



Finding the most  
similar neighbourhoods  
between Toronto and  
New York City

# Background and problem

- Recent study from the Fake Immigration Research Institute found a lot of migration from New York City to Toronto
- Potential opportunity: provide a recommendation service
- Project is to compare the venues of the two cities to find the most similar Toronto neighbourhood for each New York City neighbourhood

# Data sources

- New York University Spatial Data Repository  
([https://geo.nyu.edu/catalog/nyu\\_2451\\_34572](https://geo.nyu.edu/catalog/nyu_2451_34572))
- Wikipedia page of Canadian postal codes starting with M  
([https://en.wikipedia.org/wiki/List\\_of\\_postal\\_codes\\_of\\_Canada:\\_M](https://en.wikipedia.org/wiki/List_of_postal_codes_of_Canada:_M))
- Toronto geospatial coordinates  
([https://cocl.us/Geospatial\\_data](https://cocl.us/Geospatial_data))
- Foursquare API  
(<https://api.foursquare.com/>)

# Methodology

- Imported the BeautifulSoup package and used it to scrape a list of Toronto postal codes, neighbourhoods and boroughs
- Cleansed the data set to remove empty neighbourhoods
- Downloaded the Toronto geographical coordinates and merged it with the postal codes

# Methodology

- Result of merging Toronto coordinates with the postal codes:

	PostalCode	Borough	Neighbourhood	Latitude	Longitude
0	M3A	North York	Parkwoods	43.753259	-79.329656
1	M4A	North York	Victoria Village	43.725882	-79.315572
2	M5A	Downtown Toronto	Regent Park, Harbourfront	43.654260	-79.360636
3	M6A	North York	Lawrence Manor, Lawrence Heights	43.718518	-79.464763
4	M7A	Downtown Toronto	Queen's Park, Ontario Provincial Government	43.662301	-79.389494

# Methodology

- Imported the Folium library
- Plotted the neighbourhoods of Toronto onto a map



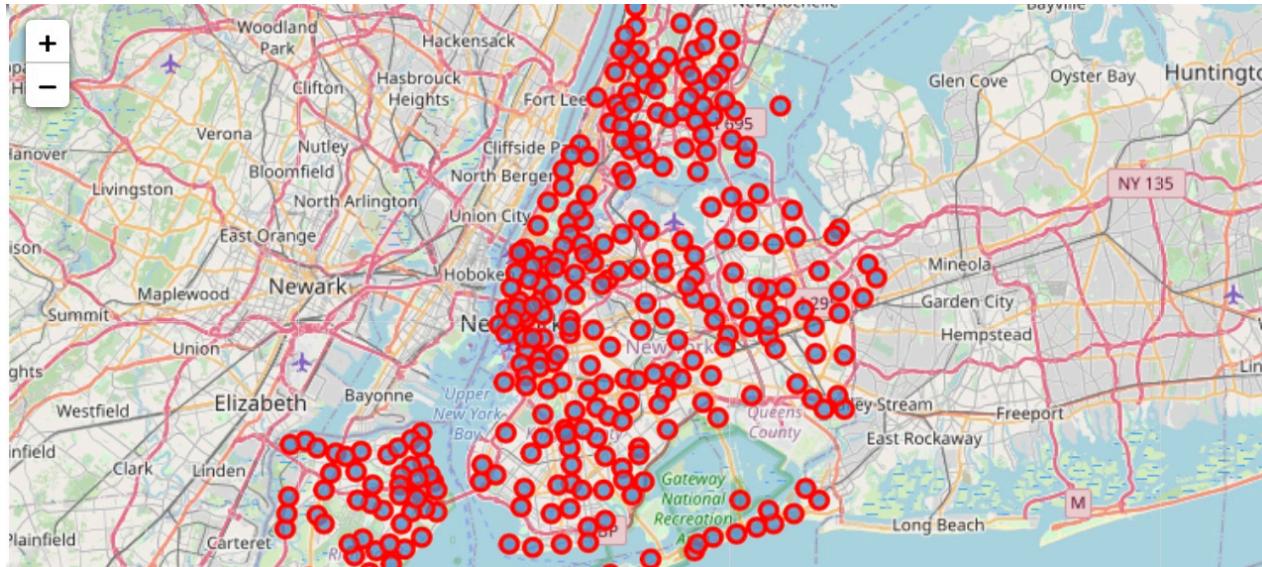
# Methodology

- Pulled a list of New York City neighbourhoods

	Borough	Neighbourhood	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

# Methodology

- Plotted the neighbourhoods of New York City onto a map



# Methodology

- Explored the neighbourhoods of Toronto using Foursquare API

# Methodology

- Explored the neighbourhoods of NYC using Foursquare API

	Neighbourhood	Accessories Store	Adult Boutique	Afghan Restaurant	African Restaurant	Airport Terminal	American Restaurant	Ant Shc
0	Allerton	0.0	0.0	0.0	0.0	0.0	0.000000	0.0
1	Annadale	0.0	0.0	0.0	0.0	0.0	0.181818	0.0
2	Arden Heights	0.0	0.0	0.0	0.0	0.0	0.000000	0.0
3	Arlington	0.0	0.0	0.0	0.0	0.0	0.000000	0.0
4	Arrochar	0.0	0.0	0.0	0.0	0.0	0.000000	0.0

# Methodology

- Normalized the venue information for both cities
- Found the Euclidean distances between each of New York's and Toronto's neighbourhoods

# Results

- Nearest Toronto neighbour for each New York City neighbourhood

	<b>NYC Neighbourhood</b>	<b>Closest Toronto Neighbourhood</b>
<b>0</b>	Allerton	St. James Town, Cabbagetown
<b>1</b>	Annadale	St. James Town, Cabbagetown
<b>2</b>	Arden Heights	Alderwood, Long Branch
<b>3</b>	Arlington	Stn A PO Boxes
<b>4</b>	Arrochar	Stn A PO Boxes
<b>5</b>	Arverne	Richmond, Adelaide, King
<b>6</b>	Astoria	Kensington Market, Chinatown, Grange Park
<b>7</b>	Astoria Heights	St. James Town, Cabbagetown
<b>8</b>	Auburndale	Stn A PO Boxes
<b>9</b>	Bath Beach	St. James Town, Cabbagetown
<b>10</b>	Battery Park City	Richmond, Adelaide, King
<b>11</b>	Bay Ridge	Kensington Market, Chinatown, Grange Park
<b>12</b>	Bay Terrace	Fairview, Henry Farm, Oriole

# Conclusion

- Built useful model to predict nearest Toronto neighbourhoods for each part of New York City
- Can serve as a recommendation engine for New Yorkers moving to Toronto

# Future directions

- Ideas for future work:
  - Using different distance metrics including Manhattan, Minkowski, and Hamming Distance
  - Allowing the user to limit the venue features they most care about