

Predicting Ideal Location for Restaurant

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Being able to understand a market is powerful

- Knowing a market allows investors and business decision makers to accurately assess risk vs reward
- Understanding which areas are already saturated informs stakeholders to stay away since there will be a high barrier to entry against well-established brands in the area
- Helps with targeted marketing demographics

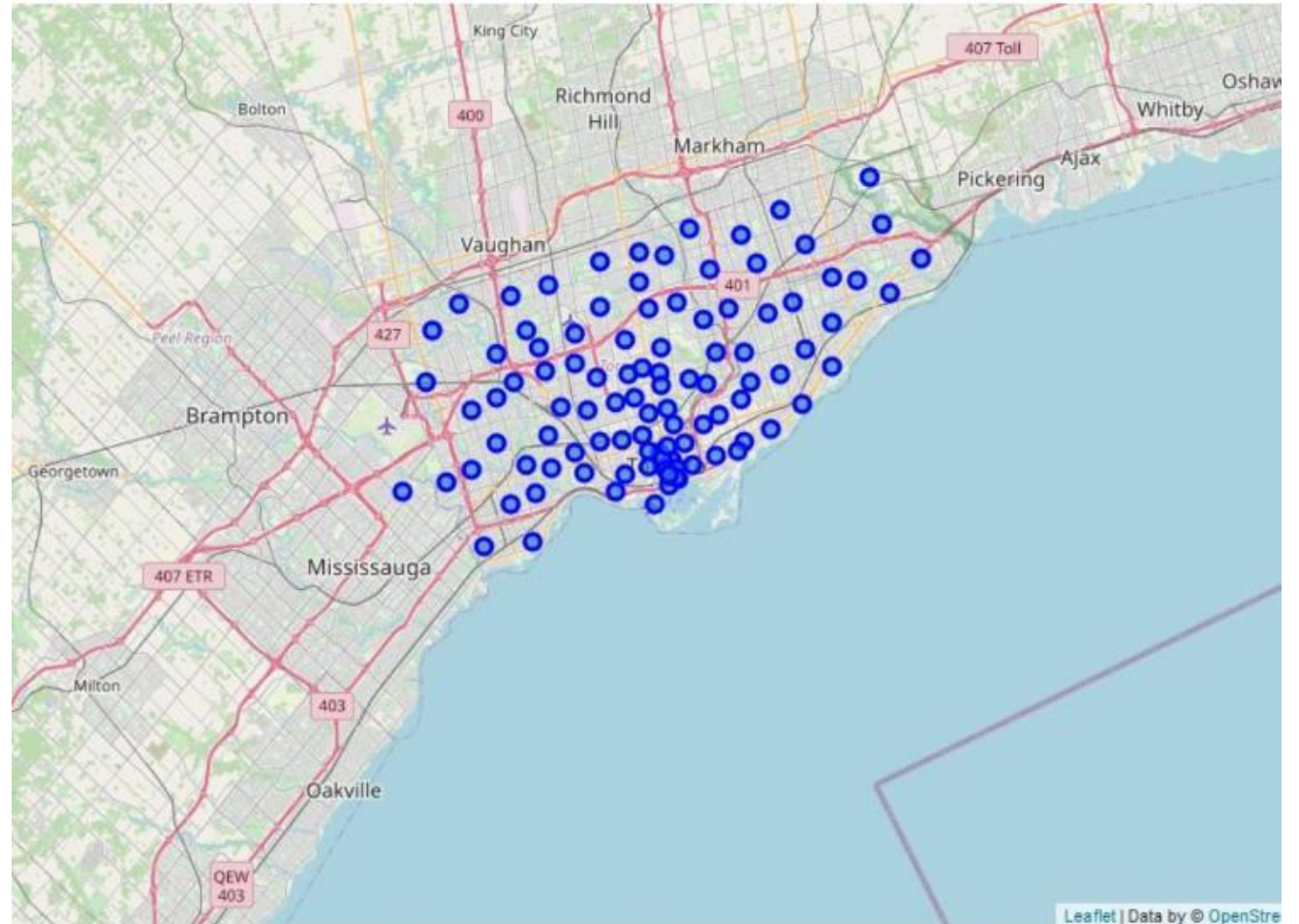
Data Acquisition

- Toronto postal codes, neighborhoods, boroughs were scraped from https://en.wikipedia.org/wiki/List_of_postal_codes_of_Canada:_M
- Toronto postal codes and corresponding latitude/longitude coordinates were provided per the assignment
- Locations of venues were pulled from the Foursquare API
- Map data was pulled from Folium

Methodology

Exploring the Data

- Using a combination of the Foursquare API, Folium, and the table of postal codes, a map of Toronto was able to be rendered
- Each blue mark indicates a borough, which is often made up of several neighborhoods



Current Market Composition

- Compiled a list of all the different types of venues, the locations, and the frequency with which they occupy each region

	Neighborhood	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	Berczy Park	Coffee Shop	Bakery	Cocktail Bar	Seafood Restaurant	Restaurant	Beer Bar	Pharmacy	Farmers Market	Cheese Shop	Beach
1	Brockton, Parkdale Village, Exhibition Place	Café	Breakfast Spot	Coffee Shop	Gym / Fitness Center	Gym	Pet Store	Performing Arts Venue	Nightclub	Music Venue	Italian Restaurant
2	CN Tower, King and Spadina, Railway Lands, Har...	Airport Lounge	Airport Service	Airport Terminal	Boat or Ferry	Harbor / Marina	Rental Car Location	Coffee Shop	Plane	Bar	Sculpture Garden
3	Central Bay Street	Coffee Shop	Sandwich Place	Italian Restaurant	Café	Salad Place	Bubble Tea Shop	Burger Joint	Thai Restaurant	Miscellaneous Shop	Japanese Restaurant

K-Means Clustering

- Clusters were formed based on the frequency of venues and their proximity to each other
- The proximity was measured using standard Euclidean distance

Cluster 2

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In [57]: toronto_merged.loc[toronto_merged['Cluster Labels'] == 1, toronto_merged.columns[[1,2] + list(range(5, toronto_merged.shape[1]))]]
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	Borough	Neighborhood	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	Central Toronto	Forest Hill North & West	1	Park	Trail	Jewelry Store	Sushi Restaurant	Wings Joint	Discount Store	Event Space	Ethiopian Restaurant	Escape Room	Electronics Store
33	Downtown Toronto	Rosedale	1	Park	Playground	Trail	Wings Joint	Dessert Shop	Ethiopian Restaurant	Escape Room	Electronics Store	Eastern European Restaurant	Dumpling Restaurant

Cluster 3

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In [58]: toronto_merged.loc[toronto_merged['Cluster Labels'] == 2, toronto_merged.columns[[1,2] + list(range(5, toronto_merged.shape[1]))]]
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	Borough	Neighborhood	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
3	East Toronto	The Beaches	2	Pizza Place	Asian Restaurant	Health Food Store	Trail	Pub	Donut Shop	Discount Store	Distribution Center	Dog Run	Doner Restaurant

Cluster 4

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In [59]: toronto_merged.loc[toronto_merged['Cluster Labels'] == 3, toronto_merged.columns[[1,2] + list(range(5, toronto_merged.shape[1]))]]
```

	Borough	Neighborhood	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
29	Central Toronto	Moore Park, Summerhill East	3	Gym	Tennis Court	Diner	Falafel Restaurant	Event Space	Ethiopian Restaurant	Escape Room	Electronics Store	Eastern European Restaurant	Dumpling Restaurant

Conclusion

- The best locations to open restaurant are currently in the Eastern Toronto Business district , James Town, or Cabbagetown
- Each area demonstrated a lack of multi-cultural food but also an increased desire to-go style restaurants which many Asian eateries excel at given the nature of how the food is cooked