

Subha Halder - 31st Oct, 2020

Searching for Best Neighbourhood to Open Steakhouse in Toronto, Ontario

Segment and Cluster Neighborhoods in
Toronto, Ontario to find best neighbourhood
to open steakhouse

Introduction

Find best neighbourhood in Toronto to open steakhouse:

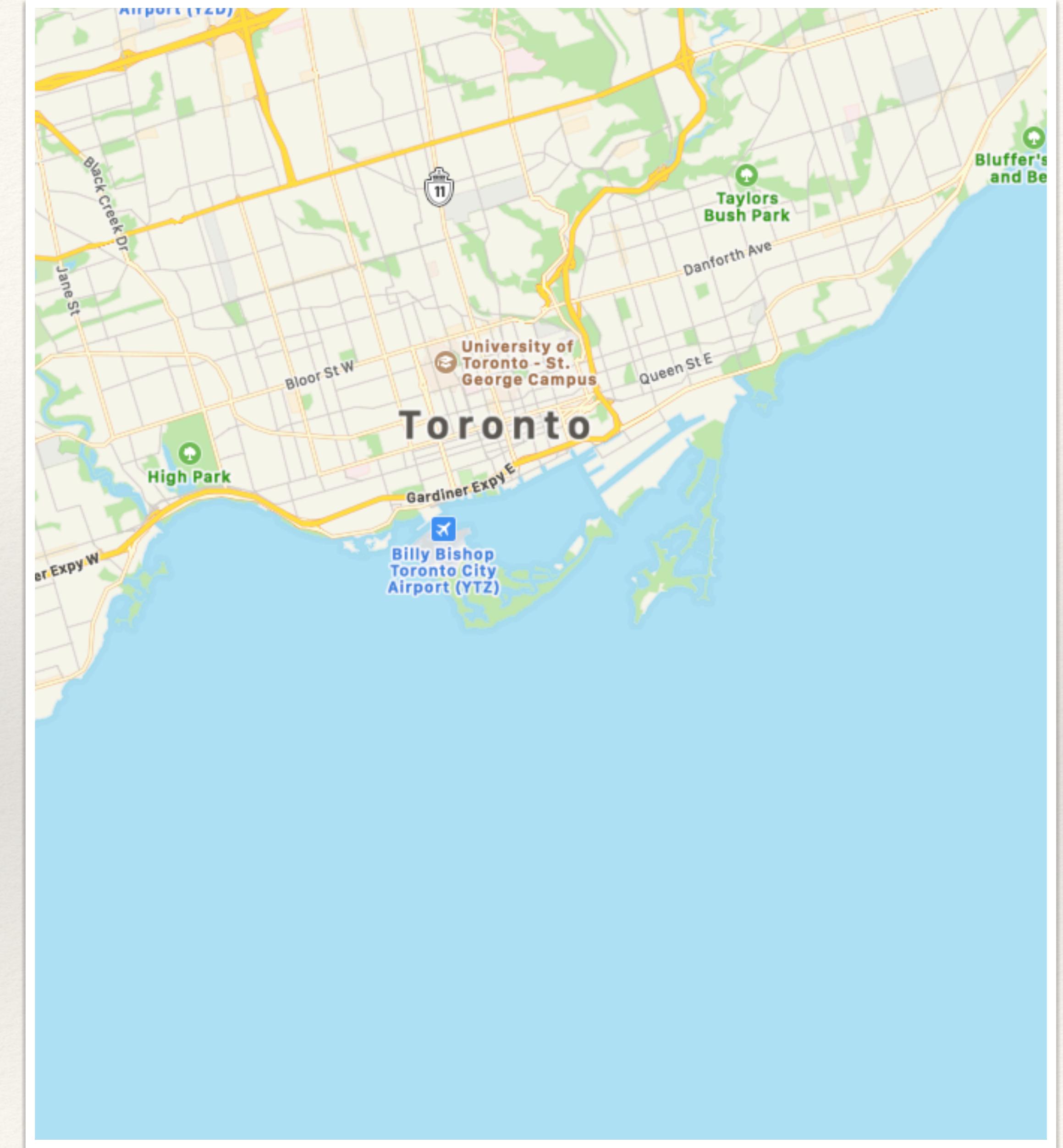
- With high population density
- With high median household income
- Highest number of popular venues
- Lowest number of steakhouse

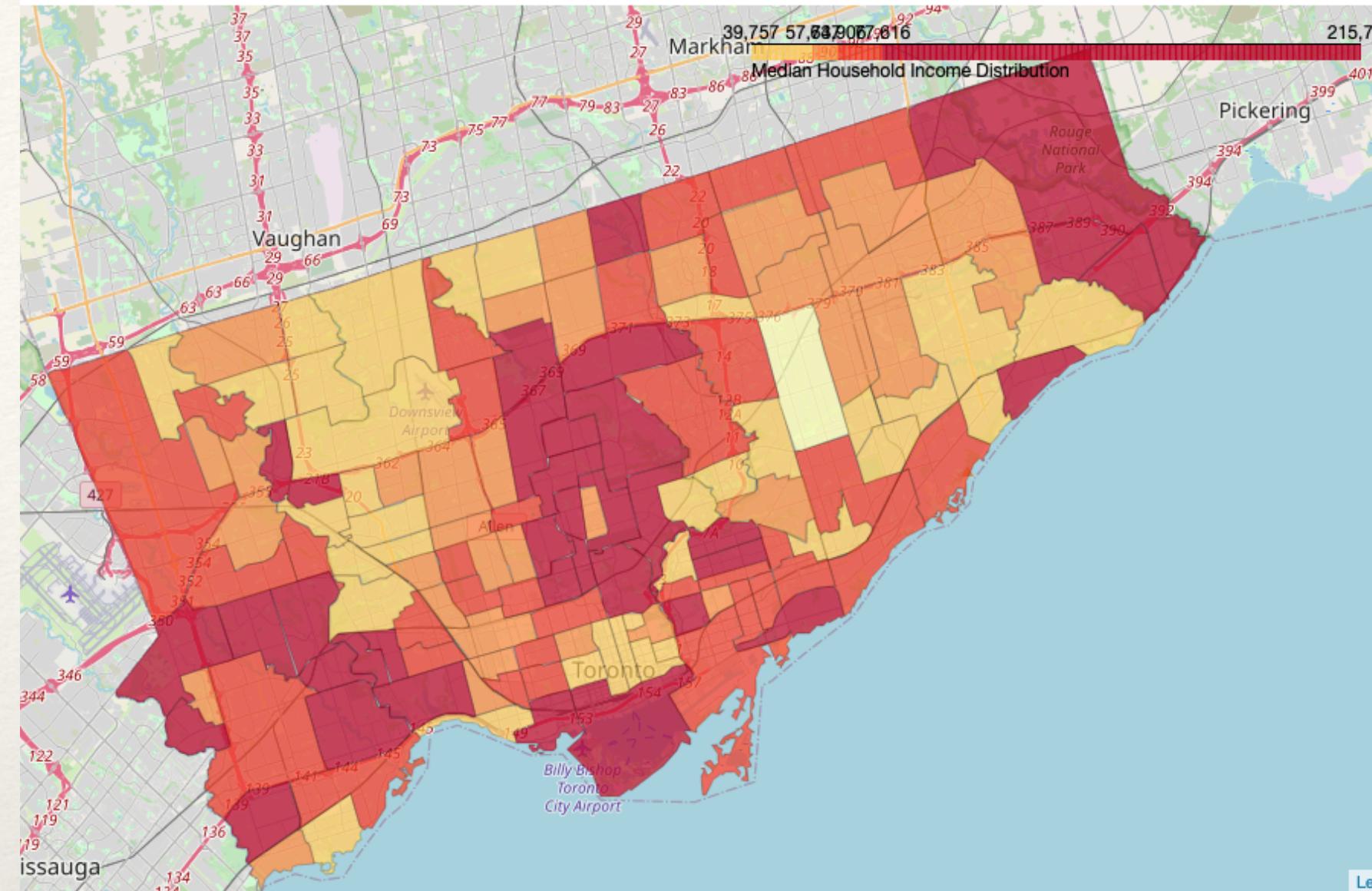
Data Acquisition

Census Chart for neighbourhood in Toronto

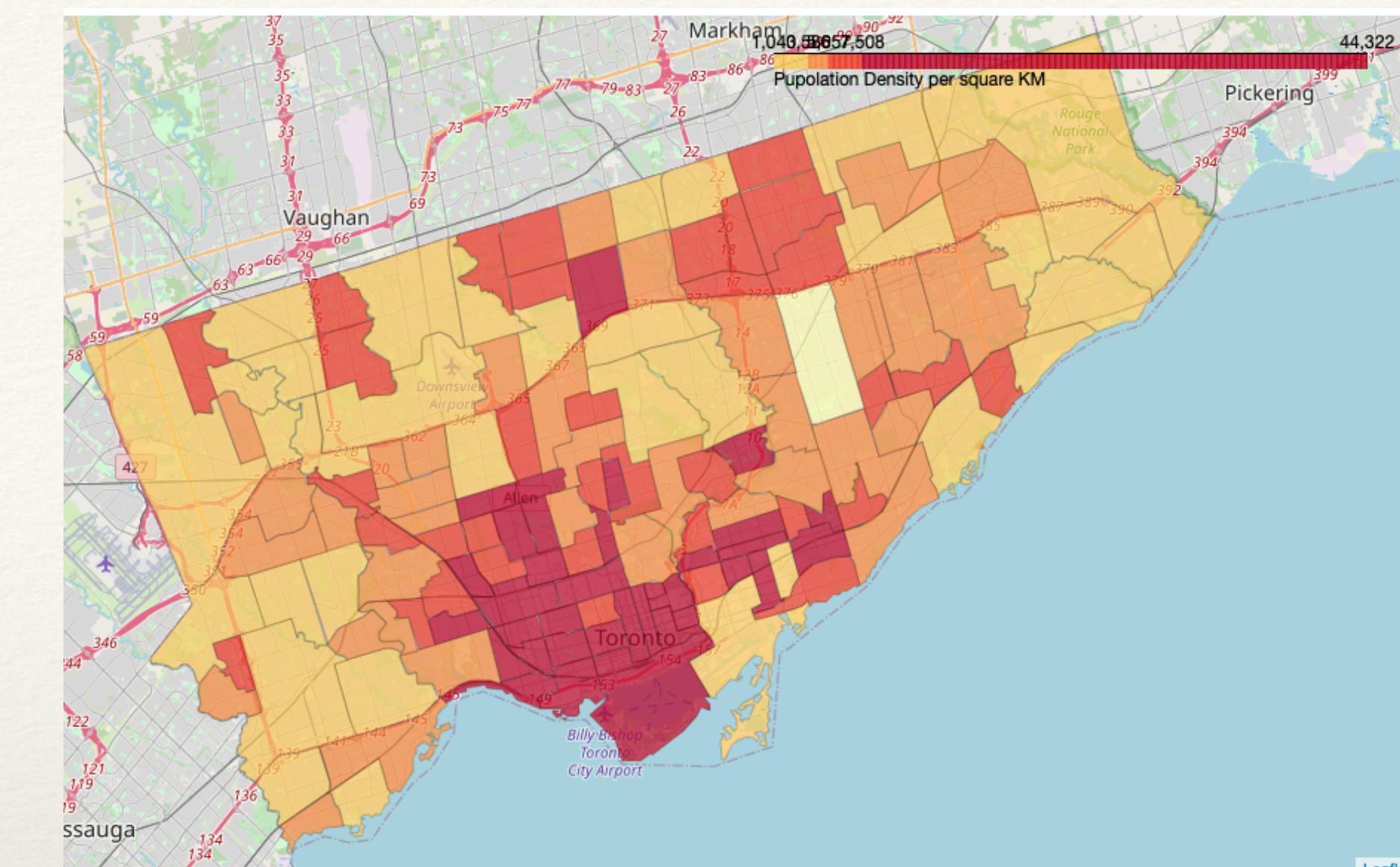
Location Data for Neighbourhood

Age Demographic

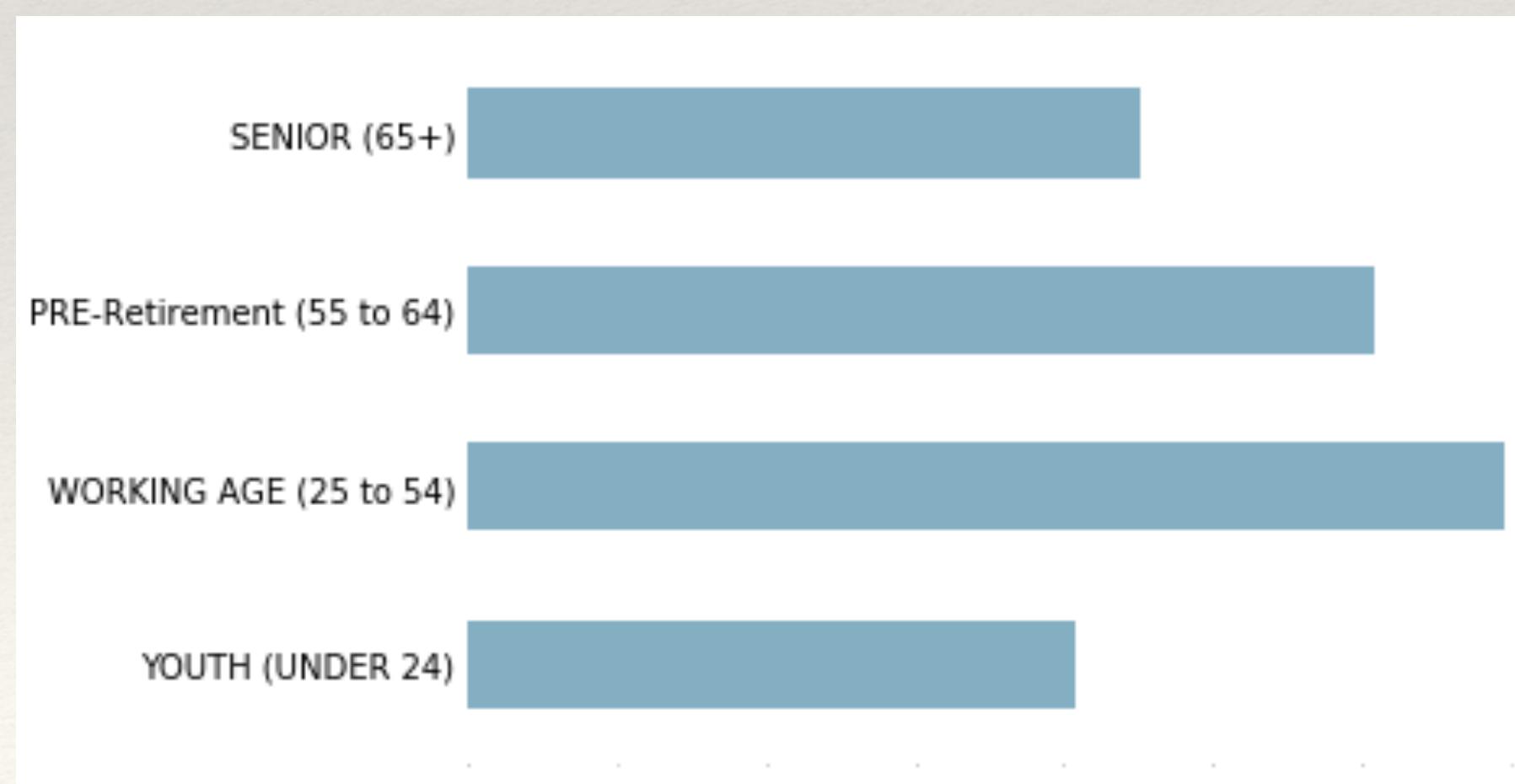




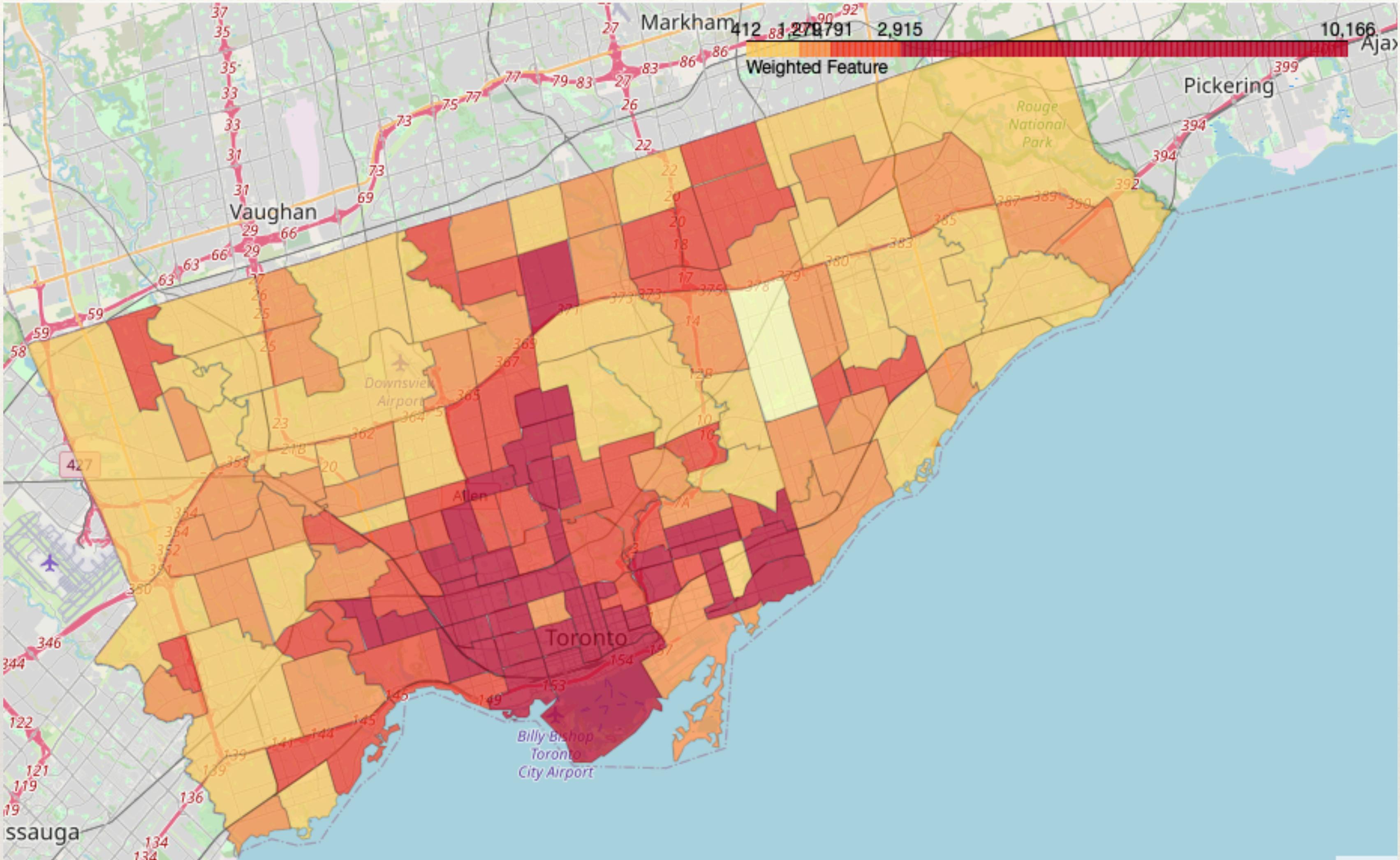
Median Household Income Distribution



Density Distribution



Age Demographic for Annual Spending Frequency

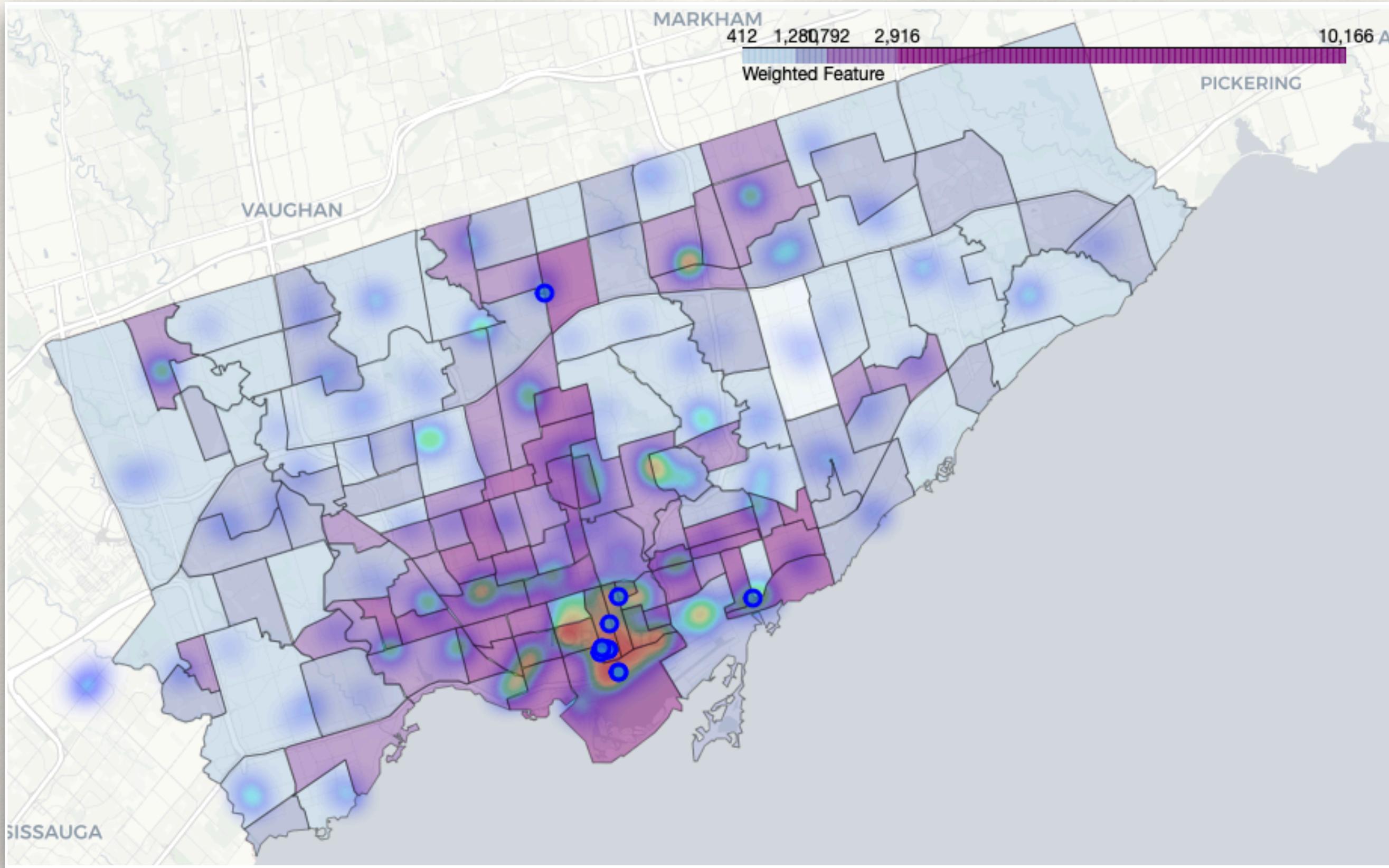


$$WeightedFeature = [\sum (PercentageAgeGroup) \times (SpendingFrequency)] \times Density \times Income$$

Methodology

Analyse Toronto Neighbourhoods

- Determine neighbourhood with highest concentration of popular venues
- Analyse the neighbourhood
- Cluster the neighbourhoods in 5 groups by venues
- Analyse with neighbourhood excluding restaurants from venues



HeatMap of venues excluding restaurants with Steakhouses Marked

Downtown has highest concentration of popular venues.

	Borough	Neighborhood_Count	Venue Count
0	North York	24	239
1	Downtown Toronto	19	1248
2	Scarborough	17	89
3	Etobicoke	12	74
4	Central Toronto	9	104
5	West Toronto	6	153
6	East Toronto	5	119
7	East York	5	77
8	York	5	336
9	Mississauga	1	13

Analysis of Each Borough

Downtown has highest concentration of popular venues.

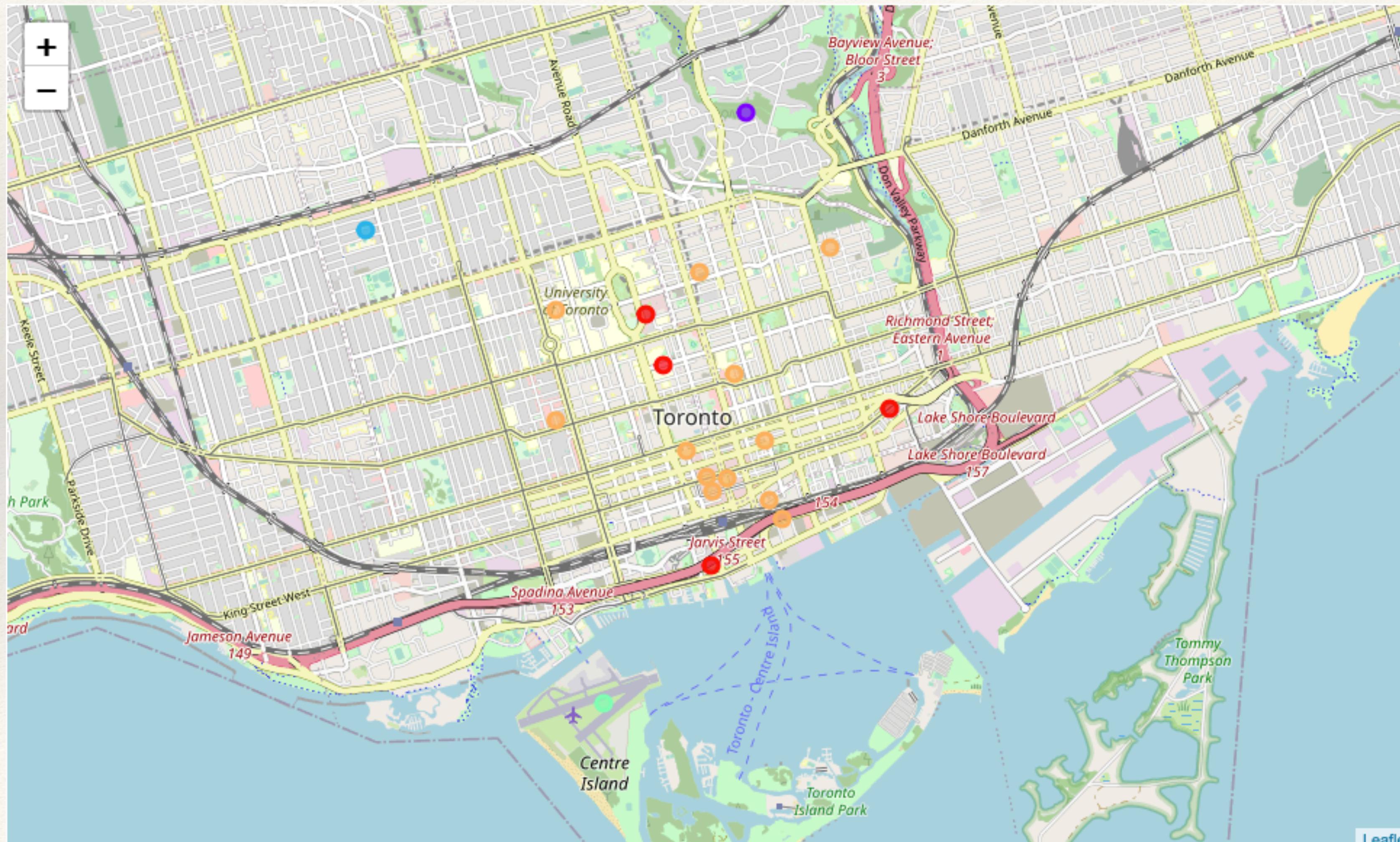
Analysis of Downtown Toronto

Analysing Neighbourhoods with Venues including Restaurants

- ❖ Select data-frame with venue and neighbourhood data
- ❖ Create One-hot Chart
- ❖ Run KMean Cluster (5 clusters)

Analysis of Downtown Toronto

Analysing Neighbourhoods with Venues including Restaurants



Analysis of Downtown Toronto

Analysing Neighbourhoods with Venues including Restaurants

Green 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	
9	Downtown Toronto	4	Clothing Store	Coffee Shop	Café	Bubble Tea Shop	Cosmetics Shop	Japanese Restaurant	Ramen Restaurant	Hotel	Italian Restaurant	Lingerie Store
15	Downtown Toronto	4	Coffee Shop	Café	Cocktail Bar	Restaurant	Gastropub	American Restaurant	Beer Bar	Gym	Seafood Restaurant	Farmers Market
20	Downtown Toronto	4	Coffee Shop	Seafood Restaurant	Cocktail Bar	Bakery	Cheese Shop	Beer Bar	Restaurant	Farmers Market	Hotel	Italian Restaurant
30	Downtown Toronto	4	Coffee Shop	Café	Gym	Restaurant	Hotel	Bar	Thai Restaurant	Clothing Store	Sushi Restaurant	Juice Bar
42	Downtown Toronto	4	Coffee Shop	Hotel	Restaurant	Café	Salad Place	Seafood Restaurant	American Restaurant	Japanese Restaurant	Italian Restaurant	Bar

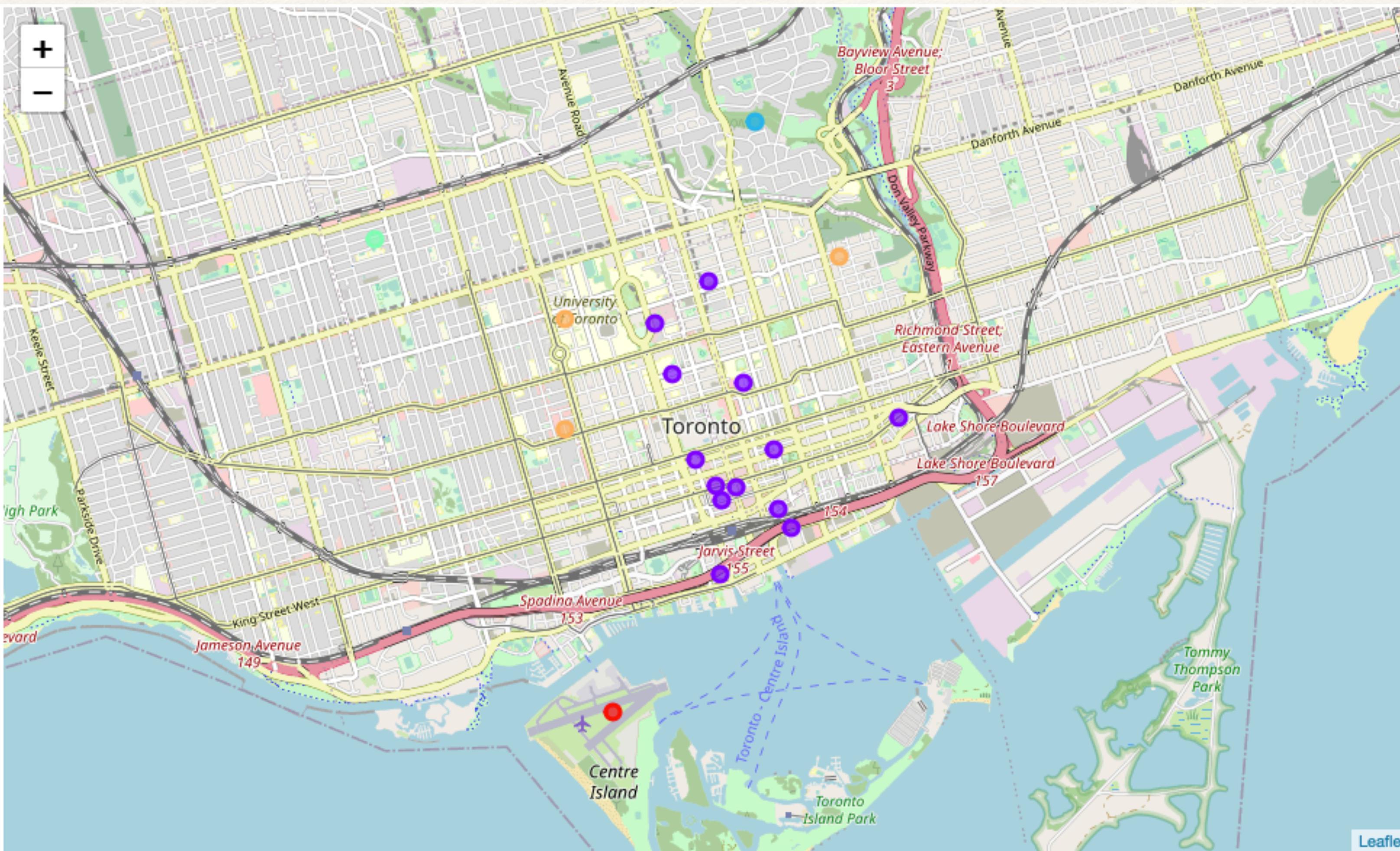
Analysis of Downtown Toronto

Analysing Neighbourhoods with Venues excluding Restaurants

- ❖ Select data-frame with venue and neighbourhood data
- ❖ Exclude Restaurants
- ❖ Create One-hot Chart
- ❖ Run KMean Cluster (5 clusters)

Analysis of Downtown Toronto

Analysing Neighbourhoods with Venues excluding Restaurants



Analysis of Downtown Toronto

Analysing Neighbourhoods with Venues excluding Restaurants

Cluster: 1 (Airport) in Red

Neighbourhood	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
CN Tower, King and Spadina, Railway Lands, Har...	0	Airport Lounge	Airport Service	Sculpture Garden	Harbor / Marina	Plane	Rental Car Location	Boutique	Boat or Ferry	Bar	Coffee Shop

Cluster: 3 (Parks) in Yellow

Neighbourhood	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
Rosedale	2	Park	Trail	Playground	College Rec Center	Deli / Bodega	Dance Studio	Cupcake Shop	Creperie	Cosmetics Shop	Convenience Store

Analysis of Downtown Toronto

Analysing Neighbourhoods with Venues excluding Restaurants

Cluster: 2 (Commerce) in Blue

Neighbourhood	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
Regent Park, Harbourfront	1	Coffee Shop	Park	Pub	Bakery	Café	Theater	Breakfast Spot	Performing Arts Venue	Brewery	Event Space
Queen's Park, Ontario Provincial Government	1	Coffee Shop	Yoga Studio	College Auditorium	Bar	Sandwich Place	Beer Bar	Café	Music Venue	College Cafeteria	Smoothie Shop
Garden District, Ryerson	1	Clothing Store	Coffee Shop	Café	Bubble Tea Shop	Cosmetics Shop	Hotel	Theater	Bookstore	Lingerie Store	Pizza Place
St. James Town	1	Coffee Shop	Café	Cocktail Bar	Beer Bar	Gastropub	Lingerie Store	Hotel	Department Store	Clothing Store	Farmers Market
Berczy Park	1	Coffee Shop	Bakery	Beer Bar	Cocktail Bar	Cheese Shop	Farmers Market	Shopping Mall	Hotel	Basketball Stadium	Beach
Central Bay Street	1	Coffee Shop	Café	Sandwich Place	Salad Place	Bubble Tea Shop	Burger Joint	Department Store	Comic Shop	Bookstore	Poke Place
Richmond, Adelaide, King	1	Coffee Shop	Café	Gym	Bar	Hotel	Clothing Store	Salad Place	Deli / Bodega	Pizza Place	Office

Analysis of Downtown Toronto

Analysing Neighbourhoods with Venues excluding Restaurants

Cluster: 2 (Commerce) in Blue contd.

Neighbourhood	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
Harbourfront East, Union Station, Toronto Islands	1	Coffee Shop	Aquarium	Café	Hotel	Brewery	Scenic Lookout	Fried Chicken Joint	Music Venue	History Museum	Pizza Place
Toronto Dominion Centre, Design Exchange	1	Coffee Shop	Hotel	Café	Salad Place	Bar	Beer Bar	Sporting Goods Shop	Gastropub	Bakery	Deli / Bodega
Commerce Court, Victoria Hotel	1	Coffee Shop	Café	Hotel	Gym	Deli / Bodega	Cocktail Bar	Beer Bar	Gastropub	Breakfast Spot	Bakery
Stn A PO Boxes	1	Coffee Shop	Café	Hotel	Beer Bar	Pub	Park	Farmers Market	Gym	Creperie	Cocktail Bar
First Canadian Place, Underground city	1	Coffee Shop	Café	Hotel	Gym	Salad Place	Deli / Bodega	Pizza Place	Beer Bar	Concert Hall	Gastropub
Church and Wellesley	1	Coffee Shop	Gay Bar	Yoga Studio	Pub	Hotel	Men's Store	Bubble Tea Shop	Café	Diner	Theater

Analysis of Downtown Toronto

Analysing Neighbourhoods with Venues excluding Restaurants

Cluster: 4 (Residential) in Sky Blue

Neighbourhood	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
Christie	3	Grocery Store	Café	Park	Athletics & Sports	Candy Store	Nightclub	Baby Store	Coffee Shop	Fried Chicken Joint	Deli / Bodega

Cluster: 5 (Entertainment) in Green

Neighbourhood	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
University of Toronto, Harbord	4	Café	Bookstore	Bakery	Sandwich Place	Bar	Yoga Studio	Coffee Shop	College Arts Building	College Gym	Pub
Kensington Market, Chinatown, Grange Park	4	Café	Coffee Shop	Bar	Bakery	Gaming Cafe	Dessert Shop	Park	Burger Joint	Pizza Place	Grocery Store
St. James Town, Cabbagetown	4	Coffee Shop	Café	Pizza Place	Pub	Bakery	Market	Park	Plaza	Playground	Pharmacy

Result

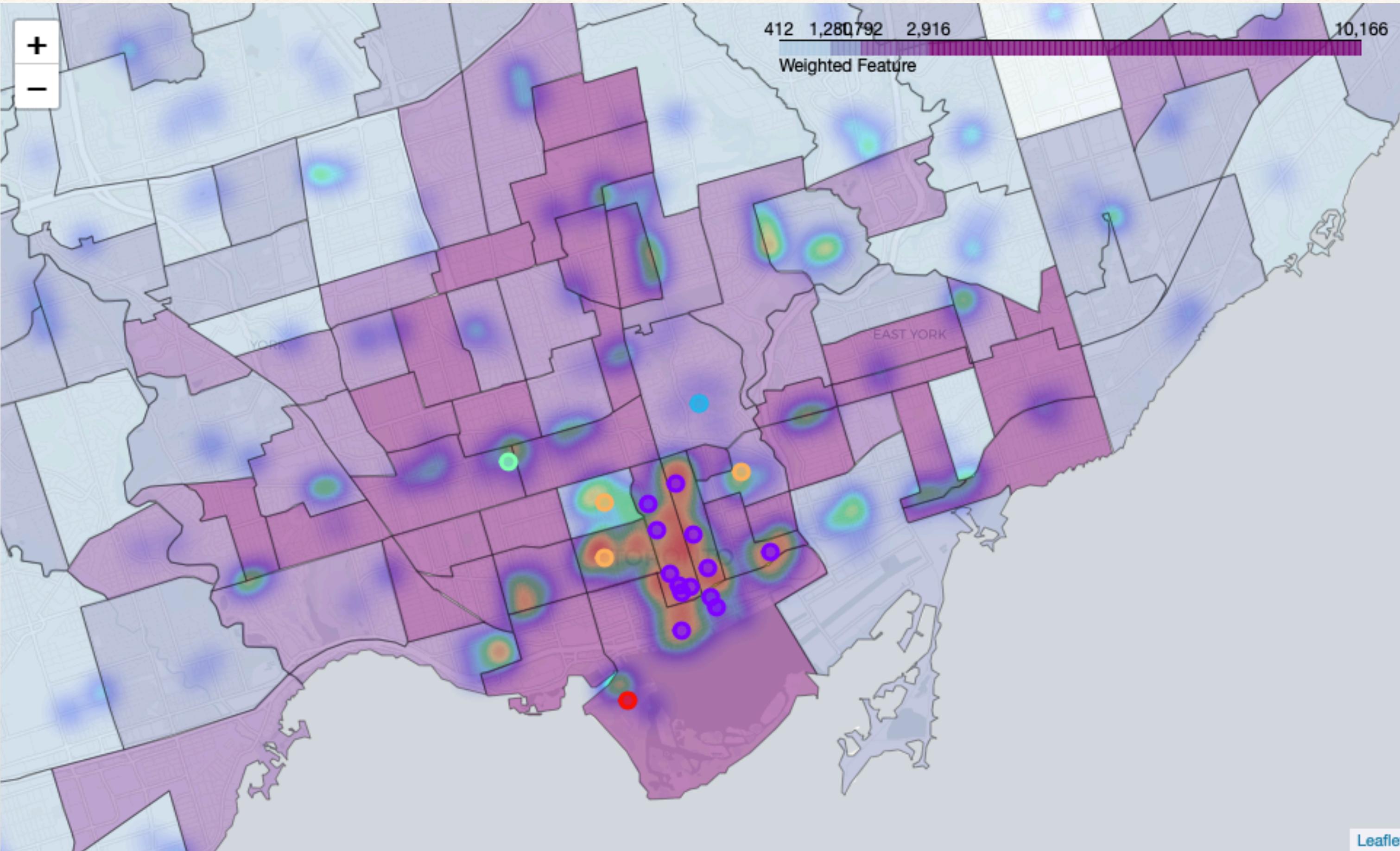
AIM: To find neighbourhood with

- Higher population density
- Higher median household income
- Higher concentration of working age group
- Highest number of popular venues
- Lowest number of steakhouse

AREA_S_CD	AREA_NAME	POPULATION	DENSITY	CHILDREN	YOUTH	WORKING AGE	PRE_RETIREMENT	SENIORS	MEDIAN_HOUSEHOLD_INCOME
74	North St.James Town (74)	18615	44321	12	12	56	10	9	41016
104	Mount Pleasant West (104)	29658	21969	8	9	59	10	13	61839
75	Church-Yonge Corridor (75)	31340	23044	4	15	61	10	10	56366
82	Niagara (82)	31180	10156	7	8	75	6	5	79441
84	Little Portugal (84)	15559	12859	9	11	62	8	10	66542
105	Lawrence Park North (105)	14607	6407	23	12	41	12	13	144963
97	Yonge-St.Clair (97)	12528	10708	10	8	48	12	23	80136
73	Moss Park (73)	20506	14753	8	11	62	11	9	52490
88	High Park North (88)	22162	11726	13	9	53	12	13	68116
95	Annex (95)	30526	10863	8	12	51	11	17	71053

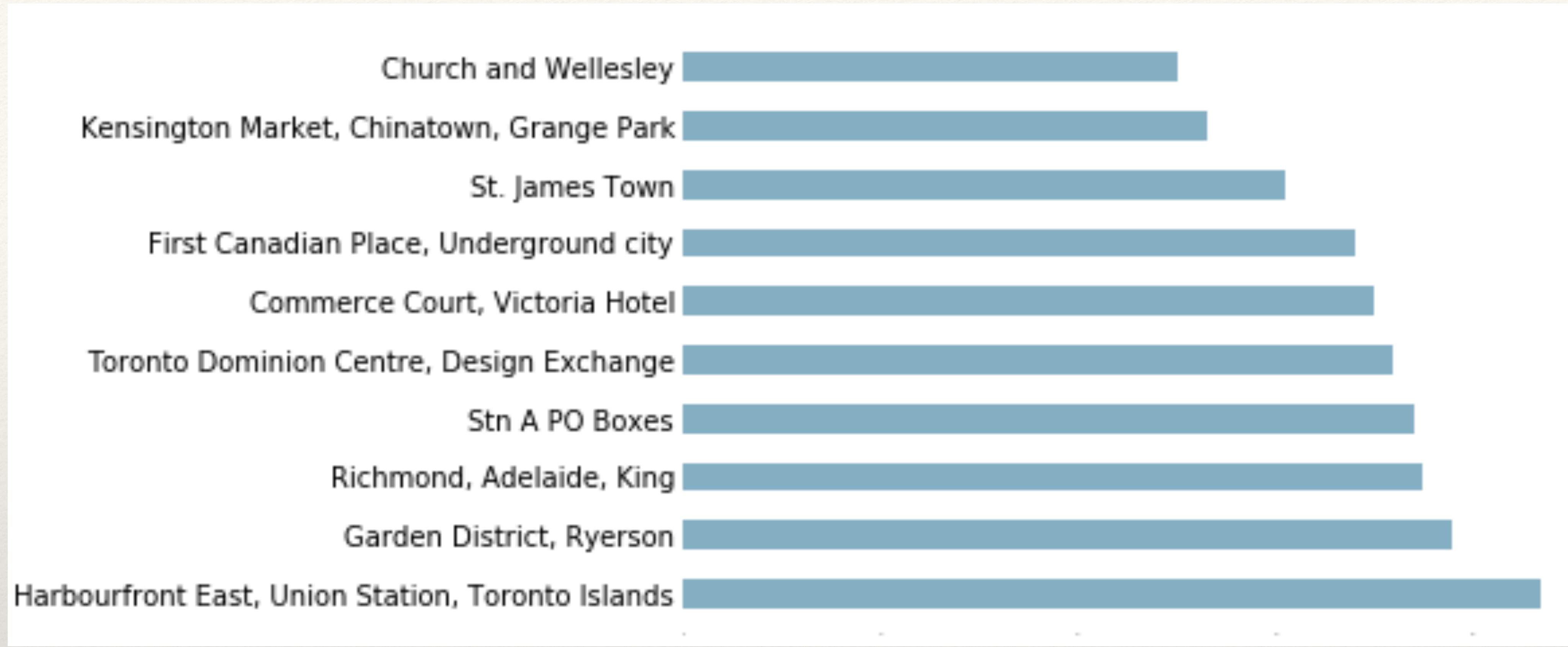
Weighted Feature

List of Neighbourhood with highest Weighted Feature



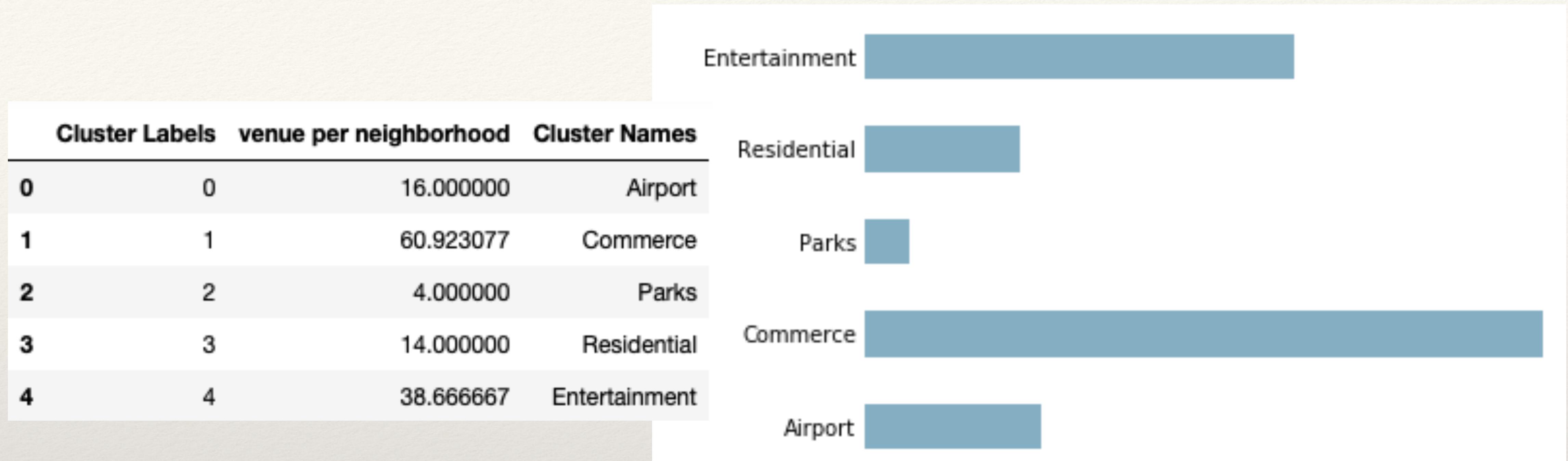
Downtown Toronto Neighbourhood

Neighbourhood clustered by venues
(excluding restaurants) and heat-map of all
venues superimposed onto choropleth map
of Downtown Toronto



Downtown Toronto Neighbourhood

Top 10 neighbourhoods with most number of popular venues.



Downtown Toronto Neighbourhood

Venues per neighbourhood in each Cluster

Thank You

-Subha Halder