

Capstone Project

The Battle of the Neighborhoods

The bottom of the slide features several overlapping, wavy horizontal bands in shades of blue, yellow, and light blue, creating a dynamic, flowing effect.

Introduction: Business Problem

- Trying to find an optimal location for a restaurant
- Report will be targeted to stakeholders interested in opening an restaurant in Toronto, Canada
- Based on
 - Population of the neighbourhood
 - Locations that are not already crowded with restaurants
 - As close to city center as possible

Data

- The data sources will be needed to extract/generate the required information
 - centers of candidate areas will be generated algorithmically and approximate addresses of centers of those areas will be obtained using https://en.wikipedia.org/wiki/List_of_postal_codes_of_Canada:_M
 - number of restaurants and their type and location in every neighborhood will be obtained using Foursquare API

Methodology

- Collected required data like location and type of every restaurant within our latitude and longitude.
- Explored the 'restaurant density' across different areas of Toronto - we will use K- mean to identify a few promising areas close to center with low number of restaurants and their type
- Explored the most promising areas and within those create clusters of locations that meet some basic requirements established in discussion with stakeholders: we will take into consideration locations with less restaurants in radius of 500 meters

Analysis

- Data identification, capturing and cleaning
- Combining different data source and sorting neighborhood based on Longitude and latitude
- Explore the Toronto's neighborhoods
- Clustering

Cluster 1

	Borough	Cluster Labels	1st Popular Venues	2nd Popular Venues	3rd Popular Venues	4th Popular Venues	5th Popular Venues	6th Popular Venues	7th Popular Venues	8th Popular Venues	9th Popular Venues	10th Popular Venues
0	Downtown Toronto	0	Coffee Shop	Café	Restaurant	Hotel	Pizza Place	Italian Restaurant	Steakhouse	History Museum	Sporting Goods Shop	Park
1	Downtown Toronto	0	Coffee Shop	Thai Restaurant	Pharmacy	Grocery Store	Food Truck	Moving Target	Beer Store	Electronics Store	Sushi Restaurant	Restaurant
2	Downtown Toronto	0	Coffee Shop	Clothing Store	Cosmetics Shop	Fast Food Restaurant	Café	Middle Eastern Restaurant	Diner	Tea Room	Bookstore	Plaza
4	Downtown Toronto	0	Coffee Shop	Pizza Place	Grocery Store	Café	Beer Store	Bakery	Bank	Restaurant	Library	Breakfast Spot
8	Downtown Toronto	0	Coffee Shop	Café	Restaurant	Italian Restaurant	Grocery Store	Pizza Place	Cocktail Bar	Diner	Cosmetics Shop	Bakery
9	Downtown Toronto	0	Coffee Shop	Restaurant	Hotel	Café	Italian Restaurant	Gastropub	American Restaurant	Gym	Japanese Restaurant	Deli / Bodega
13	Downtown Toronto	0	Coffee Shop	Café	Restaurant	Hotel	Pizza Place	Italian Restaurant	Steakhouse	History Museum	Sporting Goods Shop	Park
14	Downtown Toronto	0	Playground	Farm	Scenic Lookout	American Restaurant	Beer Garden	Beach	Egyptian Restaurant	Electronics Store	Ethiopian Restaurant	Event Space
16	West Toronto	0	Bar	Coffee Shop	Café	Restaurant	Cocktail Bar	Bakery	Thai Restaurant	Portuguese Restaurant	French Restaurant	Korean Restaurant
17	West Toronto	0	Clothing Store	Coffee Shop	Cosmetics Shop	Restaurant	Plaza	Tea Room	Fast Food Restaurant	Lingerie Store	Pizza Place	Theater
19	East Toronto	0	Vietnamese Restaurant	Bakery	Chinese Restaurant	Bar	Light Rail Station	Baseball Field	Fast Food Restaurant	Asian Restaurant	Gym / Fitness Center	Trail

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Cluster 2

	Borough	Cluster Labels	1st Popular Venues	2nd Popular Venues	3rd Popular Venues	4th Popular Venues	5th Popular Venues	6th Popular Venues	7th Popular Venues	8th Popular Venues	9th Popular Venues	10th Popular Venues
3	Downtown Toronto	1	Clothing Store	Coffee Shop	Cosmetics Shop	Fast Food Restaurant	Restaurant	Hotel	Lingerie Store	Middle Eastern Restaurant	Tea Room	Theater
6	Downtown Toronto	1	Coffee Shop	Café	Restaurant	Hotel	Bakery	Beer Bar	Japanese Restaurant	Gym	Gastropub	Seafood Restaurant
7	Downtown Toronto	1	Korean Restaurant	Coffee Shop	Indian Restaurant	Cocktail Bar	Café	Japanese Restaurant	Karaoke Bar	Dessert Shop	Sandwich Place	Grocery Store
15	Downtown Toronto	1	Coffee Shop	Café	Deli / Bodega	Restaurant	Hotel	Bakery	Italian Restaurant	Breakfast Spot	Steakhouse	Gym
25	East Toronto	1	Beach	Bar	Breakfast Spot	Japanese Restaurant	Tea Room	Coffee Shop	Pub	Thai Restaurant	Park	Salon / Barbershop
26	East Toronto	1	Indian Restaurant	Café	Halal Restaurant	Grocery Store	Snack Place	Pakistani Restaurant	Sandwich Place	Restaurant	Egyptian Restaurant	Discount Store
27	Downtown Toronto	1	Coffee Shop	Hotel	Café	Restaurant	American Restaurant	Steakhouse	Japanese Restaurant	Italian Restaurant	Bakery	Gastropub
31	Central Toronto	1	Playground	Bank	Park	Mediterranean Restaurant	Yoga Studio	Farm	Electronics Store	Ethiopian Restaurant	Event Space	Falafel Restaurant
33	Central Toronto	1	Pizza Place	Coffee Shop	Park	Thai Restaurant	Bistro	Grocery Store	Ice Cream Shop	Indian Restaurant	Falafel Restaurant	Fried Chicken Joint
34	Central Toronto	1	Café	Boutique	Coffee Shop	Restaurant	Italian Restaurant	French Restaurant	Sushi Restaurant	Spa	Hotel	Women's Store
38	Downtown Toronto	1	Café	Restaurant	Coffee Shop	Japanese Restaurant	Bookstore	Bakery	Museum	Bar	Beer Store	French Restaurant
53	Downtown Toronto	1	Coffee Shop	Café	Restaurant	Hotel	Pizza Place	Italian Restaurant	Steakhouse	History Museum	Sporting Goods Shop	Park
59	Downtown Toronto	1	Coffee Shop	Café	Hotel	Restaurant	Steakhouse	Burger Joint	Bar	Seafood Restaurant	Asian Restaurant	Gastropub

Cluster 3

Out[73]:

	Borough	Cluster Labels	1st Popular Venues	2nd Popular Venues	3rd Popular Venues	4th Popular Venues	5th Popular Venues	6th Popular Venues	7th Popular Venues	8th Popular Venues	9th Popular Venues	10th Popular Venues
49	Central Toronto	2	Coffee Shop	Sandwich Place	History Museum	Pizza Place	Café	Jewish Restaurant	Cosmetics Shop	Park	Pub	Cheese Shop

Cluster 4

Cluster 4

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	Borough	Cluster Labels	1st Popular Venues	2nd Popular Venues	3rd Popular Venues	4th Popular Venues	5th Popular Venues	6th Popular Venues	7th Popular Venues	8th Popular Venues	9th Popular Venues	10th Popular Venues
5	East Toronto	3	Beach	Bar	Breakfast Spot	Japanese Restaurant	Tea Room	Coffee Shop	Pub	Thai Restaurant	Park	Salon / Barbershop
10	Downtown Toronto	3	Coffee Shop	Hotel	Restaurant	Diner	Gastropub	Cosmetics Shop	Cocktail Bar	Clothing Store	Italian Restaurant	Pizza Place
11	West Toronto	3	Café	Restaurant	Pizza Place	Bar	Park	Bus Line	Coffee Shop	Falafel Restaurant	Electronics Store	Ethiopian Restaurant
12	West Toronto	3	Bar	Bakery	Coffee Shop	Café	Cocktail Bar	Sandwich Place	Clothing Store	Beer Bar	Beer Store	Mexican Restaurant
30	Central Toronto	3	Sandwich Place	Dessert Shop	Coffee Shop	Sushi Restaurant	Pizza Place	Thai Restaurant	Café	Italian Restaurant	Fried Chicken Joint	Seafood Restaurant
35	West Toronto	3	Tibetan Restaurant	Bar	Café	Pharmacy	Diner	Restaurant	Indian Restaurant	Liquor Store	North Indian Restaurant	Donut Shop
36	West Toronto	3	Bookstore	Gourmet Shop	Breakfast Spot	Restaurant	Coffee Shop	Gift Shop	Café	Gastropub	Bank	Movie Theater
39	Downtown Toronto	3	Café	Bookstore	Park	Japanese Restaurant	Yoga Studio	College Gym	Museum	French Restaurant	Noodle House	Chinese Restaurant
42	Central Toronto	3	Playground	Gym	Tennis Court	Park	Yoga Studio	Event Space	Eastern European Restaurant	Egyptian Restaurant	Electronics Store	Ethiopian Restaurant
44	Downtown Toronto	3	Café	Vegetarian / Vegan Restaurant	Chinese Restaurant	Bar	Vietnamese Restaurant	Dumpling Restaurant	Mexican Restaurant	Coffee Shop	Bakery	Dessert Shop
47	Central Toronto	3	Coffee Shop	Italian Restaurant	Café	Sushi Restaurant	Pub	Sandwich Place	Bagel Shop	Restaurant	Gym	Grocery Store
48	Central Toronto	3	Mexican Restaurant	French Restaurant	Italian Restaurant	Park	Pizza Place	Mediterranean Restaurant	Electronics Store	BBQ Joint	Liquor Store	Coffee Shop
50	Central Toronto	3	Italian Restaurant	Café	Sushi Restaurant	Pizza Place	Coffee Shop	Spa	Bistro	Bar	Juice Bar	Furniture / Home Store
51	Downtown Toronto	3	Hotel	Coffee Shop	Pizza Place	Italian Restaurant	Aquarium	Gym	Scenic Lookout	Baseball Stadium	Bar	Concert Hall
52	Downtown Toronto	3	Coffee Shop	Coffee Shop	Pizza Place	Japanese Restaurant	Pub	Gastropub	Ramen	Japanese Restaurant	Sculpture	Event Space

Cluster 5

	Borough	Cluster Labels	1st Popular Venues	2nd Popular Venues	3rd Popular Venues	4th Popular Venues	5th Popular Venues	6th Popular Venues	7th Popular Venues	8th Popular Venues	9th Popular Venues	10th Popular Venues
18	East Toronto	4	Grocery Store	Pharmacy	Coffee Shop	Bus Line	Doctor's Office	Optical Shop	Sandwich Place	Caribbean Restaurant	Café	Skating Rink
32	West Toronto	4	Baseball Field	Dog Run	Zoo	Garden	Other Great Outdoors	Park	Scenic Lookout	Skating Rink	Café	Pool
40	West Toronto	4	Pizza Place	Rental Car Location	Coffee Shop	Pharmacy	Grocery Store	Café	Fried Chicken Joint	Sandwich Place	Bar	Thai Restaurant

Results

Our analysis shows that although there is a great number of restaurants in Toronto, there are pockets of low restaurant density fairly close to city center. We have 4 boroughs and 74 neighborhoods inside geographical coordinate of 43.653963, -79.387207

Conclusion

The decision on optimal restaurant location will be made by stakeholders based on specific characteristics of neighborhoods and locations in every recommended zone, taking into consideration additional factors like attractiveness of each location (proximity to park or water), levels of noise / proximity to major roads, real estate availability, prices, social and economic dynamics of every neighborhood etc.