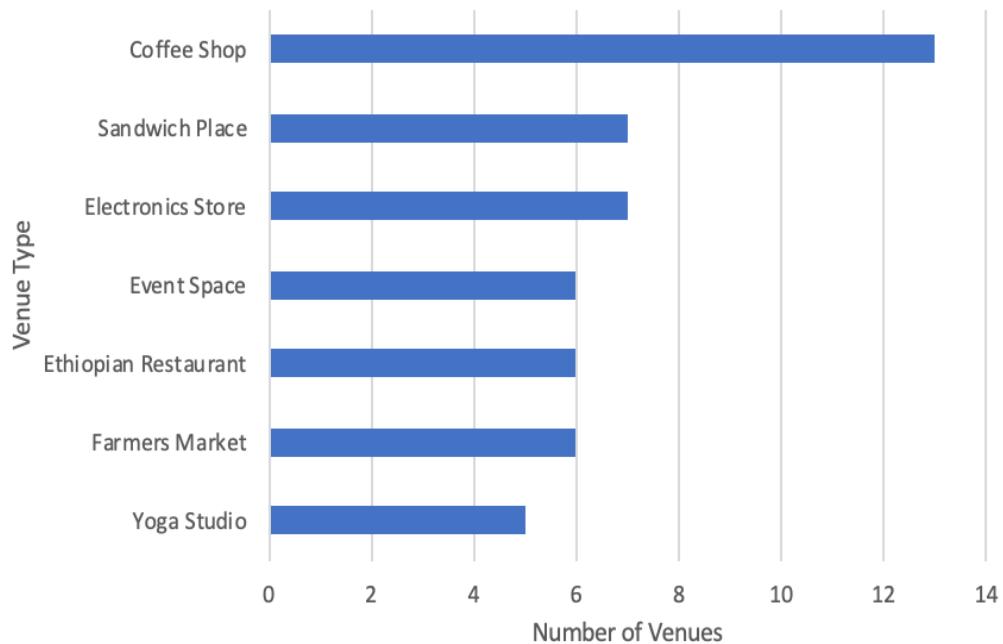
Purple Cluster

- 21 hotels
- Some variety of places to eat and things to do
- Prices ranged from \$66-\$189
- Average price: \$105.19
- 50% of hotels less than \$106
- Average rating: 6.1
- Average number of likes: 16



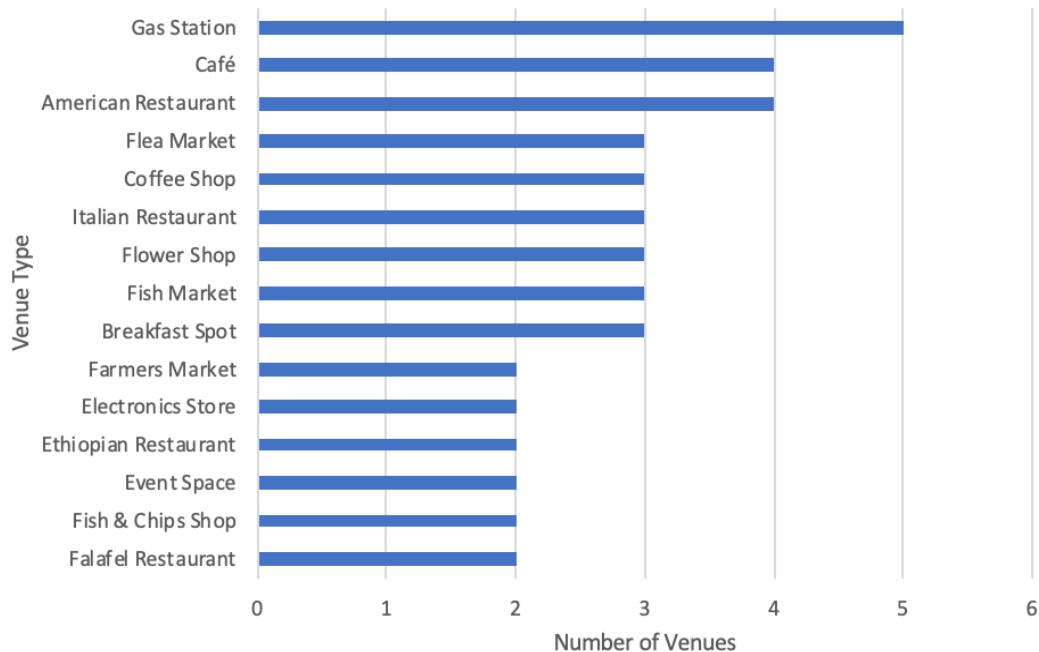
Red Cluster

- 13 hotels
- Little variety
- Prices ranged from \$59-\$348
- Average price: \$123.46
- 50% of hotels less than \$98
- Average rating: 6.7
- Average number of likes: 20



Yellow Cluster

- 5 hotels
- Some variety
- Prices ranged from \$80-\$119
- Average price: \$93.80
- 50% of hotels less than \$87
- Average rating: 6.4
- Average number of likes: 23



Discussion

Hotels in Toronto fell into four different groups.

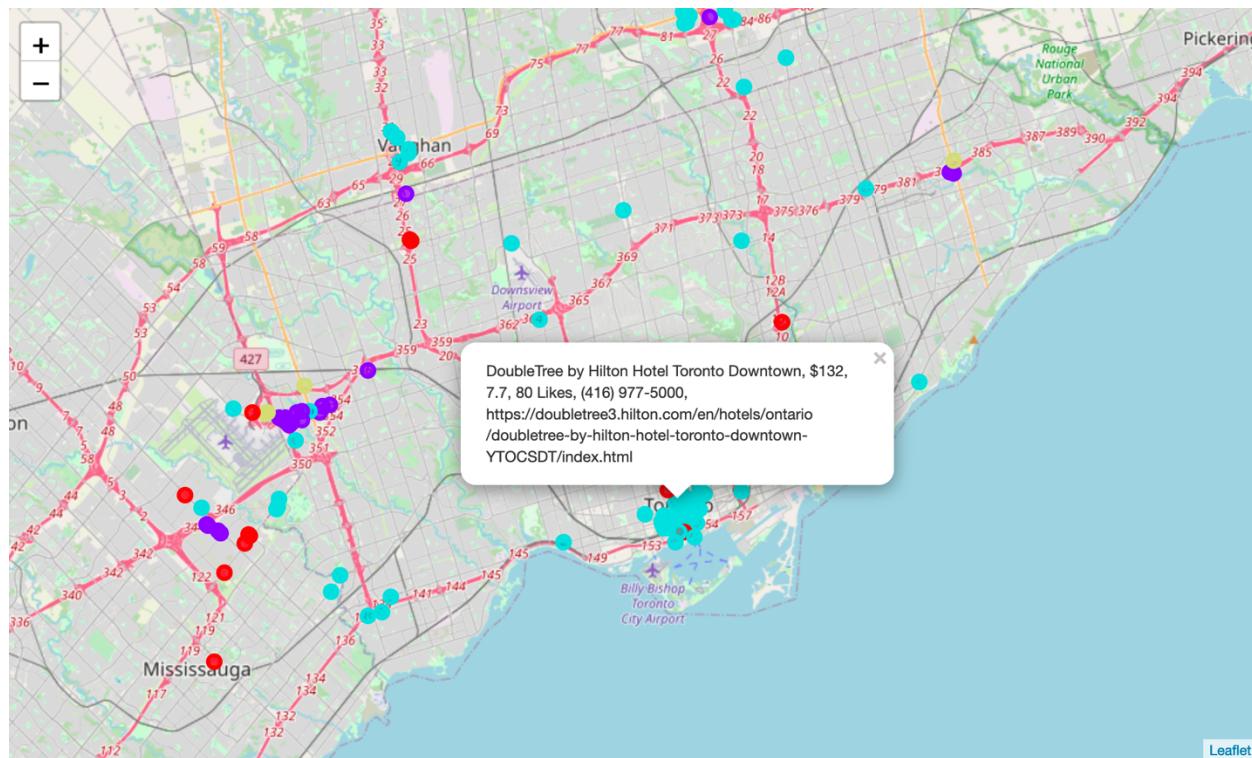
Blue Cluster	Purple Cluster	Red Cluster	Yellow Cluster
<ul style="list-style-type: none">• 66% of hotels in Toronto• Choices for all budgets• Transportation likely not needed	<ul style="list-style-type: none">• 18% of hotels in Toronto• Mostly lower price hotels• May be ideal for short work trips	<ul style="list-style-type: none">• 11% of hotels in Toronto• Choices for all budgets• May need transportation to improve dining and shopping choices	<ul style="list-style-type: none">• 4% of hotels in Toronto• Mostly lower price hotels• Near the airport

Conclusion

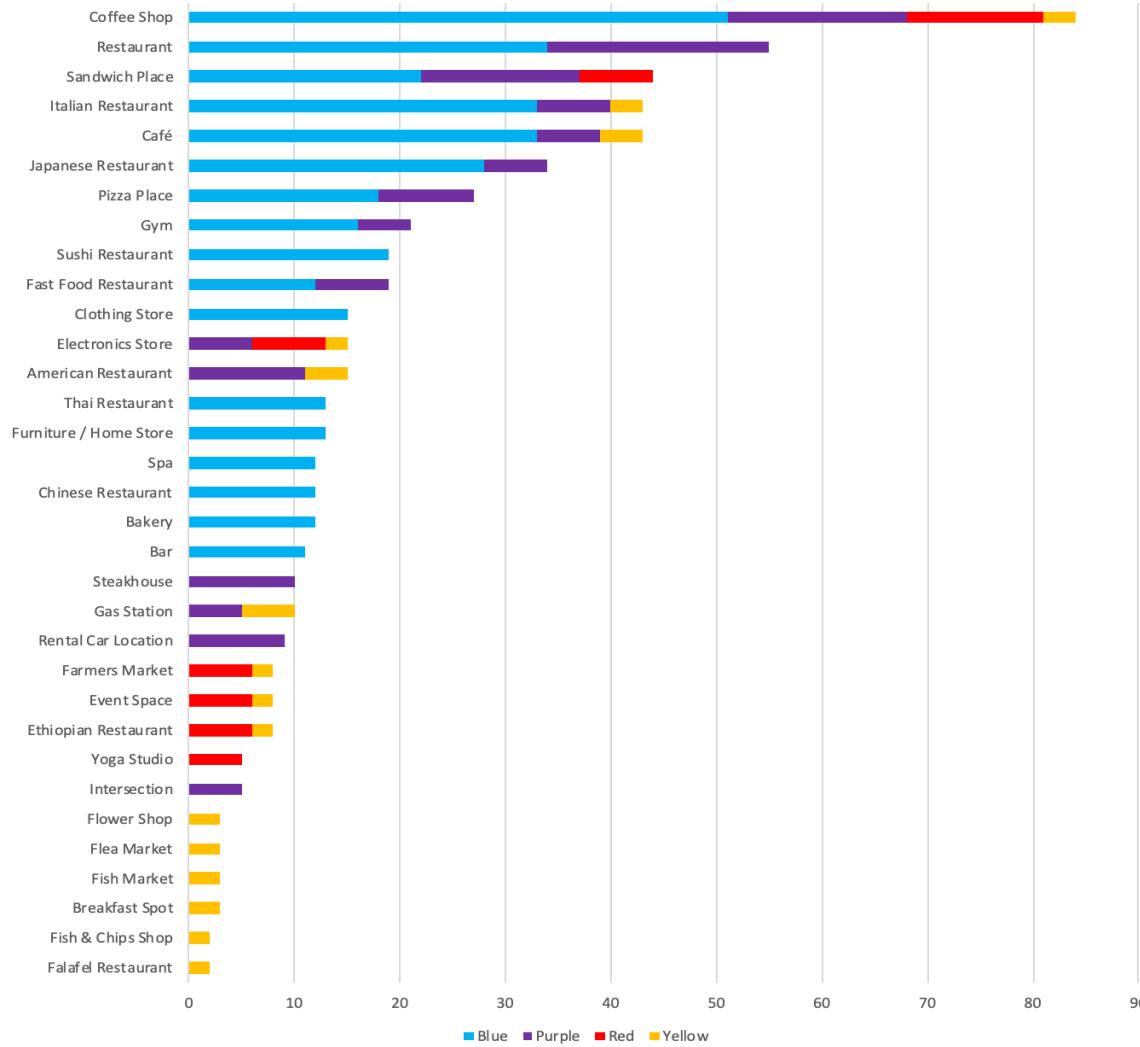
- A traveler coming to Toronto will probably want to focus on the hotels in the blue cluster as their first choice. Hotels in this cluster
 - Are located in various places throughout Toronto;
 - Have a variety of prices to appeal to any budget;
 - Are more highly rated and have more likes, on average, than hotels in the other clusters; and,
 - Have a variety of drinking, dining, shopping, and activities within walking distance.
- The second best cluster of hotels are the red ones. Hotels in this cluster
 - Had the second highest average ratings;
 - Had a variety of prices to appeal to any budget; however,
 - There was little variety in nearby venues, so travelers should know they may need transportation for variety in drinking, dining, shopping, and activities.

Conclusion

- By providing travelers with an interactive map with the different hotel clusters, travelers can easily focus on a particular area or cluster type and use the pop up for additional information.



Conclusion



- In addition, providing travelers with a snapshot of the different venue categories associated with each cluster helps them more easily make informed decisions about where to stay and whether they need additional transportation.
- Providing travelers with information to make better decisions on the front end, may increase their satisfaction with the hotels and nearby venues.