Capstone Project - The Battle of Neighborhoods

The difference in shops distribution of New York and Toronto

Introduction

This analysis will finally came to the conclusion that the similar neighbors/boroughs of these two cities (in case of searching shops for coffee, deserts) in order for the people who has the previous described situation's selection.
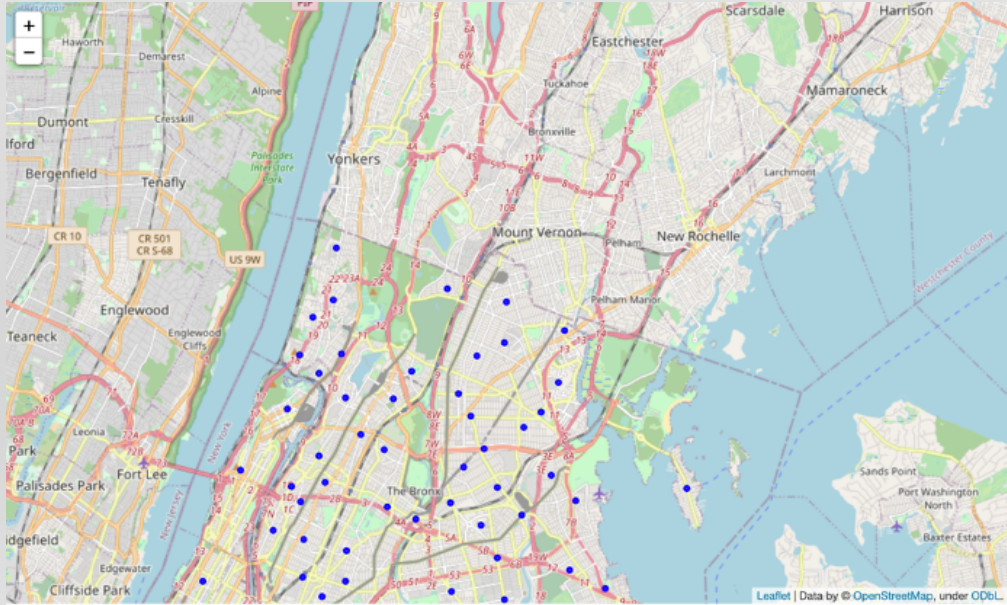
New York?

Toronto?

DATA

New York

	Postal Code	Borough	Neighbourhood
0	M3A	North York	Parkwoods
1	M4A	North York	Victoria Village
2	M5A	Downtown Toronto	Regent Park, Harbourfront
3	M6A	North York	Lawrence Manor, Lawrence Heights
4	M7A	Downtown Toronto	Queen's Park, Ontario Provincial Government

Toronto

	Borough	Neighbourhood	Latitude	Longitude
0	North York	Parkwoods	43.753259	-79.329656
1	North York	Victoria Village	43.725882	-79.315572
2	Downtown Toronto	Regent Park, Harbourfront	43.654260	-79.360636
3	North York	Lawrence Manor, Lawrence Heights	43.718518	-79.464763
4	Downtown Toronto	Queen's Park, Ontario Provincial Government	43.662301	-79.389494

Methodology

1. Filter as only category include 'shops'

New York

	Neighborhood	Borough	Latitude	Longitude	VenueName	VenueLatitude	VenueLongitude	VenueCategory
0	Wakefield	Bronx	40.894705	-73.847201	Lollipops Gelato	40.894123	-73.845892	Dessert Shop
1	Wakefield	Bronx	40.894705	-73.847201	Ripe Kitchen & Bar	40.898152	-73.838875	Caribbean Restaurant
2	Wakefield	Bronx	40.894705	-73.847201	Ali's Roti Shop	40.894036	-73.856935	Caribbean Restaurant
3	Wakefield	Bronx	40.894705	-73.847201	Jackie's West Indian Bakery	40.889283	-73.843310	Caribbean Restaurant
4	Wakefield	Bronx	40.894705	-73.847201	Rite Aid	40.889062	-73.842993	Pharmacy
5	Wakefield	Bronx	40.894705	-73.847201	Carvel Ice Cream	40.890487	-73.848568	Ice Cream Shop
6	Wakefield	Bronx	40.894705	-73.847201	Jimbo's	40.891740	-73.858226	Burger Joint
7	Wakefield	Bronx	40.894705	-73.847201	Dunkin'	40.890459	-73.849089	Donut Shop
8	Wakefield	Bronx	40.894705	-73.847201	Walgreens	40.896528	-73.844700	Pharmacy
9	Wakefield	Bronx	40.894705	-73.847201	Rite Aid	40.896649	-73.844846	Pharmacy
10	Wakefield	Bronx	40.894705	-73.847201	Subway	40.890468	-73.849152	Sandwich Place
11	Wakefield	Bronx	40.894705	-73.847201	Walgreens	40.898757	-73.854446	Pharmacy
12	Wakefield	Bronx	40.894705	-73.847201	Shell	40.894187	-73.845862	Gas Station
13	Wakefield	Bronx	40.894705	-73.847201	T-Mobile	40.893216	-73.857251	Mobile Phone Shop
14	Wakefield	Bronx	40.894705	-73.847201	Popeyes Louisiana Kitchen	40.898292	-73.854719	Fried Chicken Joint

```
array(['Dessert Shop', 'Ice Cream Shop', 'Donut Shop',
       'Mobile Phone Shop', 'Food & Drink Shop', 'Flower Shop',
       'Shopping Mall', 'Bagel Shop', 'Coffee Shop', 'Miscellaneous Shop',
       'Sporting Goods Shop', 'Cosmetics Shop', 'Wine Shop',
       'Supplement Shop', 'Automotive Shop', 'Shop & Service',
       'Frozen Yogurt Shop', 'Gourmet Shop', 'Smoke Shop',
       'Fish & Chips Shop', 'Gift Shop', 'Hobby Shop', 'Cupcake Shop',
       'Print Shop', 'Cheese Shop', 'Optical Shop', 'Bubble Tea Shop',
       'Bike Shop', 'Record Shop', 'Other Repair Shop', 'Comic Shop',
       'Antique Shop', 'Pie Shop', 'Motorcycle Shop', 'Souvenir Shop',
       'Shopping Plaza', 'Board Shop', 'Tailor Shop', 'Chocolate Shop'],
      dtype=object)
```

Toronto

	Neighborhood	Borough	Latitude	Longitude	VenueName	VenueLatitude	VenueLongitude	VenueCategory
0	Parkwoods	North York	43.753259	-79.329656	Allwyn's Bakery	43.759840	-79.324719	Caribbean Restaurant
1	Parkwoods	North York	43.753259	-79.329656	Brookbanks Park	43.751976	-79.332140	Park
2	Parkwoods	North York	43.753259	-79.329656	Tim Hortons	43.760668	-79.326368	Café
3	Parkwoods	North York	43.753259	-79.329656	Bruno's valu-mart	43.746143	-79.324630	Grocery Store
4	Parkwoods	North York	43.753259	-79.329656	High Street Fish & Chips	43.745260	-79.324949	Fish & Chips Shop

```
array(['Fish & Chips Shop', 'Food & Drink Shop', 'Coffee Shop',
       'Shopping Mall', 'Cosmetics Shop', 'Shop & Service',
       'Chocolate Shop', 'Dessert Shop', 'Ice Cream Shop', 'Cheese Shop',
       'Miscellaneous Shop', 'Bubble Tea Shop', 'Hobby Shop',
       'Smoke Shop', 'Gift Shop', 'Gourmet Shop', 'Comic Shop'],
      dtype=object)
```

Methodology

2. One hot encoding

New York

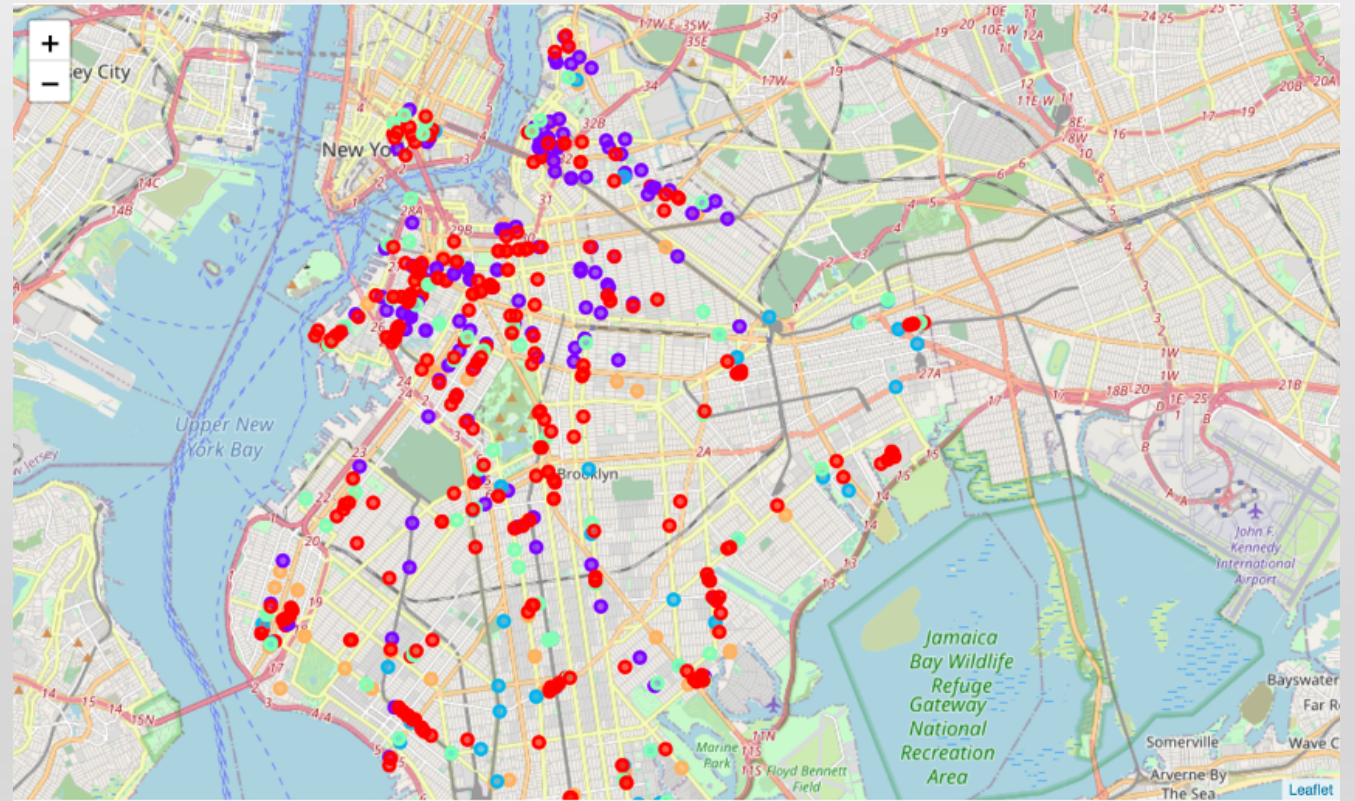|	Antique Shop	Automotive Shop	Bagel Shop	Bike Shop	Board Shop	Bubble Tea Shop	Cheese Shop	Chocolate Shop	Coffee Shop	Comic Shop	Cosmetics Shop	Cupcake Shop	Dessert Shop	Don Sho
0	1	0	0	0	0	0	0	0	0	0	0	0	0	
1	1	0	0	0	0	0	0	0	0	0	0	0	0	
2	1	0	0	0	0	0	0	0	0	0	0	0	0	
3	1	0	0	0	0	0	0	0	0	0	0	0	0	
4	0	1	0	0	0	0	0	0	0	0	0	0	0	

Toronto

	Bubble Tea Shop	Cheese Shop	Chocolate Shop	Coffee Shop	Comic Shop	Cosmetics Shop	Dessert Shop	Fish & Chips Shop	Food & Drink Shop	Gift Shop	Gourmet Shop	Hobby Shop	Ice Cream Shop	Miscellane S
0	1	0	0	0	0	0	0	0	0	0	0	0	0	
1	1	0	0	0	0	0	0	0	0	0	0	0	0	
2	0	1	0	0	0	0	0	0	0	0	0	0	0	
3	0	0	1	0	0	0	0	0	0	0	0	0	0	
4	0	0	0	1	0	0	0	0	0	0	0	0	0	

3. K-means clustering

Result & Discussion

New York


```
Hobby Shop           2
Comic Shop           2
Other Repair Shop    2
Motorcycle Shop      2
Shop & Service       2
Shopping Plaza       1
Print Shop           1
Chocolate Shop       1
Souvenir Shop        1
Tailor Shop          1
Name: VenueCategory, dtype: int64
Coffee Shop     252
Name: VenueCategory, dtype: int64
Donut Shop      187
Name: VenueCategory, dtype: int64
Ice Cream Shop      125
Name: VenueCategory, dtype: int64
Bagel Shop       95
Name: VenueCategory, dtype: int64
```
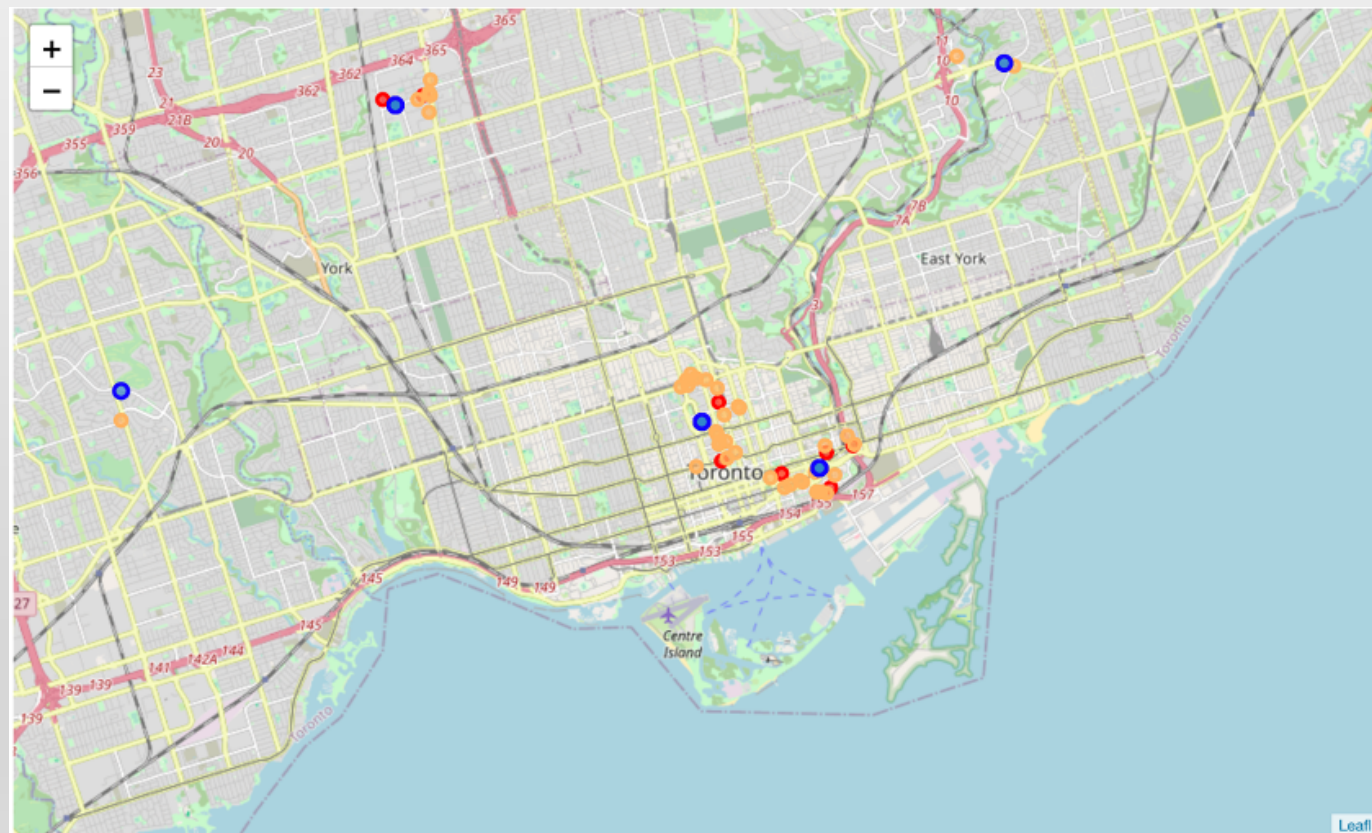
Result & Discussion

Toronto

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Dessert Shop           3
Miscellaneous Shop     2
Bubble Tea Shop        2
Comic Shop             1
Cheese Shop            1
Hobby Shop             1
Gift Shop              1
Food & Drink Shop      1
Shop & Service         1
Fish & Chips Shop      1
Chocolate Shop         1
Gourmet Shop           1
Smoke Shop             1
Name: VenueCategory, dtype: int64
Coffee Shop           31
Name: VenueCategory, dtype: int64
Cosmetics Shop         4
Name: VenueCategory, dtype: int64
Shopping Mall          4
Name: VenueCategory, dtype: int64
Ice Cream Shop         3
Name: VenueCategory, dtype: int64
```

Conclusion

It is worthwhile to see the difference in distribution of shops of these two cities if a person needs to re-locate within these two cities. It is clearly that if the person is accustomed to the happy hour of the New York with its flourish shops, it is better to move to the Toronto that is around downtown since it has the most crowded shops distribution there. The location selection is based on the person's needs.

New York?   V.S.   Toronto?