

Exploring New York City and the city of Toronto

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1. Aims

The main idea of this project is to explore New York City and the city of Toronto. Both towns have a high-density population, with New York City being the largest city in the US (even without Brooklyn), with 8.40 million residents. Toronto is the most populated city in Canada, being the home of over 5 million people.

There are hundreds of neighborhoods in New York City and 140 neighborhoods in Toronto. The cities have a great diversity in their communities and venues, considered by the World Atlas as one of the world's most diverse cities.

This project will analyze the district, areas, and venues of both cities. The data will contain pieces of information such as the name of the neighborhood, the borough, the latitude, the longitude, and their Postal Code. Another tool will also be used to explore the venues in those cities, including restaurants, cafes, bars, and gyms.

Because data visualization plays a massive role in Data Science, tables, graphs, and maps will be used to present the project in an easy to understand manner.

To complete this activity, a dataset from New York City and the city of Toronto will be used, in addition to the Foursquare tool.

2. Objectives

At the end of this report, the reader will know more about the demographics of New York City and the city of Toronto. For example, a map will be used to cluster neighborhoods in both cities; a bar graph will provide information on Toronto Population Data; another bar graph will explore New York Population History from 1840 until 2018; a scatter plot will display New York city's unemployment rate, from January 2019 until June 2020.

3. Introduction

3.1 Background

As stated in the TimeOut website, New York City was voted the best city in the world in a new global survey, due to its diversity and culture. According to Will Gleason, "The Time Out Index recently surveyed people in 48 cities around the globe and asked them about their city and others. After compiling the thoughts of over 30,000 people, both from our NYC readership and half-a-world away, New York was voted the greatest city on the planet for 2019. In a hint as to why this happened, and why now, it also lead the categories of most diverse metropolis and best culture. As far as being welcoming and aspirational, it was second only to Tokyo as the place most people want to visit."(Gleason, 2019)

Toronto is the largest city in Canada. The Telegraph website ranked it as the 16th most significant city to live in. As reported by Elizabeth Trovall, in The Intern Group website, "Toronto consistently wins awards for being so lovably liveable. In 2015, The Economist magazine ranked Toronto as the World's Best Place to Live in their Economist Intelligence Unit. Toronto ranked highly based on its safety, cost of living, business environment, liveability, food security and democracy." (Trovall, 2017)

As stated above, New York City and the city of Toronto are significant cities in the world. They are being worth exploring its demographics, venues, neighborhoods, and venues.

3.2 Method of Investigation

Several websites were used to acquire the data to produce this report. Those websites will be available at the Works Cited page. Tools such as Jupyter Notebook, Matplotlib, Pandas, Numpy, Scikit-learn, Geopy, Folium, and Foursquare Developer were applied to generate bar graphs, pie charts, maps, and tables to explore the New York City's and city of Toronto's data.

3.3 Scope

The scope of this report will embrace New York City's and the city of Toronto's demographics, venues, neighborhoods, boroughs, and venues.

4. City of Toronto

In the article, Toronto, Brett McGillivray and Thomas Howarth claimed that "[Toronto] It is the most populous city in Canada, a multicultural city, and the country's financial and commercial centre. Its location on the northwestern shore of Lake Ontario, which forms part of the border between Canada and the United States, and its access to Atlantic shipping via the St. Lawrence Seaway and to major U.S. industrial centres via the Great Lakes have enabled Toronto to become an important international trading centre. Moreover, the city is positioned on the edge of some of the best farmland in Canada, with a climate favourable to growing a wide range of crops, thereby making Toronto a transportation, distribution, and manufacturing centre. Most importantly, its central location, along with a host of political policies favouring international trade, places this city with the greatest economic ties to, and influence from, the United States." (McGillivray and Howard, 2020).

4.1 Toronto Population

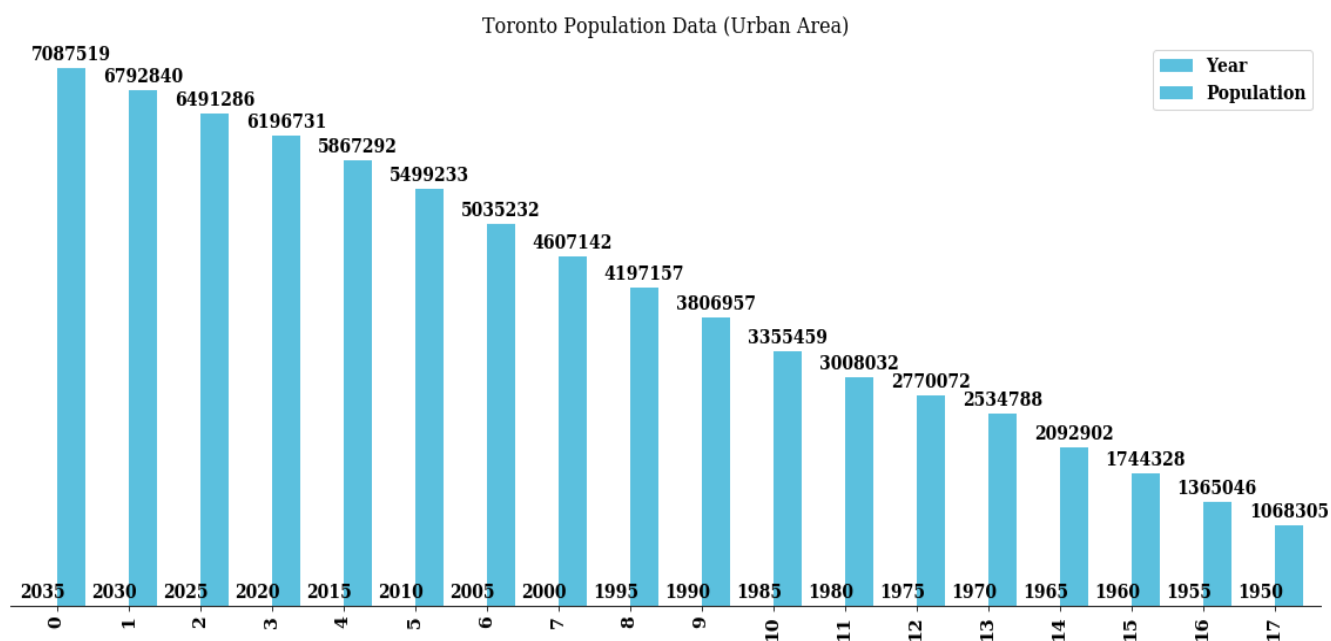
The following table shows the Toronto Population Data (Urban Area).

The data was retrieved from <https://worldpopulationreview.com/world-cities/toronto-population/>.

	Year	Population
0	2035	7087519
1	2030	6792840
2	2025	6491286
3	2020	6196731
4	2015	5867292
5	2010	5499233
6	2005	5035232
7	2000	4607142
8	1995	4197157
9	1990	3806957
10	1985	3355459
11	1980	3008032
12	1975	2770072
13	1970	2534788
14	1965	2092902
15	1960	1744328
16	1955	1365046
17	1950	1068305

4.2 Toronto Population's Bar Graph

For better visualization, a bar graph represents the data.



4.3 Toronto Immigration

According to The Canadian Magazine of Immigration, “Toronto had the largest foreign-born population of any census metropolitan area (CMA) in Canada (National Household Survey 2011).

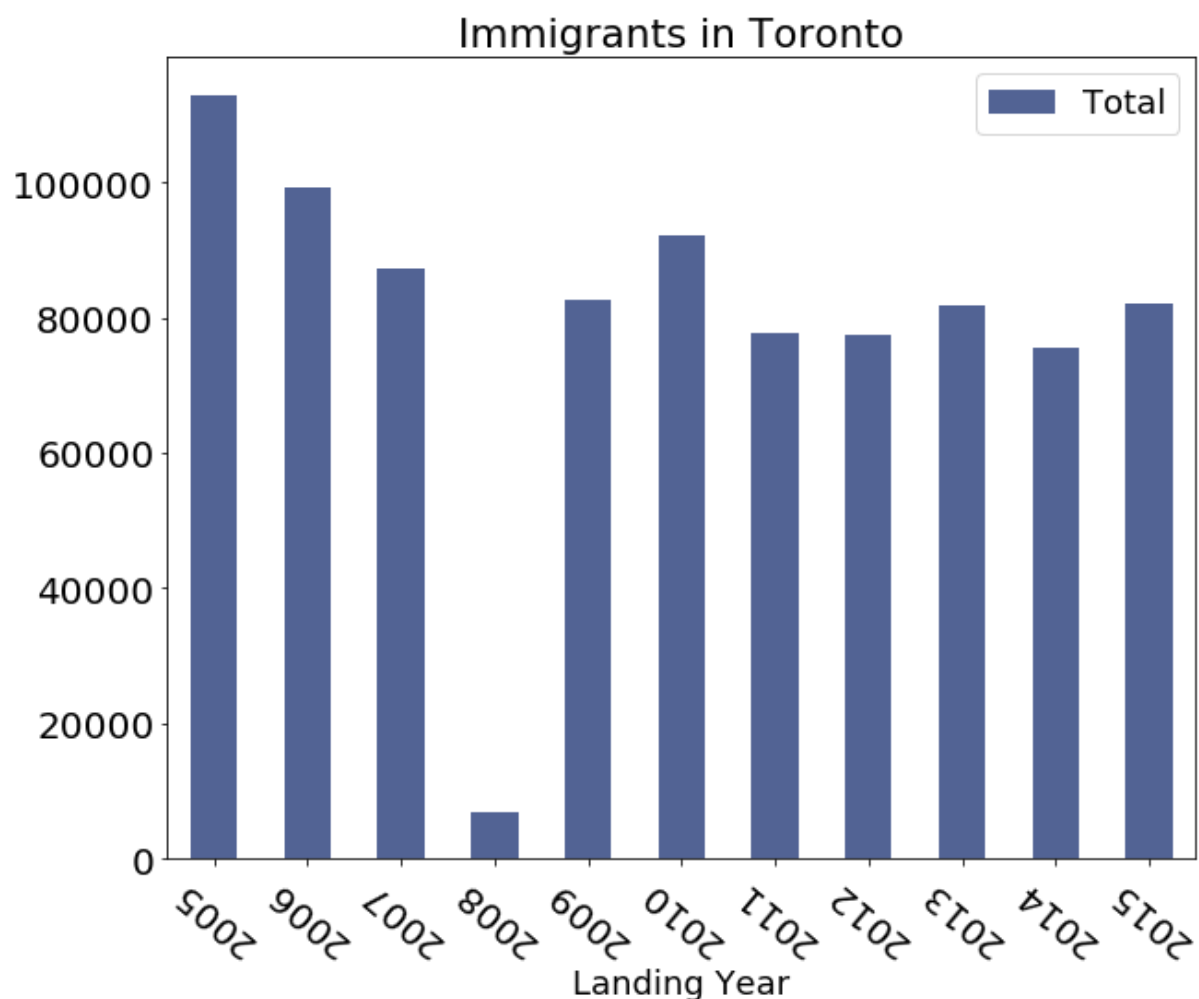
A total of 2,537,410 foreign-born people accounted for 46% of Toronto’s population (almost 5 out of 10 people were immigrants), and they represented 20.1% of Ontario’s population.

In 2011, Indian, Chinese and Filipinos were the largest groups of Toronto’s foreign-born population. Other top source countries of immigration were Italy, United Kingdom, Sri Lanka, Hong Kong, Pakistan, Jamaica, Portugal, Guyana, Poland, Iran, Viet Nam and the United States. All together represented 66% of the foreign-born population in Toronto.

Trinidad and Tobago, South Korea, Russia, Ukraine and Greece were also in the top 20 sources of immigration to Toronto.” (THE CANADIAN MAGAZINE OF IMMIGRATION, 2016).

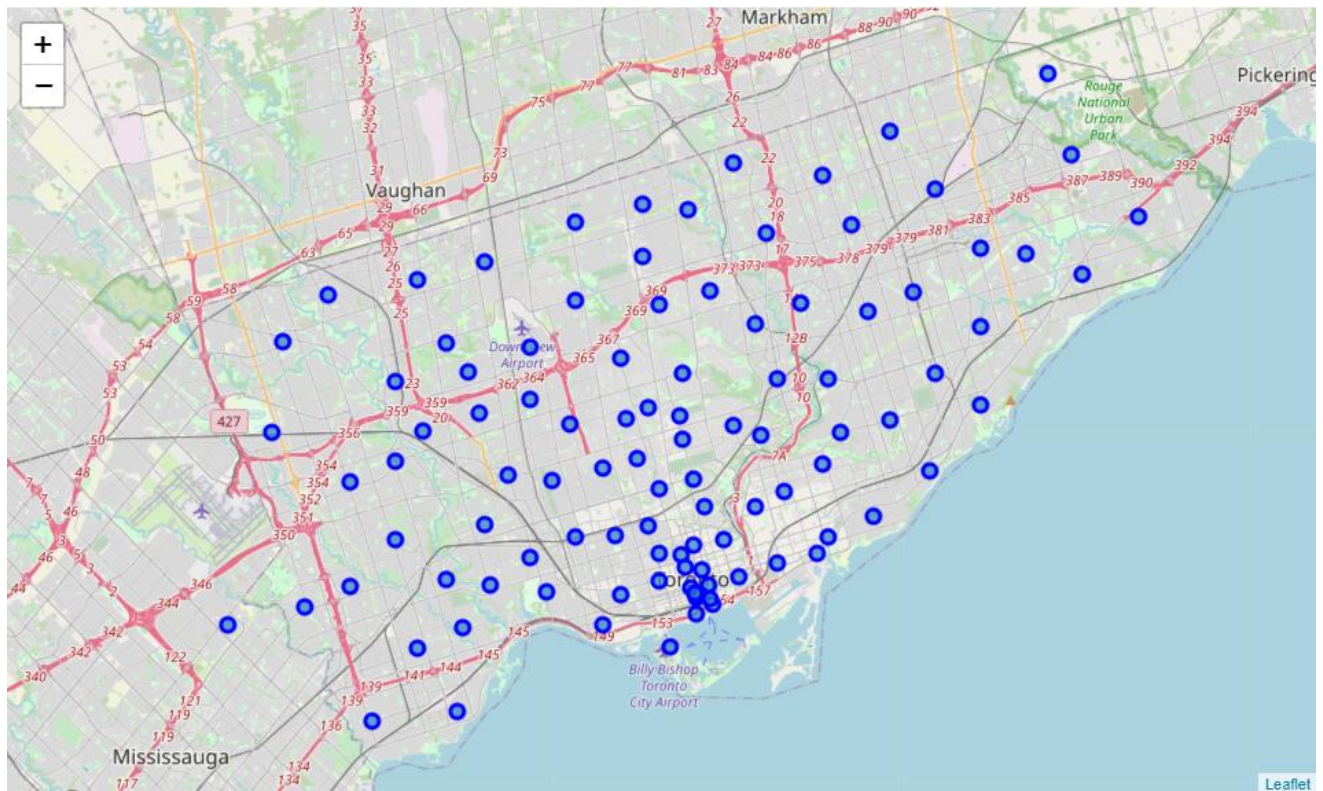
4.4 Toronto Immigration's Bar Graph

The information to populate the bar graph was retrieved from The Canadian Magazine of Immigration.



4.5 Map of Toronto

Folium was used to cluster the neighborhoods in the city of Toronto on an interactive leaflet map.

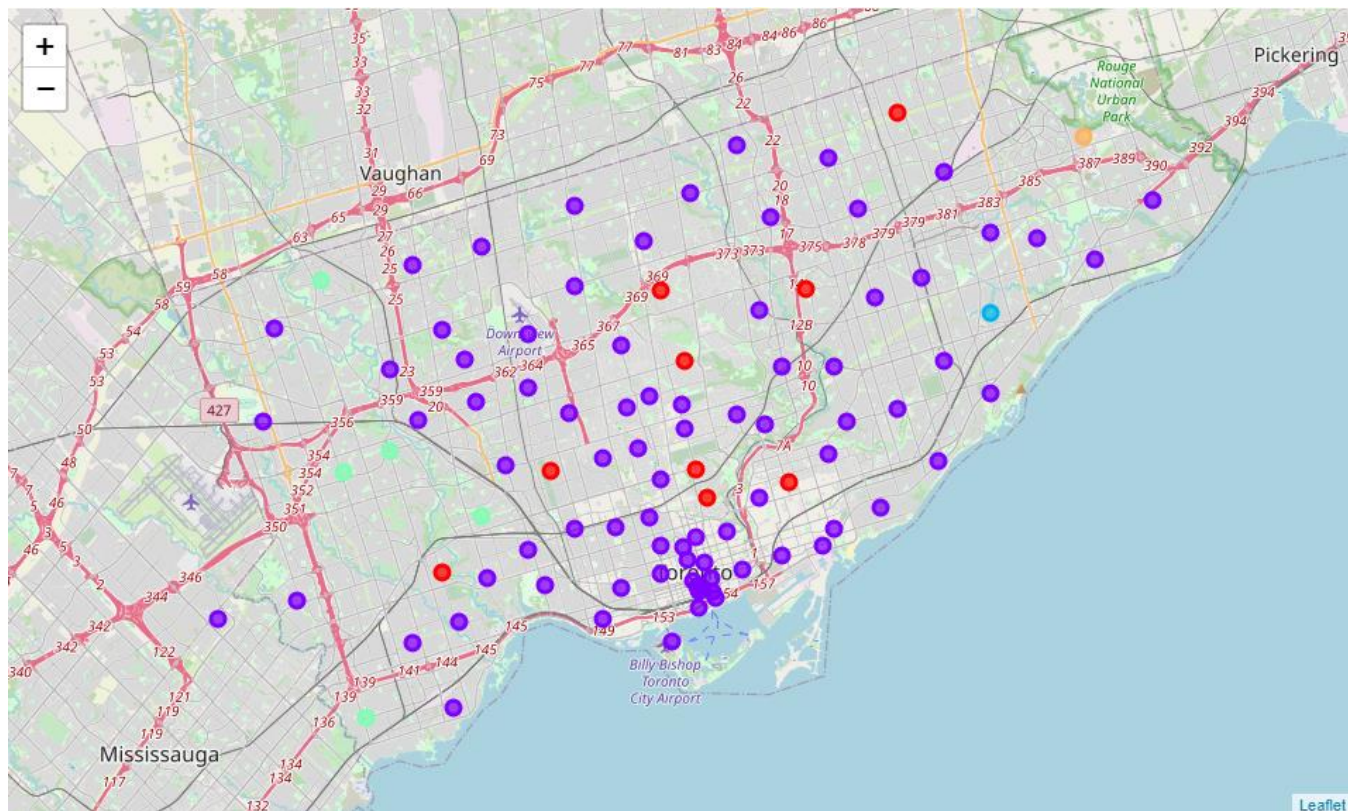


4.6 Foursquare

Foursquare in use to provide the most popular venues in each Neighborhood. The following table shows the Parkwoods, Victoria Village, Regent Park(Harbourfront), Lawrence Manor(Lawrence Heights), Queen's Park Ontario Provincial Government, Malvern Rouge, Don Mills, Parkview Hill (Woodbine Gardens), Garden District Ryerson, Glencairn neighborhoods and its most popular places. In this particular case, I needed to give the latitude, longitude, Foursquare ID, Foursquare secret, Foursquare IP version in order to retrieve the information.

Postal Code	Borough	Neighborhood	Latitude	Longitude	Cluster Labels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue
M3A	North York	Parkwoods	43.753259	-79.329656	0.0	Park	Food & Drink Shop	Department Store	Ethiopian Restaurant	Electronics Store
M4A	North York	Victoria Village	43.725882	-79.315572	1.0	Hockey Arena	Coffee Shop	French Restaurant	Portuguese Restaurant	Financial or Legal Service
M5A	Downtown Toronto	Regent Park, Harbourfront	43.654260	-79.360636	1.0	Coffee Shop	Bakery	Park	Breakfast Spot	Pub
M6A	North York	Lawrence Manor, Lawrence Heights	43.718518	-79.464763	1.0	Clothing Store	Women's Store	Coffee Shop	Boutique	Shoe Store
M7A	Downtown Toronto	Queen's Park, Ontario Provincial Government	43.662301	-79.389494	1.0	Coffee Shop	Diner	Yoga Studio	Park	Bar
M1B	Scarborough	Malvern, Rouge	43.806686	-79.194353	4.0	Fast Food Restaurant	Dessert Shop	Falafel Restaurant	Event Space	Ethiopian Restaurant
M3B	North York	Don Mills	43.745906	-79.352188	1.0	Gym	Beer Store	Restaurant	Japanese Restaurant	Coffee Shop
M4B	East York	Parkview Hill, Woodbine Gardens	43.706397	-79.309937	1.0	Pizza Place	Gym / Fitness Center	Bank	Café	Athletics & Sports
M5B	Downtown Toronto	Garden District, Ryerson	43.657162	-79.378937	1.0	Clothing Store	Coffee Shop	Japanese Restaurant	Italian Restaurant	Café
M6B	North York	Glencairn	43.709577	-79.445073	1.0	Park	Asian Restaurant	Japanese Restaurant	Pub	Department Store

4.7 Foursquare Map



5. New York City

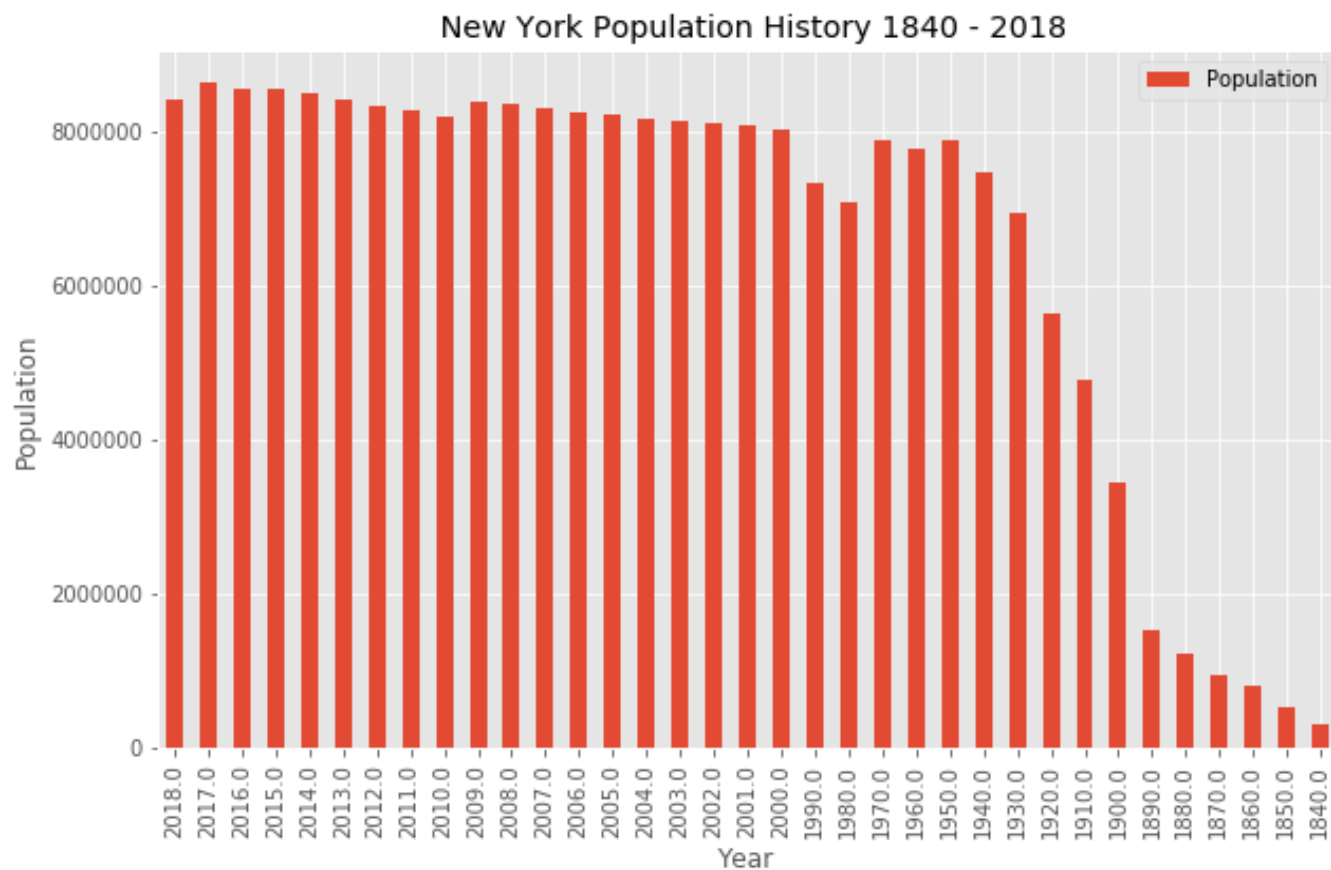
5.1 New York City Population

The following table shows the New York Population History from 1840 until 2018

The data was retrieved from <https://www.biggestuscities.com/city/new-york-new-york>.

	Year	Population
0	2018	8,398,748
1	2017	8,622,698
2	2016	8,537,673
3	2015	8,550,405
4	2014	8,491,079
5	2013	8,405,837
6	2012	8,336,697
7	2011	8,269,639
8	2010	8,175,133
9	2009	8,391,881
10	2008	8,346,794
11	2007	8,310,212
12	2006	8,250,567
13	2005	8,213,839
14	2004	8,169,940
15	2003	8,126,718
16	2002	8,092,749
17	2001	8,063,137
18	2000	8,015,348
19	1990	7,322,564
20	1980	7,071,639
21	1970	7,894,862
22	1960	7,781,984
23	1950	7,891,957
24	1940	7,454,995
25	1930	6,930,446
26	1920	5,620,048
27	1910	4,766,883
28	1900	3,437,202
29	1890	1,515,301
30	1880	1,206,299
31	1870	942,292
32	1860	813,669
33	1850	515,547
34	1840	312,710

5.2 New York City's Population Bar Graph

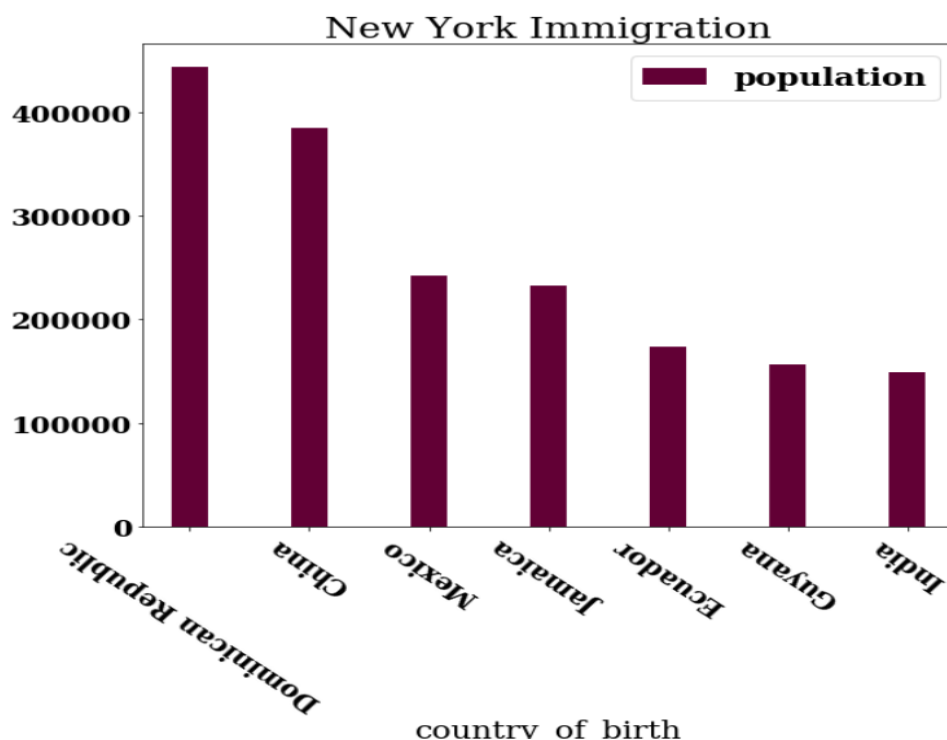


5.3 New York Immigration

The following bar graph shows the New York City Immigration.

The data was retrieved from

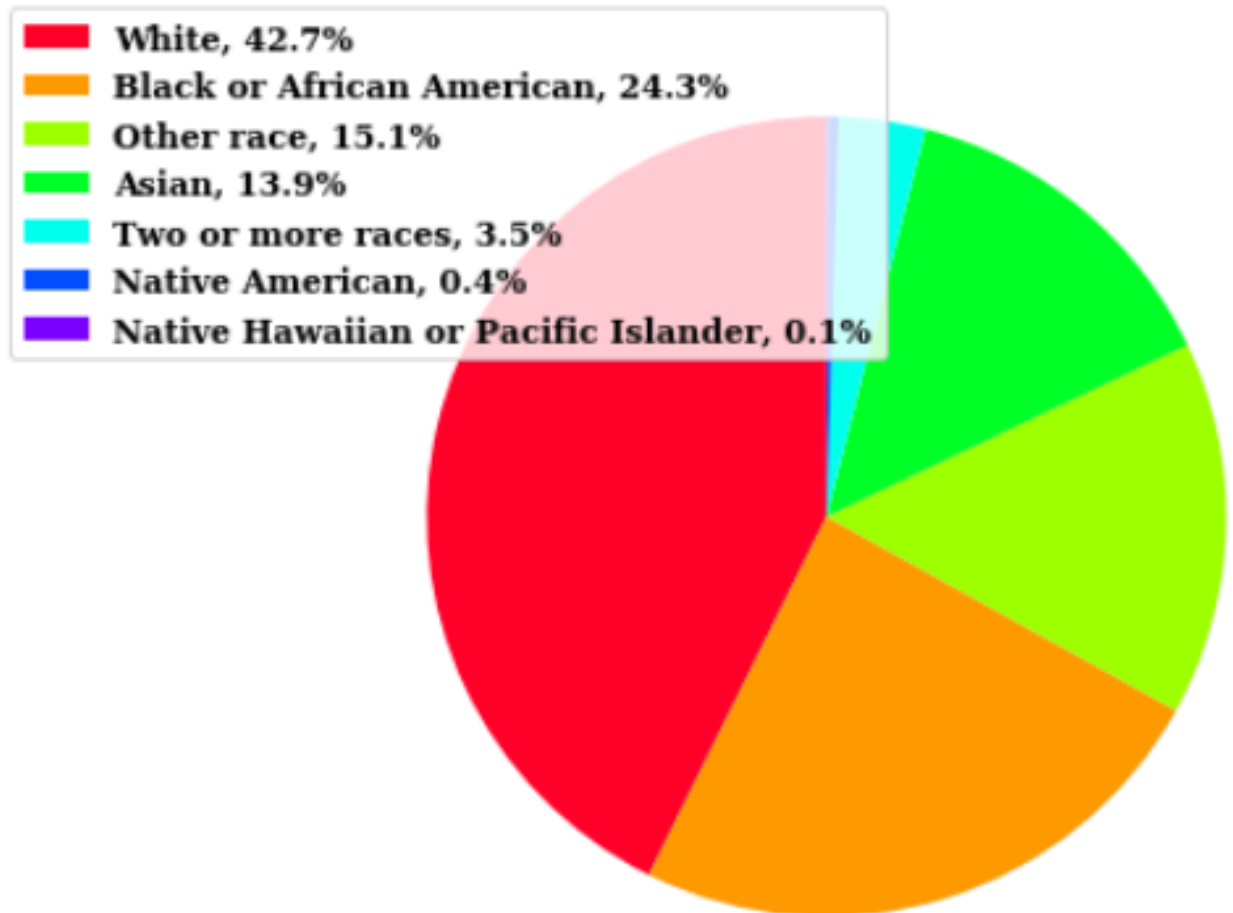
[https://en.wikipedia.org/wiki/Demographics_of_New_York_\(state\)](https://en.wikipedia.org/wiki/Demographics_of_New_York_(state)).



5.4 New York City's Population by Race

This pie chart shows the New York City Population by Race.

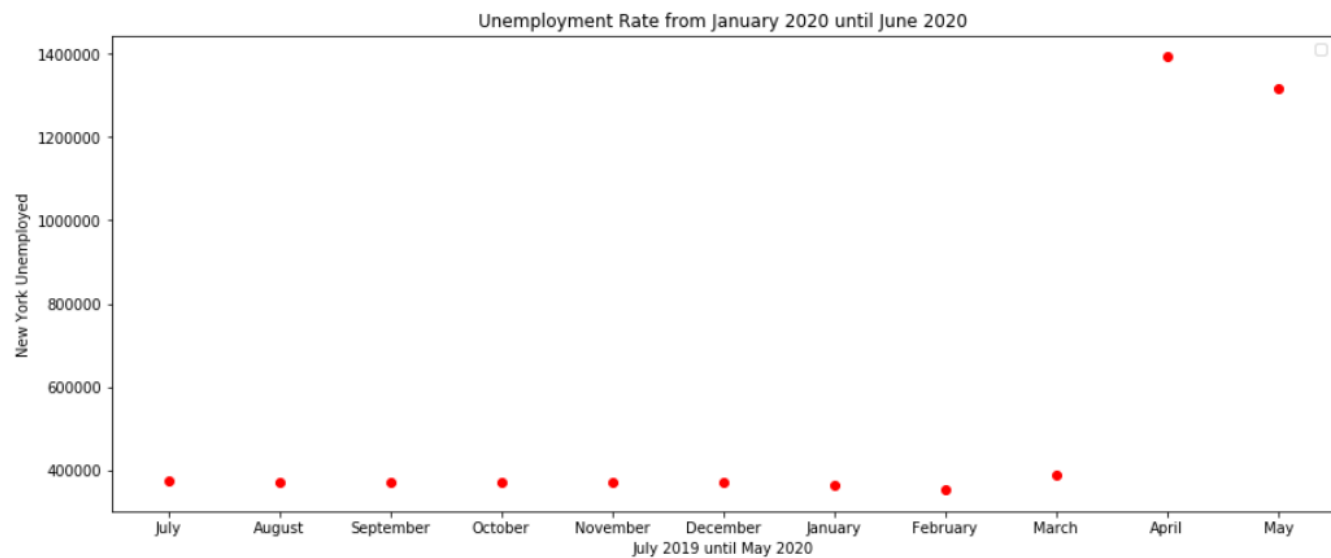
The data was retrieved from <https://worldpopulationreview.com/us-cities/new-york-city-ny-population>



5.5 New York City's Unemployment rate, From January 2019 until June 2020

The following graph represents New York City's unemployment rate from January 2019 until June 2020. An essential factor impacting New York City's unemployment rate in April and May was the coronavirus's pandemic. In this graph, we can see how coronavirus changed New York City job market.

According to the NY Daily News, "Unemployment in the Big Apple hit 18% last month — a nearly 3% increase when compared to the month prior — a new analysis released Friday by the City Comptroller found. [...] "The latest data on the city's unemployment situation is alarming and further underscores the urgent need for swift, robust federal support," Comptroller Scott Stringer said. "We need Washington to recognize the enormous scale of the losses we've suffered and get New York City the financial aid it needs." (Gartland, 2020)

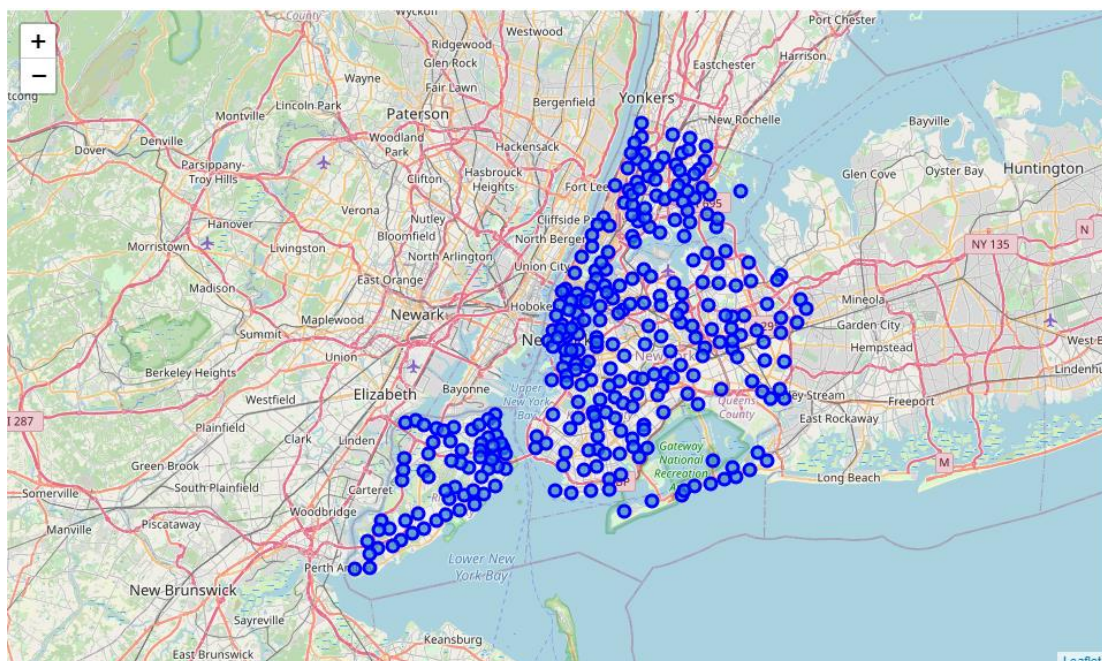


5.6 Map of New York City

According to Wikipedia, “The neighborhoods in New York City are located within the five boroughs of the City of New York. Their names and borders are not officially defined, and they change from time to time.

New York City is split up into five boroughs: the Bronx, Brooklyn, Manhattan, Queens, and Staten Island. Each borough has the same boundaries as a county of the state. The county governments were dissolved when the city consolidated in 1898, along with all city, town, and village governments within each county. The term borough was adopted to describe a unique form of governmental administration for each of the five fundamental constituent parts of the newly consolidated city.”

Folium was used to cluster the neighborhoods in the New York City on an interactive leaflet map.



6. Conclusion

In this report, several data were analyzed better to understand New York City and the city of Toronto. I identified, Toronto's population, Toronto's immigration, provided a map to cluster the neighborhoods in the city of Toronto, presented the five most famous venues of ten areas in Toronto and displayed a map using the Foursquare API.

Also, I identified, New York City's population, New York City's immigration, New York City's population by race, New York City's unemployment rate (from January 2019 until June 2020), and provided a map to cluster the neighborhoods in the city of New York.

7. Works Cited

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