



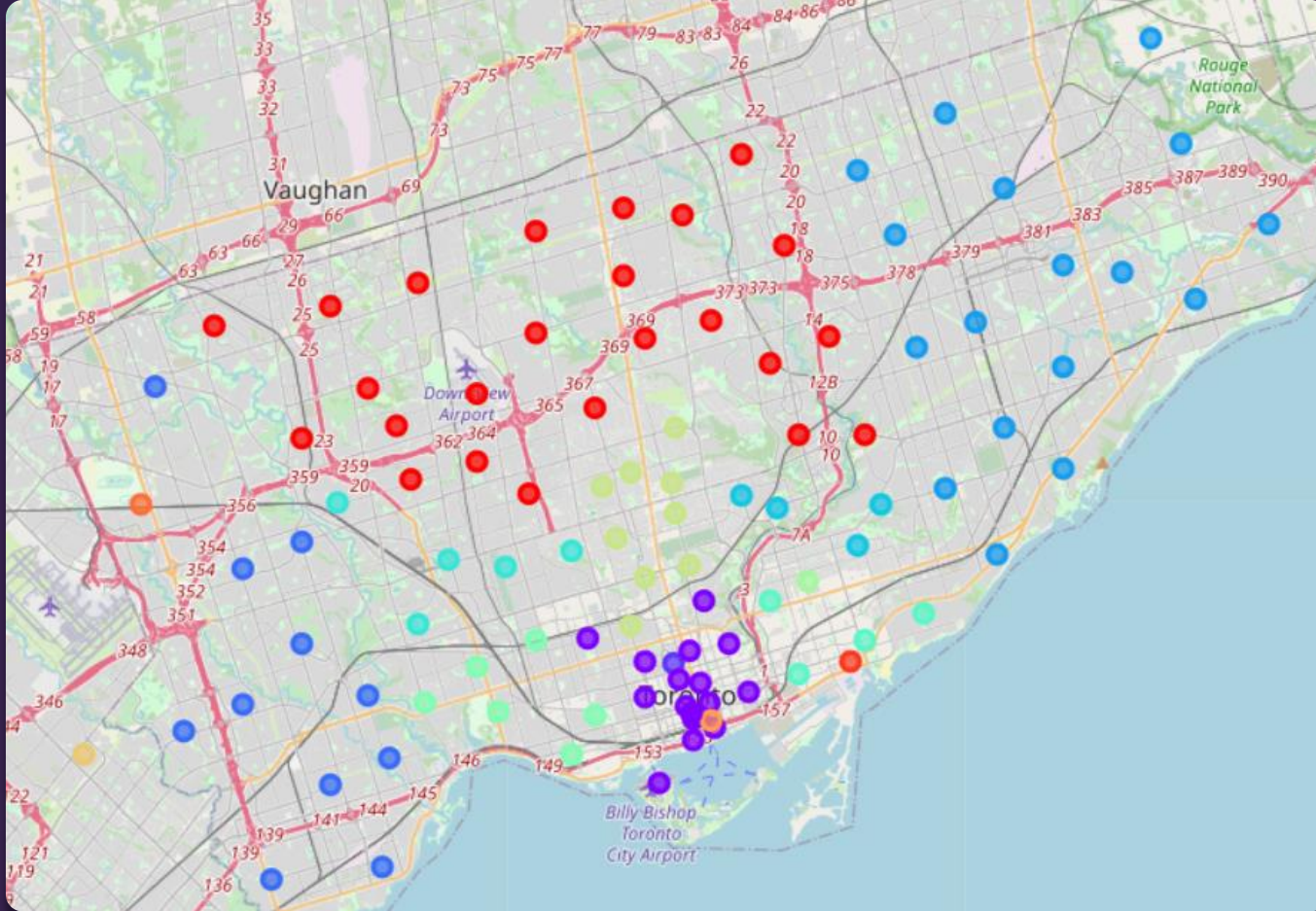
Content-Based Neighborhood Recommendation System

A recommendation system for neighborhoods may improve populace satisfaction

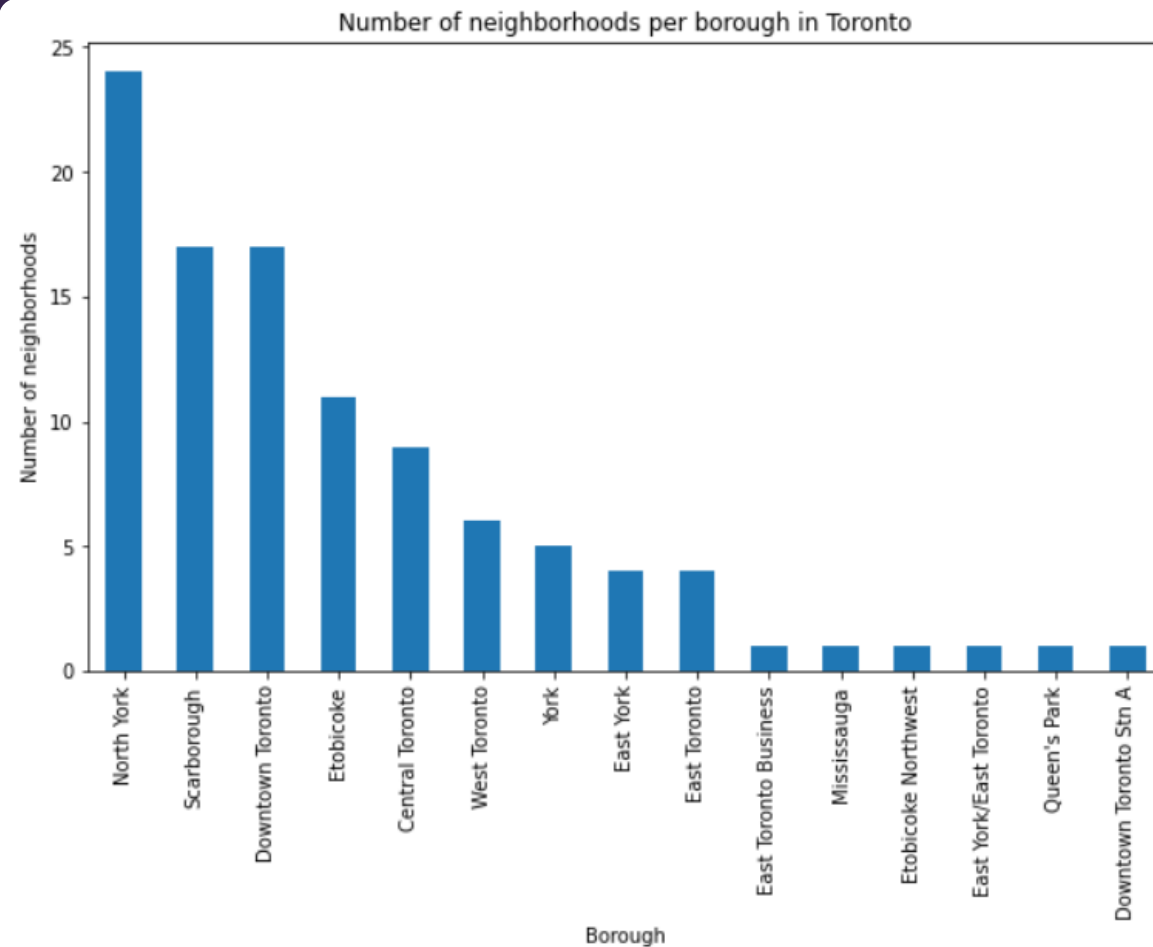
- ▶ Nowadays neighborhoods are an important factor that may raise or decrease the likelihood of a person/family to move to a specific place.
- ▶ Satisfaction has been repeatedly linked to efficiency and prosperity, helping people to find suitable neighborhoods can help improve the city.
- ▶ Overtime this may give valuable information of what venues drive customer satisfaction within a neighborhood.
- ▶ Real estate agents would be interested in the information this recommendation system will provide to narrow their search.
- ▶ Developing an app with this type of system that could also be economically interesting.

Data acquisition and cleaning

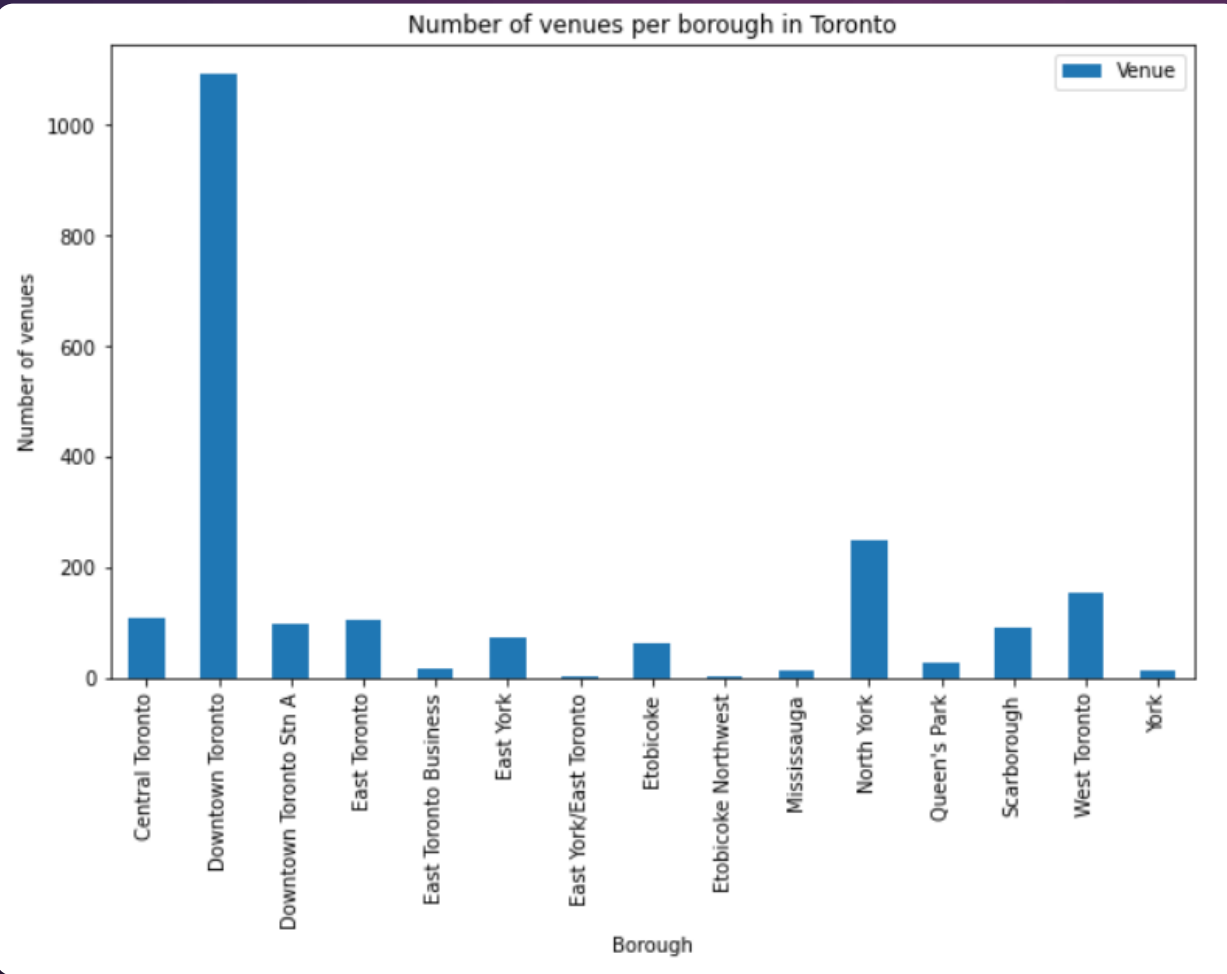
- ▶ To simplify matters this recommendation system will be constructed for the city of Toronto.
 - ▶ Boroughs and Neighborhood data was scrapped and parsed from https://en.wikipedia.org/wiki/List_of_postal_codes_of_Canada:_M.
 - ▶ Coordinates for each neighborhood were extracted from a .csv file.
 - ▶ After data cleaning, the data frame had 103 neighborhoods with 5 features.
 - ▶ Venue data was obtained using the Foursquare API



Neighborhoods
colored by
Borough in
Toronto



Neighborhood
distribution per
borough

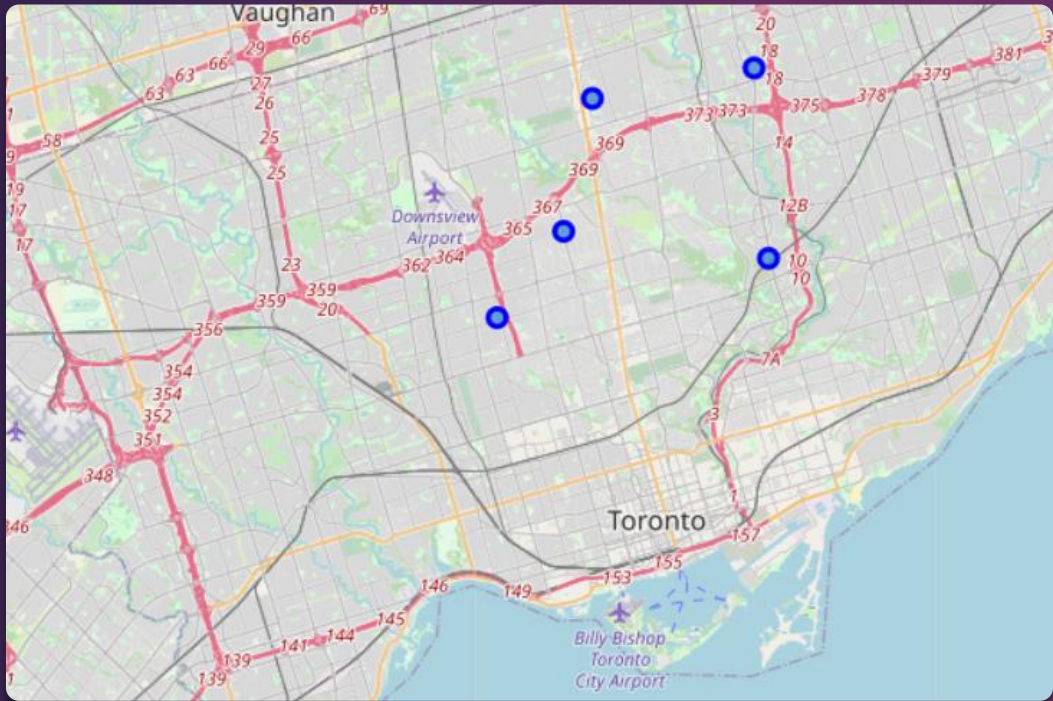


Comparison
between
Boroughs
regarding
the number
of venues

	Neighborhoods	Accessories Store	Adult Boutique	Airport	Airport Food Court	Airport Gate	Airport Lounge	Airport Service	Airport Terminal	American Restaurant	Antique Shop	Aquarium	Art Gallery	Art Museum	Arts & Crafts Store
0	Agincourt	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	Alderwood, Long Branch	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	Bathurst Manor, Wilson Heights, Downsview North	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	Bayview Village	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	Bedford Park, Lawrence Manor East	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0
5	Berczy Park	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0

	Neighborhood	rating
0	Caledonia-Fairbanks	5.0
1	Regent Park, Harbourfront	4.5

Defining
venue
features and
a user profile



Recommendations
in the Toronto map

Resulting recommendations with their weights

```
Neighborhoods
Fairview, Henry Farm, Oriole      0.421986
Willowdale South                  0.191489
Bedford Park, Lawrence Manor East 0.159574
Don Mills South                   0.127660
Glencairn                         0.099291
dtype: float64
```

- Although the content-based system recommendation successfully sorted the neighborhoods in North York by the user preferences, the weights are not very high

Conclusions

- ▶ The content-based recommendation system successfully gave the recommended neighborhoods in the targeted borough, but it is limited in giving high weighted user preferences for a neighborhood due to the large number of features.
- ▶ Future work can be done to refine this recommendation system. The options proposed to better the service consist in either use another recommendation system (collaborative filtering or maybe a hybrid) or asking the user for their preferred venues instead of the rating for their past neighborhoods.