Coffee Project

Applied Data Science Capstone
IBM Data Science Profissional Certificate

Introduction

- Toronto is the fourth largest city in North America and the (multi)cultural centre of Canada. The city has become an incredibly diverse melting pot for food and drink culture driven by individuals inspired to share their traditions and ideas. But in a city that prides itself on its eclectic offerings, there is one industry that has been a bit late to the party: coffee.

Business Problem

- This project aims to target people who are passionate about having coffee to find the best establishments in the city of Toronto and for those who are interested in opening a coffee shop know the best regions to open your business.

Stakeholders' Questions

- What is the best location in Toronto for have a coffee?
- Which areas have potential Coffee Shop Market?
- Which areas lack Coffee Shops?
- Which is the best borough to stay if I want have a coffee?
- Which is the best Coffee Shop in Toronto?
- Which Coffee Shop is rated highest in Toronto?

Data

- **Toronto data that contains list of Boroughs, Neighborhoods.**
➢ We will web scraping the Toronto data from Wikipedia.

- **Coffee Shop in each neighborhood of Toronto.**
➢ By using Foursquare API as its prime data gathering source as it has a database of millions of places.

- **GeoSpace data**
➢ By using this geo space data we will get the Toronto Borough boundaries that will help us visualize choropleth map.
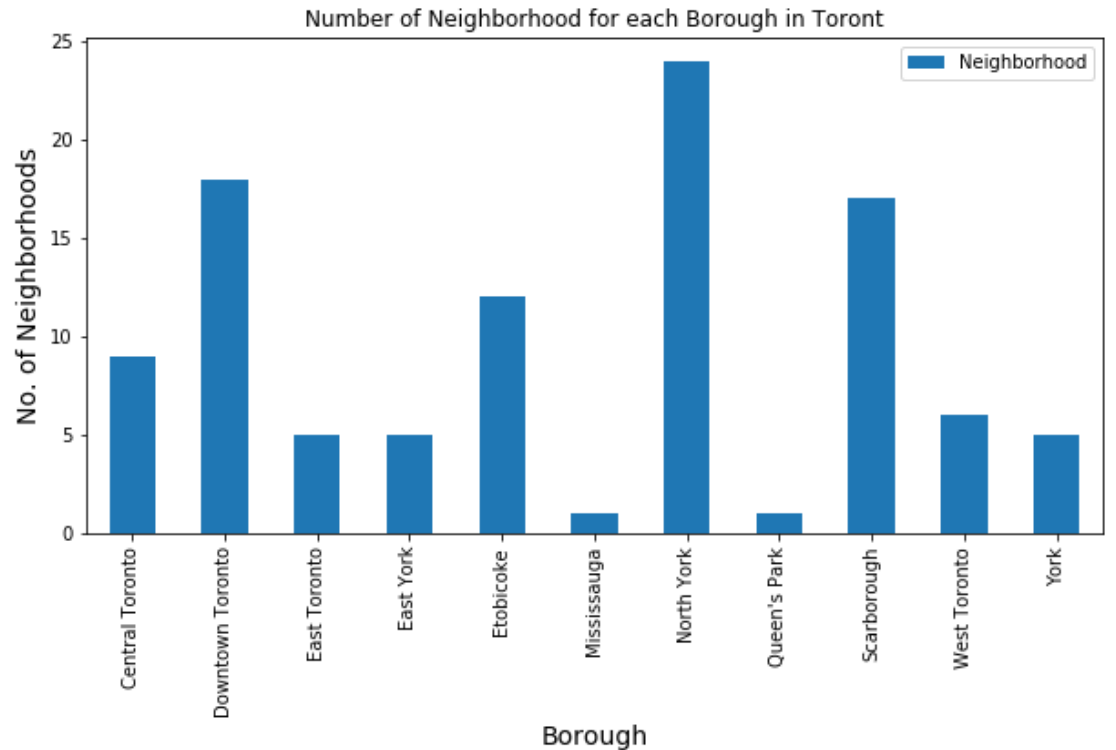
Data Cleansing

- The Data scraped is combined in one table:

	Borough	Neighborhood	Latitude	Longitude
0	North York	Parkwoods	43.753259	-79.329656
1	North York	Victoria Village	43.725882	-79.315572
2	Downtown Toronto	Harbourfront,Regent Park	43.654260	-79.360636
3	North York	Lawrence Heights,Lawrence Manor	43.718518	-79.464763
4	Queen's Park	Queen's Park	43.662301	-79.389494
5	Etobicoke	Islington Avenue	43.667856	-79.532242
6	Scarborough	Rouge,Malvern	43.806686	-79.194353
7	North York	Don Mills North	43.745906	-79.352188
8	East York	Woodbine Gardens,Parkview Hill	43.706397	-79.309937
9	Downtown Toronto	Ryerson,Garden District	43.657162	-79.378937
10	North York	Glencairn	43.709577	-79.445073
11	Etobicoke	Cloverdale,Islington,Martin Grove,Princess Gar...	43.650943	-79.554724

Feature Selection

- After the data cleaning, the data frame has 11 boroughs and 103 neighborhoods in the city of Toronto. Making a bar chart we can visualize the differences of each neighborhood and the number of Coffee Shops.

Number of Neighborhood for each Borough in Toront

Filtering Coffee Shops

- We prepared a neighborhood list that contains Coffee Shops with the second function describe above. We created a table with name of the Coffee Shops and the unique id.

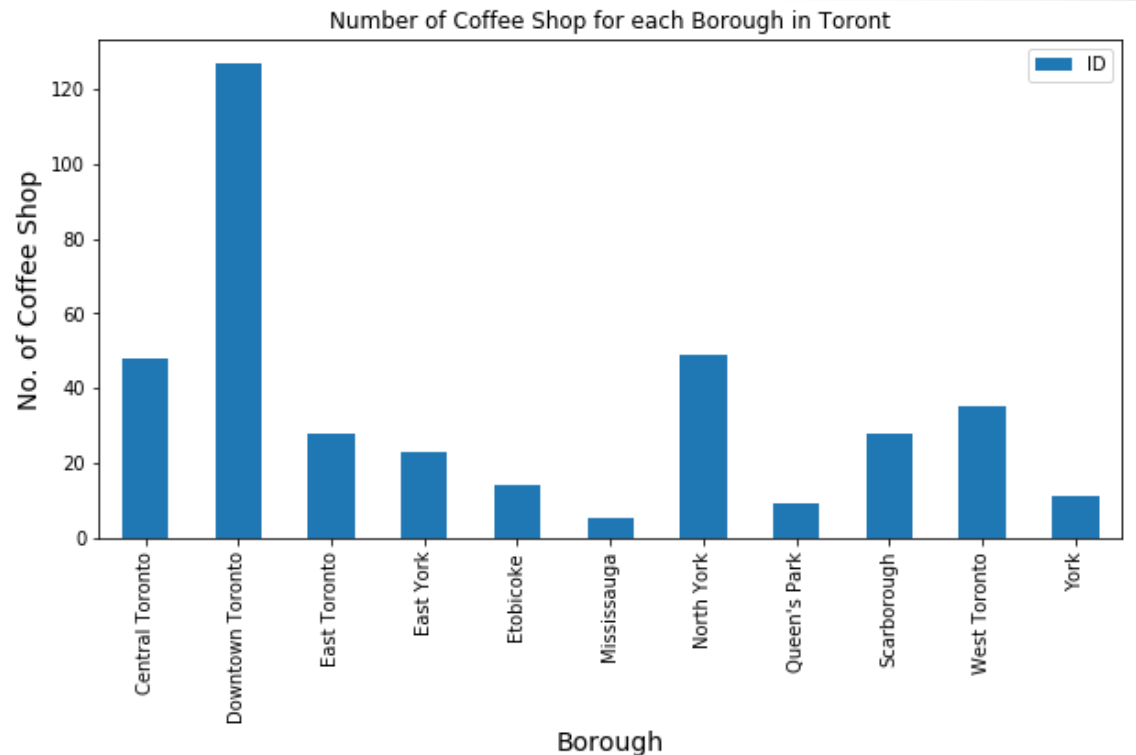|	Borough	Neighborhood	ID	Name
0	North York	Parkwoods	4b87107cf964a5207fae31e3	La Notre
1	North York	Victoria Village	4bbe904a85fbb713420d7167	Tim Hortons
2	North York	Victoria Village	4b609d8df964a52068f029e3	Tim Hortons
3	Downtown Toronto	Harbourfront,Regent Park	53b8466a498e83df908c3f21	Tandem Coffee
4	Downtown Toronto	Harbourfront,Regent Park	57cd9d20498e6ab8342980e2	Arvo

Filtering Coffee Shops

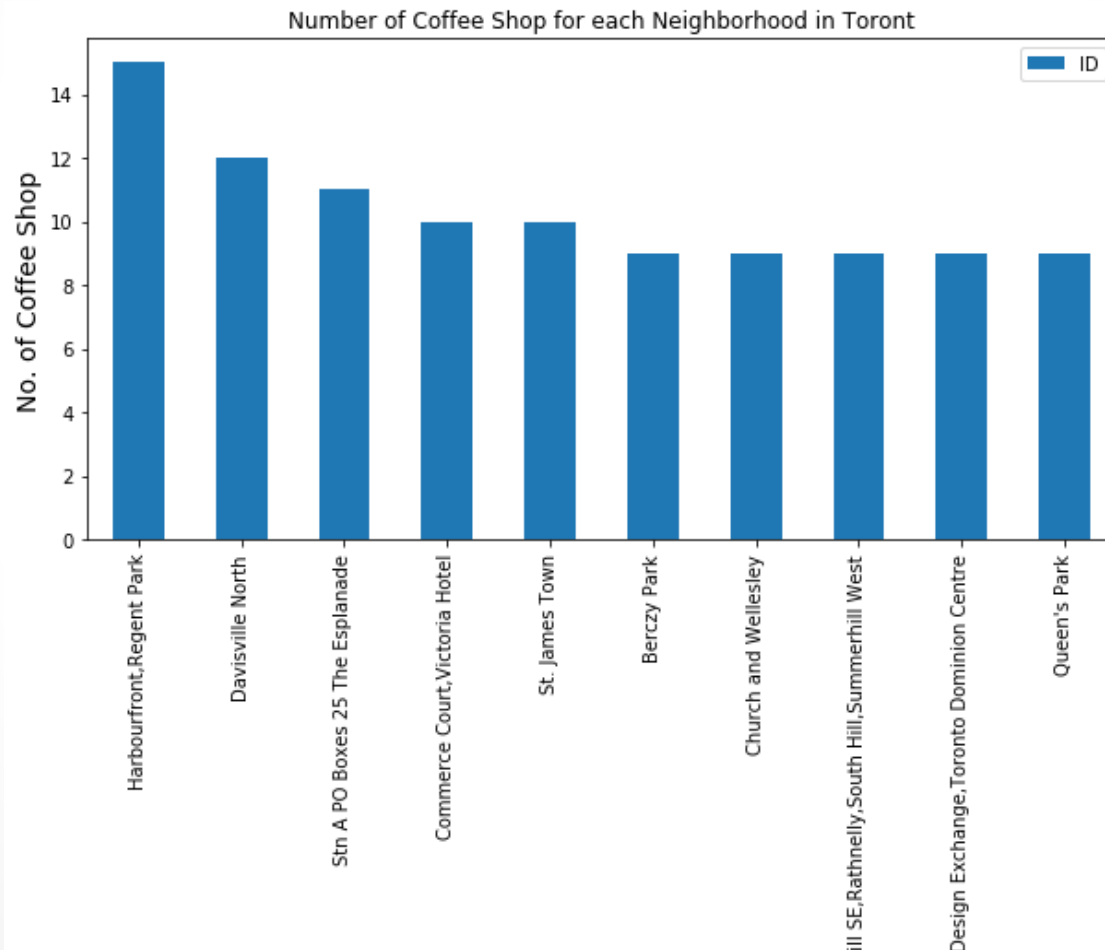- we created also a table that contains names, id, number of likes, rating and tips.

	Borough	Neighborhood	ID	Name	Likes	Rating	Tips
0	North York	Parkwoods	0	0	0	0	0
1	North York	Victoria Village	4bbe904a85fbb713420d7167	Tim Hortons	21	6.4	7
2	North York	Victoria Village	4b609d8df964a52068f029e3	Tim Hortons	23	6.1	13
3	Downtown Toronto	Harbourfront,Regent Park	53b8466a498e83df908c3f21	Tandem Coffee	47	8.7	20
4	Downtown Toronto	Harbourfront,Regent Park	57cd9d20498e6ab8342980e2	Arvo	53	9.2	10

Analysing the Data

- With both tables we create different analyzes so we can discriminate and answer the questions described in the Business Problem section.

- The first was determinate the number of Coffee Shops for each borough and neighborhood in Toronto city.

Number of Coffee Shop for each Borough in Toront

Analysing the Data

Number of Coffee Shop for each Neighborhood in Toront

Analysing the Data

- Further analysis is to know which Coffee shop that has the maximum rating and the maximum number of likes and tips.

- Coffee shops with maximum likes:

```
Borough                               Downtown Toronto
Neighborhood        Chinatown,Grange Park,Kensington Market
ID                              4ad76dadf964a520530a21e3
Name                            Dark Horse Espresso Bar
Likes                                               355
Rating                                              8.4
Tips                                                169
Name: 313, dtype: object
```

Analysing the Data

- Coffee shops with maximum Rating:

```
Borough                     Downtown Toronto
Neighborhood        Harbourfront,Regent Park
ID                  57cd9d20498e6ab8342980e2
Name                                    Arvo
Likes                                     53
Rating                                   9.2
Tips                                      10
Name: 4, dtype: object
```
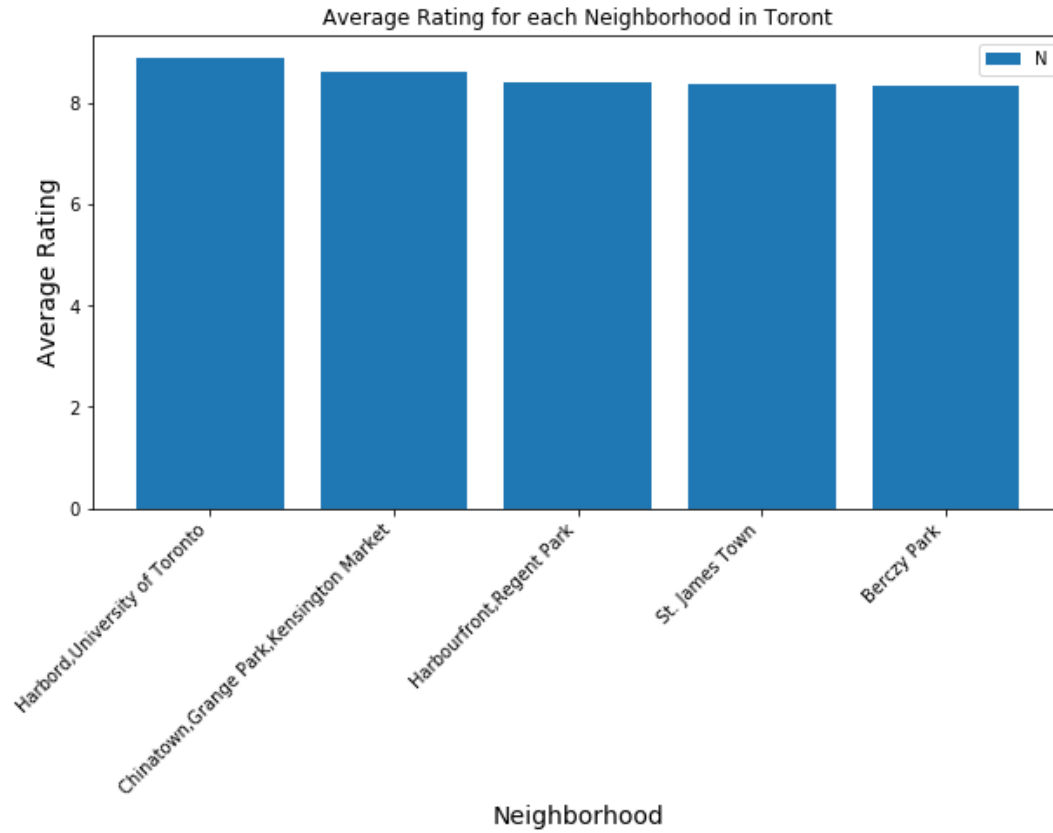
- Coffee shops with maximum Tips:

```
Borough                            Downtown Toronto
Neighborhood     Chinatown,Grange Park,Kensington Market
ID                         4ad76dadf964a520530a21e3
Name                        Dark Horse Espresso Bar
Likes                                          355
Rating                                         8.4
Tips                                           169
Name: 313, dtype: object
```

Analysing the Data

- The next analysis is to know average rating of each neighborhood and borough.

- For this we create a table with the average rating and then make a bar chart.

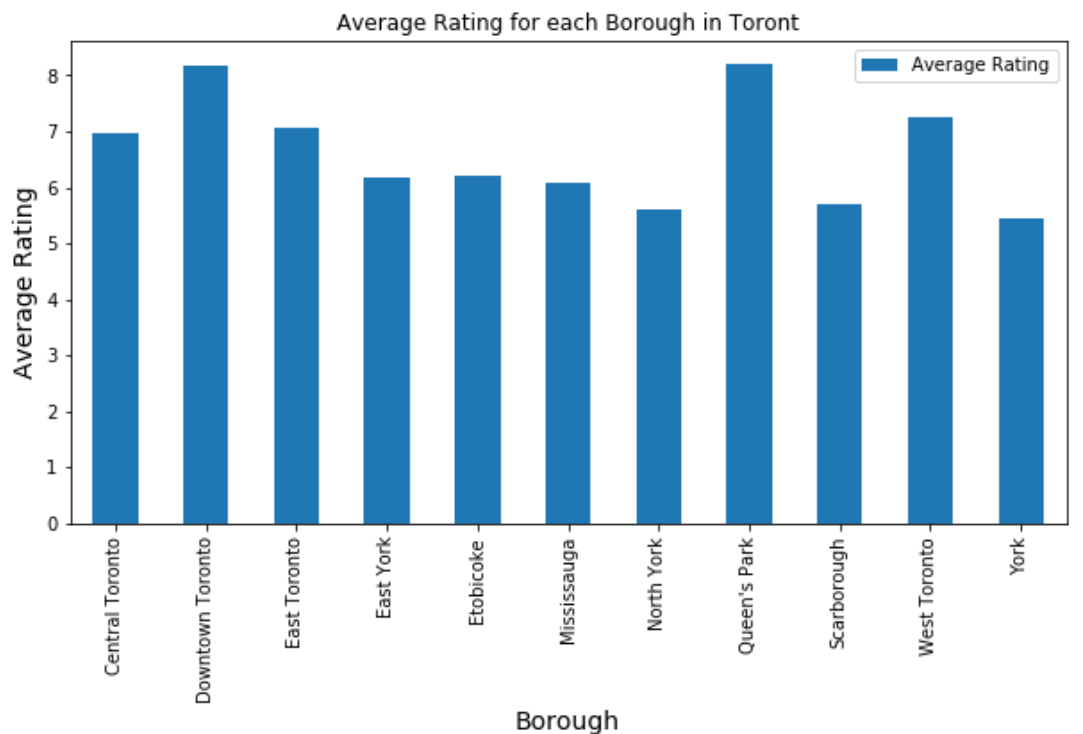|	Neighborhood	Average Rating
43	Harbord,University of Toronto	8.900000
18	Chinatown,Grange Park,Kensington Market	8.633333
45	Harbourfront,Regent Park	8.420000
71	St. James Town	8.370000
7	Berczy Park	8.355556
72	Stn A PO Boxes 25 The Esplanade	8.290909
59	North Toronto West	8.266667
69	Ryerson,Garden District	8.257143
0	Adelaide,King,Richmond	8.257143
12	CN Tower,Bathurst Quay,Island airport,Harbourf...	8.250000
64	Queen's Park	8.211111
38	First Canadian Place,Underground city	8.200000
13	Cabbagetown,St. James Town	8.200000
55	Little Portugal,Trinity	8.200000
23	Commerce Court,Victoria Hotel	8.190000

Analysing the Data
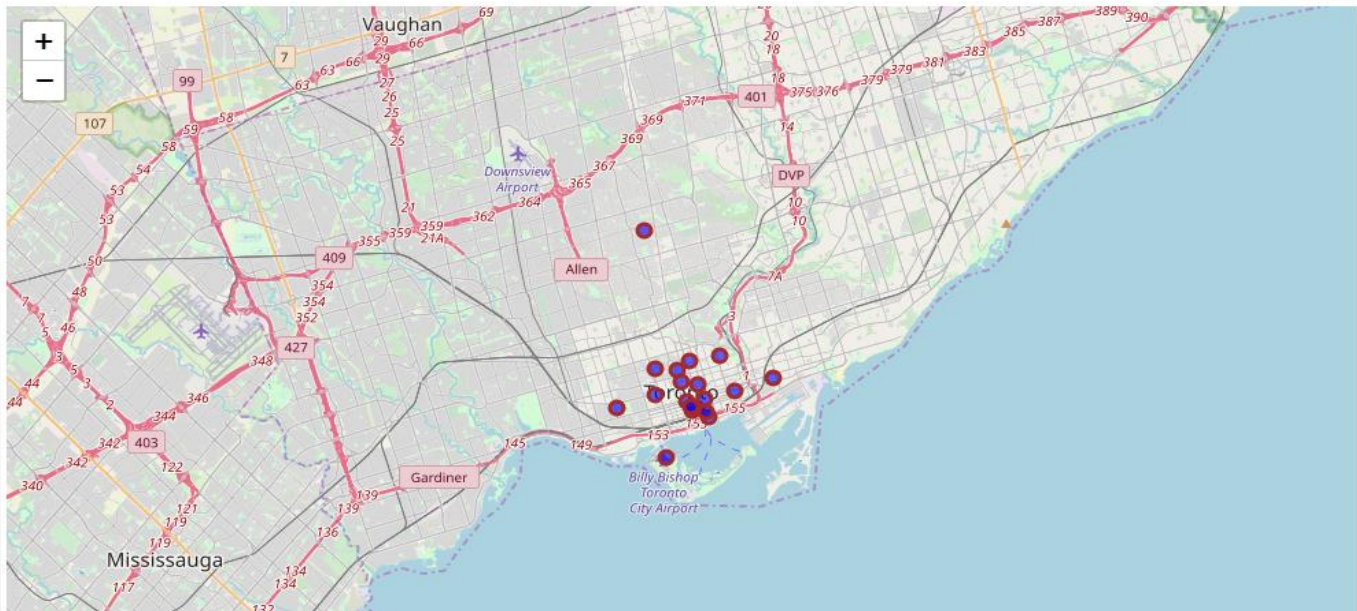
Analysing the Data

- Similarly, we created a table with boroughs and their respective average rating. And then we make another bar chart.

	Borough	Average Rating
7	Queen's Park	8.211111
1	Downtown Toronto	8.185827
9	West Toronto	7.254286
2	East Toronto	7.064286
0	Central Toronto	6.981250
4	Etobicoke	6.221429
3	East York	6.165217
5	Mississauga	6.080000
8	Scarborough	5.692857
6	North York	5.608163
10	York	5.454545

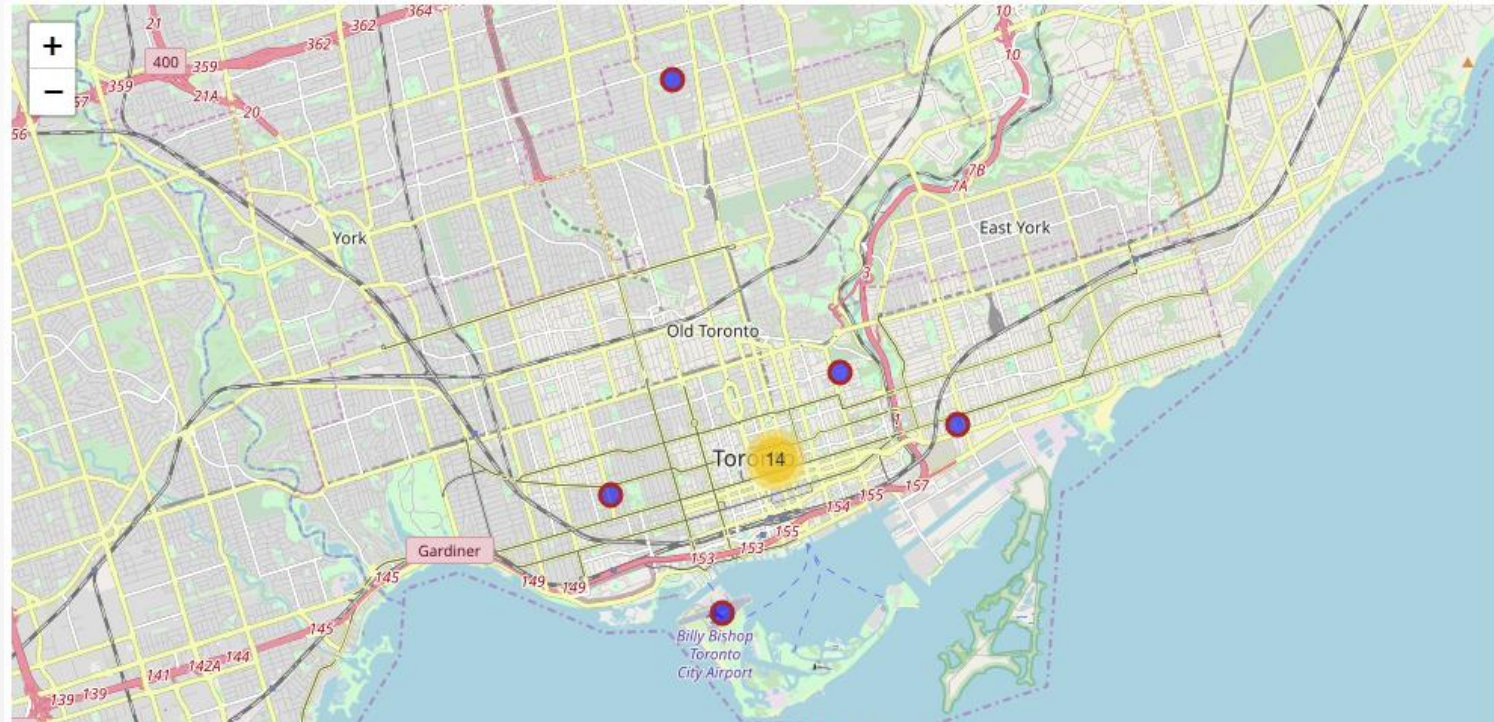
Average Rating for each Borough in Toront

Creating Maps

- The ultimate goal of our project is to build maps that can help analyze coffee shops in Toronto. And the first one of them we built to show the coffee shops in each neighborhood with an average rating above 8.0.

Analysing the Data

- With plugins:

Conclusion

1. **What is the best location in Toronto for have a coffee?**

The Adelaide, King, Richmond and Berczy Park are some of the best neighborhoods for have a coffee in Toronto.

2. **Which areas have potential Coffee Shop Market?**

Queen's Park is the best borough for have a coffee. The average rating for this borough is around 8.21.

Conclusion

3. Which areas lack Coffee Shops?

The area that lacks good Coffee Shops is York with an average rating of 5.45.

4. Which is the best borough to stay if I want have a coffee?

For this matter, we need to do additional analysis that encompasses other features to make a better decision. These analyzes are complementary goals for this project. But answering the question with the data in hand, the best neighborhood is the one with the highest average rating, hence Queen's park.

Conclusion

5. Which is the best Coffee Shop in Toronto?

This question we will answer based on maximum likes, hence Dark Horse Espresso Bar.

6. Which Coffee Shop is rated highest in Toronto?

The Coffee Shop in Toronto with the highest rating is Arvo.

THANKS