Battle of Neighborhoods
New York City and Toronto

Saubhik Bagchi

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Introduction

In today's world, it's very common for people to relocate from one city to other across the world for education, business, jobs and other personal reasons. Someone getting a better job offer from another city may decide to relocate however she/he would like to find out a neighborhood in the new city where similar amenities are available so that she/he can feel comfortable after relocating to the new place.

If someone likes the comfort of quality Italian food in her neighborhood restaurants, she would probably look for a neighborhood in the new city where there are plenty of good Italian restaurants around her. Same goes for other amenities like coffee shops, school, gym, amusement park, grocery stores, super markets etc.
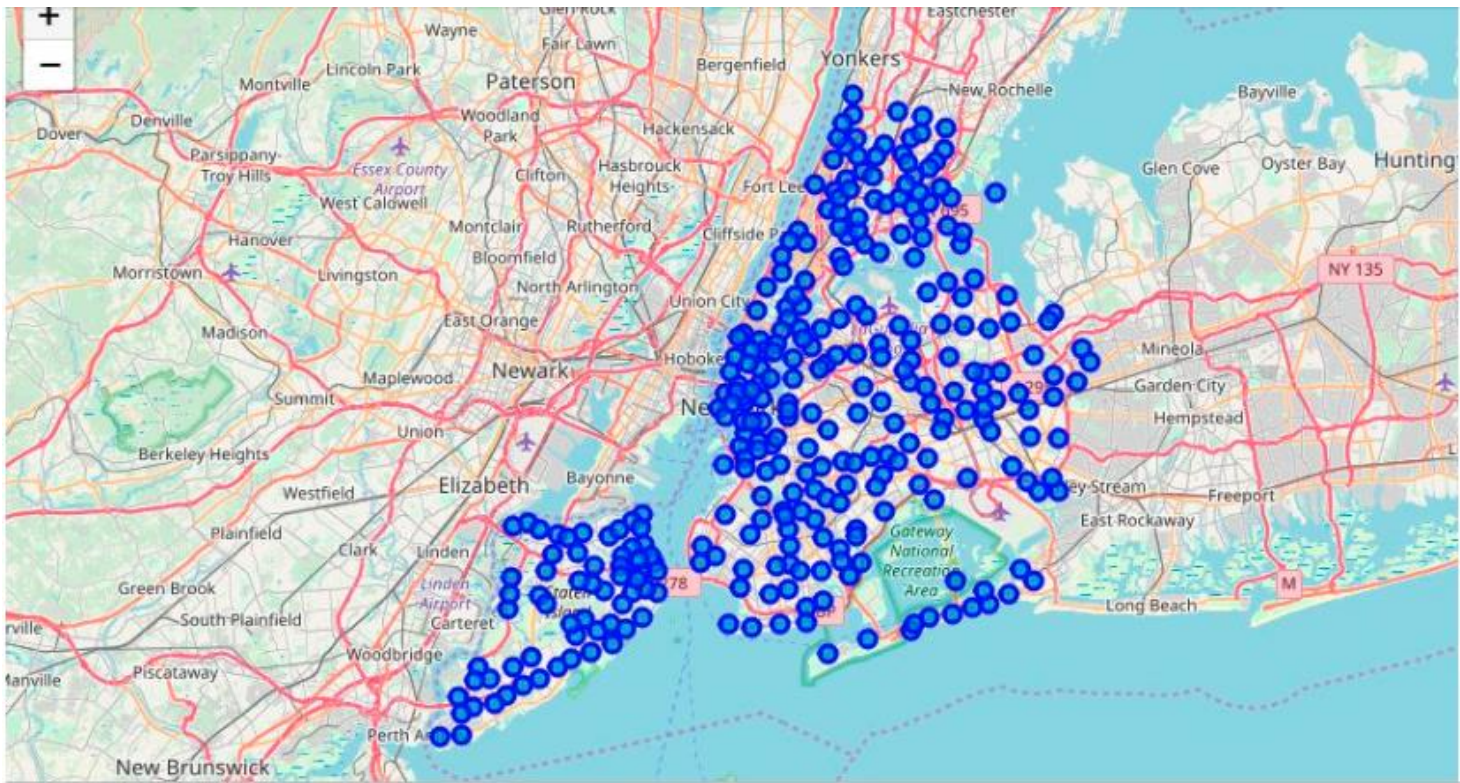
Business Problem

Let me define a business problem for this project. Debbie lives in Bronx, Riverdale, New York and she loves her neighborhood. She got a great job offer from Toronto, and she decided to relocate to Toronto in 2 weeks' time to take up the new opportunity.

Debbie wants to find out a neighborhood in Toronto where she would get similar amenities available around her that she gets in Bronx. Our problem statement is to explore the neighborhoods of Toronto and see which of them closely matches with Bronx and provides similar amenities. Based on our analysis we can recommend Debbie which Toronto neighborhoods should be the top choice for her!
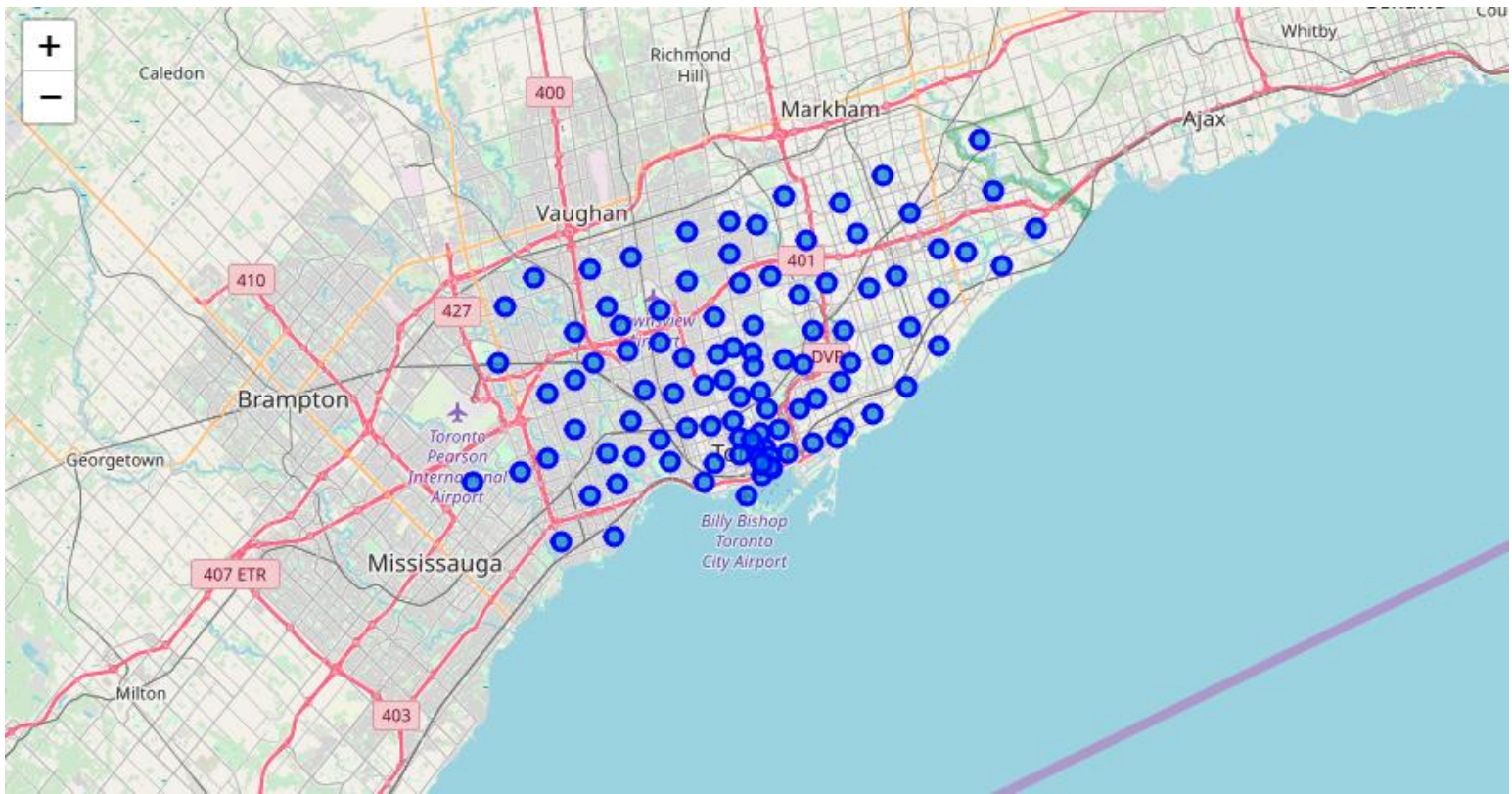
New York City Data

	Borough	Neighborhood	Latitude	Longitude
0	Bronx	Wakefield	40.894705	-73.847201
1	Bronx	Co-op City	40.874294	-73.829939
2	Bronx	Eastchester	40.887556	-73.827806
3	Bronx	Fieldston	40.895437	-73.905643
4	Bronx	Riverdale	40.890834	-73.912585

New York neighborhoods are shown on the map, we will use Foursquare API to get venue information for the neighborhoods

Toronto Data

	PostalCode	Borough	Neighborhood	Latitude	Longitude
0	M1B	Scarborough	Rouge,Malvern	43.806686	-79.194353
1	M1C	Scarborough	Highland Creek,Rouge Hill,Port Union	43.784535	-79.160497
2	M1E	Scarborough	Guildwood,Morningside,West Hill	43.763573	-79.188711
3	M1G	Scarborough	Woburn	43.770992	-79.216917
4	M1H	Scarborough	Cedarbrae	43.773136	-79.239476

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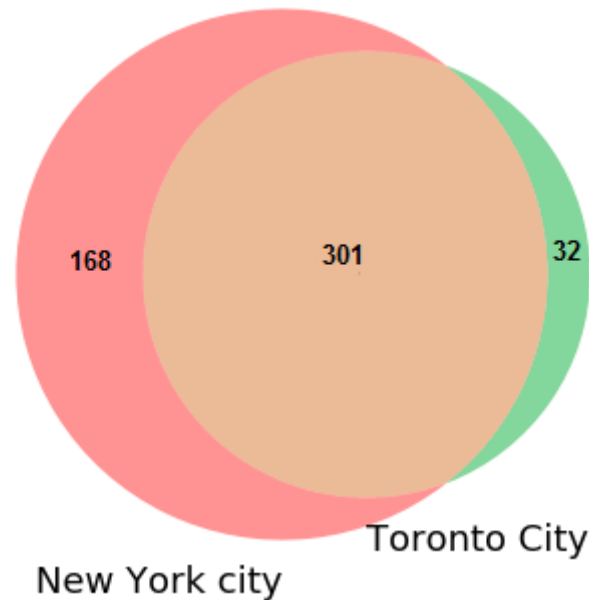
Exploratory Data Analysis

New York City and Toronto has different number of venues. New York has 469 and Toronto has 333 venue categories. There are some common venue categories in both cities. We'll find the common venue categories and keep only these common categories to find similar neighborhoods.

Common venue categories : 301

Other categories in New York City are: 168

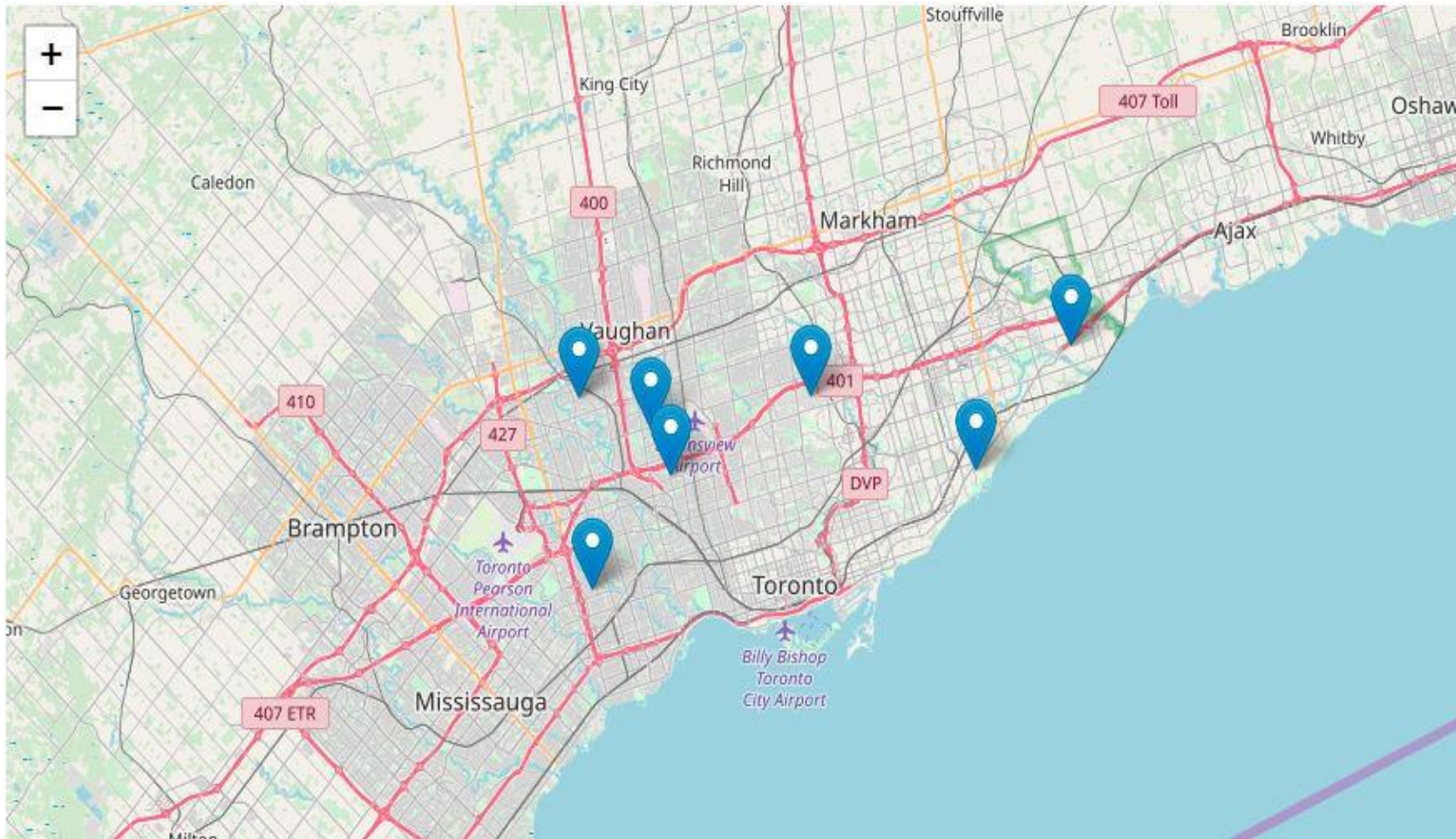Other categories in Toronto are   : 32

Find most similar location using Cosine Similarity

We get all common venue categories of Bronx and calculate matrix product with Toronto City common venue data. This will give quantitative measure of similarity of each borough of Toronto city to Bronx. We can sort in descending order and select top 7 similar boroughs

	PostalCode	Borough	Neighborhood	Latitude	Longitude	Accessories Store	Adult Boutique	Afghan Restaurant	African Restaurant	Airport Lounge	America Restaurant
84	M9L	North York	Humber Summit	43.756303	-79.565963	0.0	0.0	0.0	0.0	0.0	0.00000
65	M2L	North York	Silver Hills,York Mills	43.757490	-79.374714	0.0	0.0	0.0	0.0	0.0	0.00000
6	M9B	Etobicoke	Cloverdale,Islington,Martin Grove,Princess Gar...	43.650943	-79.554724	0.0	0.0	0.0	0.0	0.0	0.05555
76	M3L	North York	Downsview West	43.739015	-79.506944	0.0	0.0	0.0	0.0	0.0	0.00000
87	M1C	Scarborough	Highland Creek,Rouge Hill,Port Union	43.784535	-79.160497	0.0	0.0	0.0	0.0	0.0	0.00000
83	M6L	North York	Downsview,North Park,Upwood Park	43.713756	-79.490074	0.0	0.0	0.0	0.0	0.0	0.00000
94	M1M	Scarborough	Cliffcrest,Cliffside,Scarborough Village West	43.716316	-79.239476	0.0	0.0	0.0	0.0	0.0	0.00000

See the top 7 locations on map

See the entire report of this project at this link https://github.com/saubhik-bagchi/data-science-capstone/blob/master/Report-Battle%20of%20Neighborhoods.pdf

Conclusion

We started this project with a problem statement for Debbie. She lives in Bronx, Riverdale, New York and she loves her neighborhood. She got a great job offer from Toronto, and she decided to relocate to Toronto in 2 weeks' time to take up the new opportunity.

Debbie wants to find out a neighborhood in Toronto where she would get similar amenities available around her that she gets in Bronx. We retrieved location information using Foursquare API, used exploratory data analysis and Cosine Similarity algorithm to identify top 7 neighborhood of Toronto which closely resembles Bronx. Now Debbie can get over the battle of neighborhood and can confidently choose a Toronto neighborhood that will be identical to Bronx!

Thank you