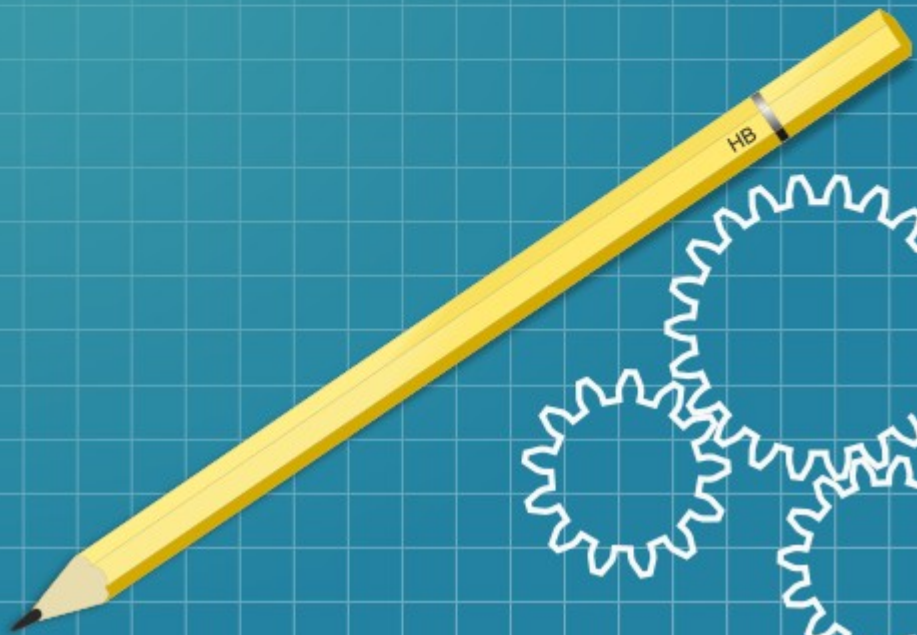
Bakeries
Data Analysis of Toronto



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Introduction - description & discussion of the background

In this project we will try to find an optimal location for a bakery in/around Downtown Toronto, Canada.

Because of the trendiness of bakeries in Toronto we will try to detect locations that are not already crowded with bakeries but yet as close to city centre as possible. Since bakeries have substitutes in the face of bagel shops, cupcake shops, delis and breakfast spots, we will add these to the map so that there might be areas with no bakery but with some of its substitutes.

Based on these criteria, we will use our data science prowess to generate a few promising streets and spots. Advantages of each area will then be clearly expressed for the purposes of finding the best possible final location which can be chosen by stakeholders.

When we consider all these problems, we can create a map and information chart where substitute are placed on the map and each central district is clustered according to the venue density.

Data

Based on our problem as defined above, factors that will influence our decision are:

- number of existing bakeries in/around the downtown area;
- number of existing substitute places – bagel shops, delis, etc.;
- distance to bakeries in the downtown area, if any distance from city centre;
- distance to sightseeings/crowded venues.

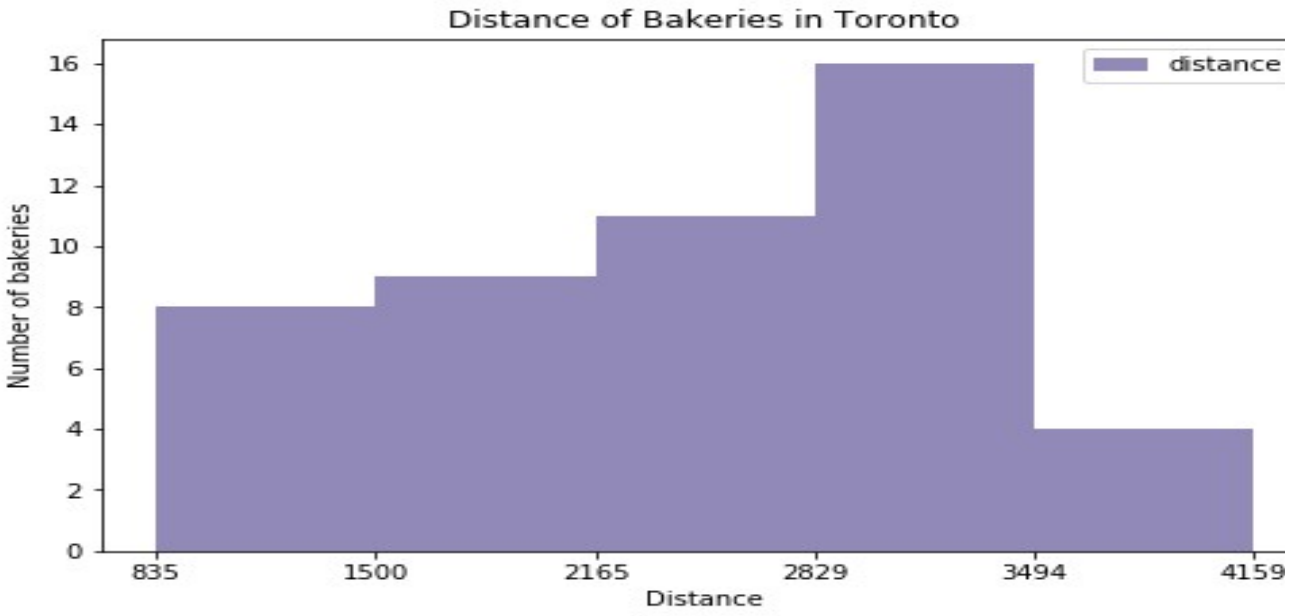
The number of bakeries and their type and location as well as sightseeings in and around Downtown Toronto will be obtained using Foursquare API.

Methodology

A folium map based on Foursquare API query with a limit of 200 for bagel shop, bakeries, cup cake shop and breakfast spots within a radius of 4 km to the centre and 49 results.

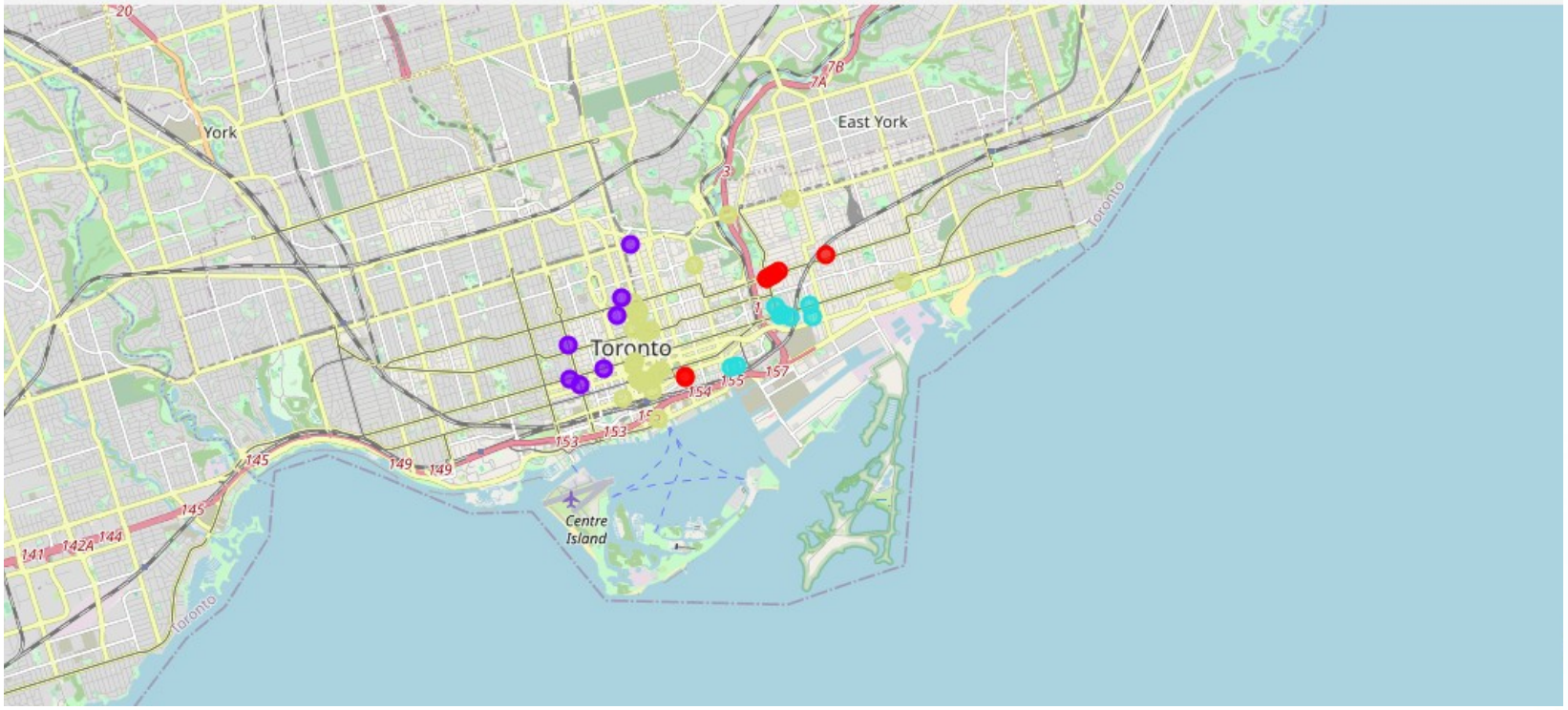
Methodology

Grouping bakeries and their substitutes by distance shows fewer bakeries and substitutes in the range of 835 m to 1500 m from Downtown Toronto and above 3494 m from downtown. These are possible areas for opening a new bakery.



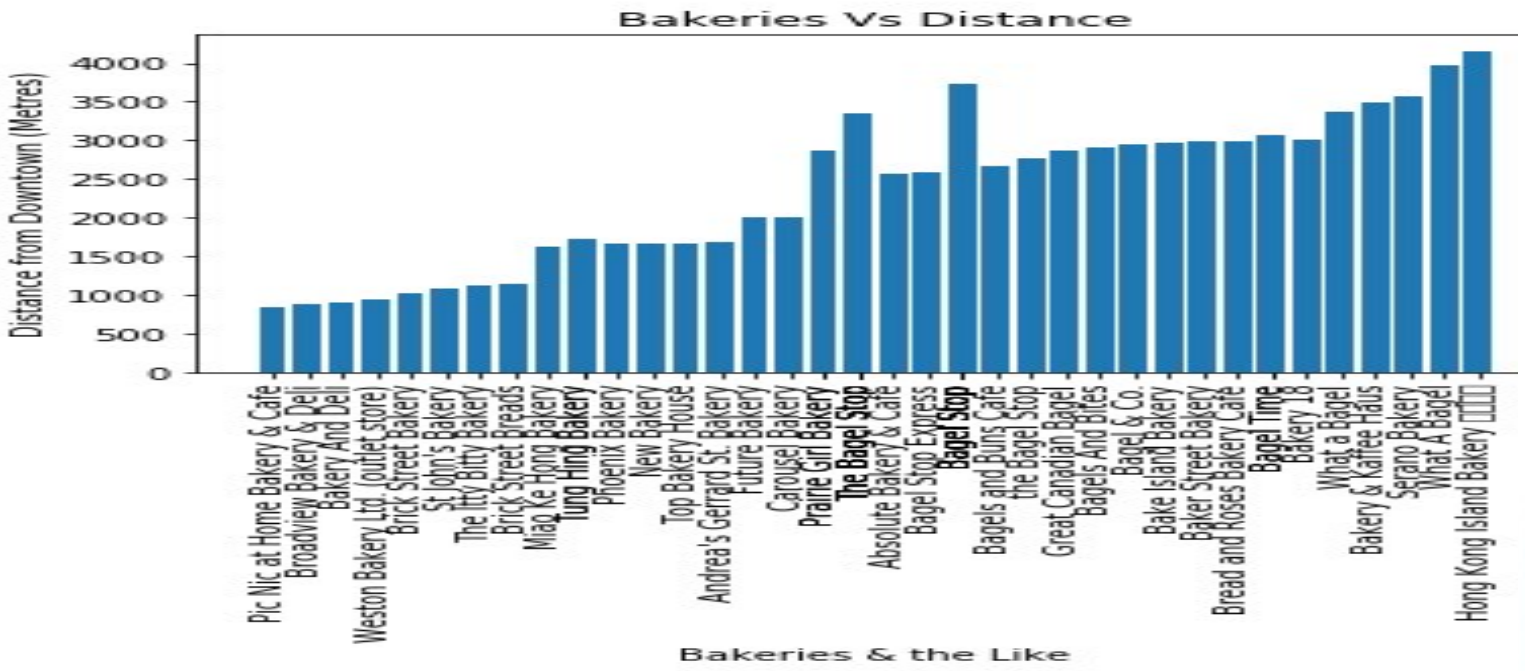
Methodology

4 clusters of bakeries thanks to the K-means algorithm, coloured differently in half circles around the downtown area.



Methodology

Average distance between bakeries and Downtown is 2434 metres.



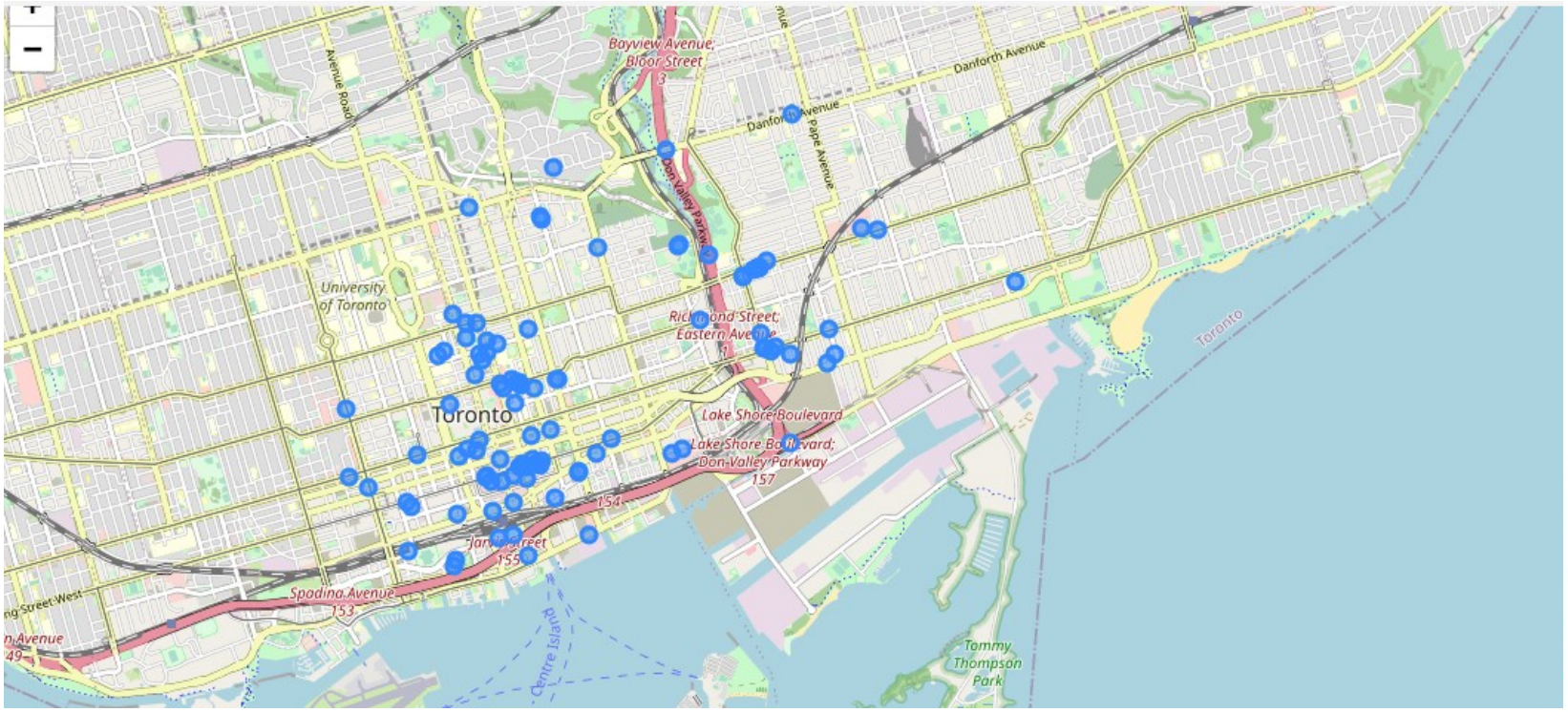
Methodology

The presence of attractive places in the surroundings lead to more passers-by and thus I searched for other venues using Foursquare API. The query included hotels and museums because they attract foreigners and visitors to the city. The query gave 49 results.

index	name	categories	address	distance	lat	lng	id
0	Hotel Pickles	None	100 booth ave	823	43.657784	-79.342712	4bd10ef0462cb71351bed907
1	Hotel Novotel Toronto Centre	Hotel	45 The Esplanade	2251	43.646530	-79.374250	4ad4c05bf964a520a0f520e3
2	Hotel Delilah	Bar	1036 Gerrard St E	2152	43.668949	-79.336825	5d2386a57dc742002349c5d1
3	Hotel Victoria	Hotel	56 Yonge St	2484	43.648084	-79.377582	4ad4c05cf964a520b4f520e3
4	Hotel Ocho	Hotel Bar	195 Spadina Ave.	3996	43.650000	-79.396609	4d6bf5ced47bb60cdb47a5aa
5	Hotel 22 Division	Hotel	78 Lombard	2243	43.652210	-79.374829	4e3b8d70ae604542364bf092
6	Hotel Le Germain Fitness Room	Gym / Fitness Center	75 Bremner	2719	43.643467	-79.379099	4f55877be4b072b51d61d81c
7	Rooftop At Broadview Hotel	Hotel Bar	106 Broadview Avenue	928	43.659109	-79.350074	59d40c3da9e40234d27cdc28
8	The Broadview Hotel	Hotel	106 Broadview Ave	921	43.659060	-79.350030	596186fd772fbc1671dff18b
9	One King West Hotel & Residence	Hotel	1 King St W	2495	43.649139	-79.377876	4af96fbbf964a520c01122e3
10	Textile Museum of Canada	Art Museum	55 Centre Avenue	3201	43.654396	-79.386500	4ad4c05ef964a520e2f620e3
11	Hotel X	Hotel	NaN	5595	43.632886	-79.411770	567415cc38fa3606432c2e5d
12	Sheraton Centre Toronto Hotel	Hotel	123 Queen Street West	3022	43.650594	-79.384530	4ab2d511f964a5209b6c20e3
13	Le Germain Hotel	Hotel	75 Bremner Boulevard	2870	43.643125	-79.380918	4cb87a334c60a093c04a39ca
14	Chelsea Hotel	Hotel	33 Gerrard Street West	3021	43.658498	-79.383097	51d212c3498ebf27dc469bc9
15	The Omni King Edward Hotel	Hotel	37 King Street East	2344	43.649191	-79.376006	4adf7d0bf964a520127b21e3

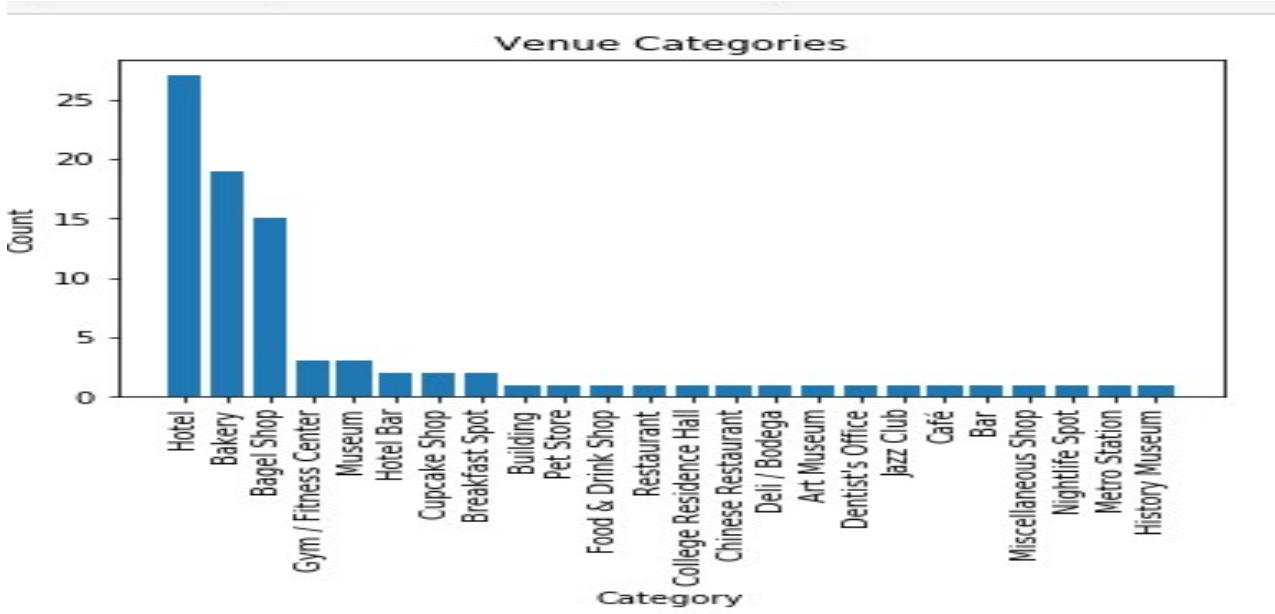
Methodology

The average distance and the median distance is about 2.5 km.



Methodology

Frequency analysis of a merged dataframe of bakeries and popular venues, such as hotels, museums shows that hotels and bakeries are at the top.



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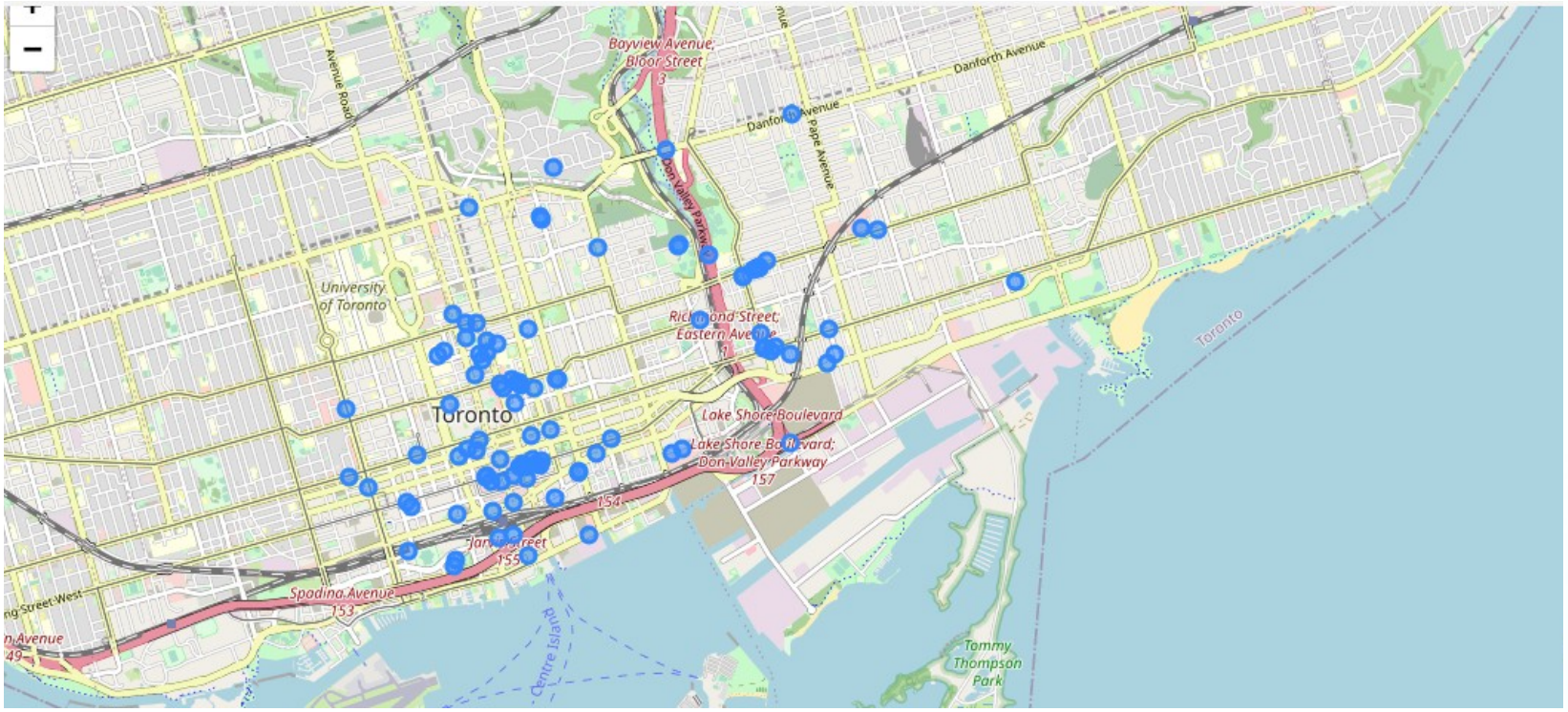
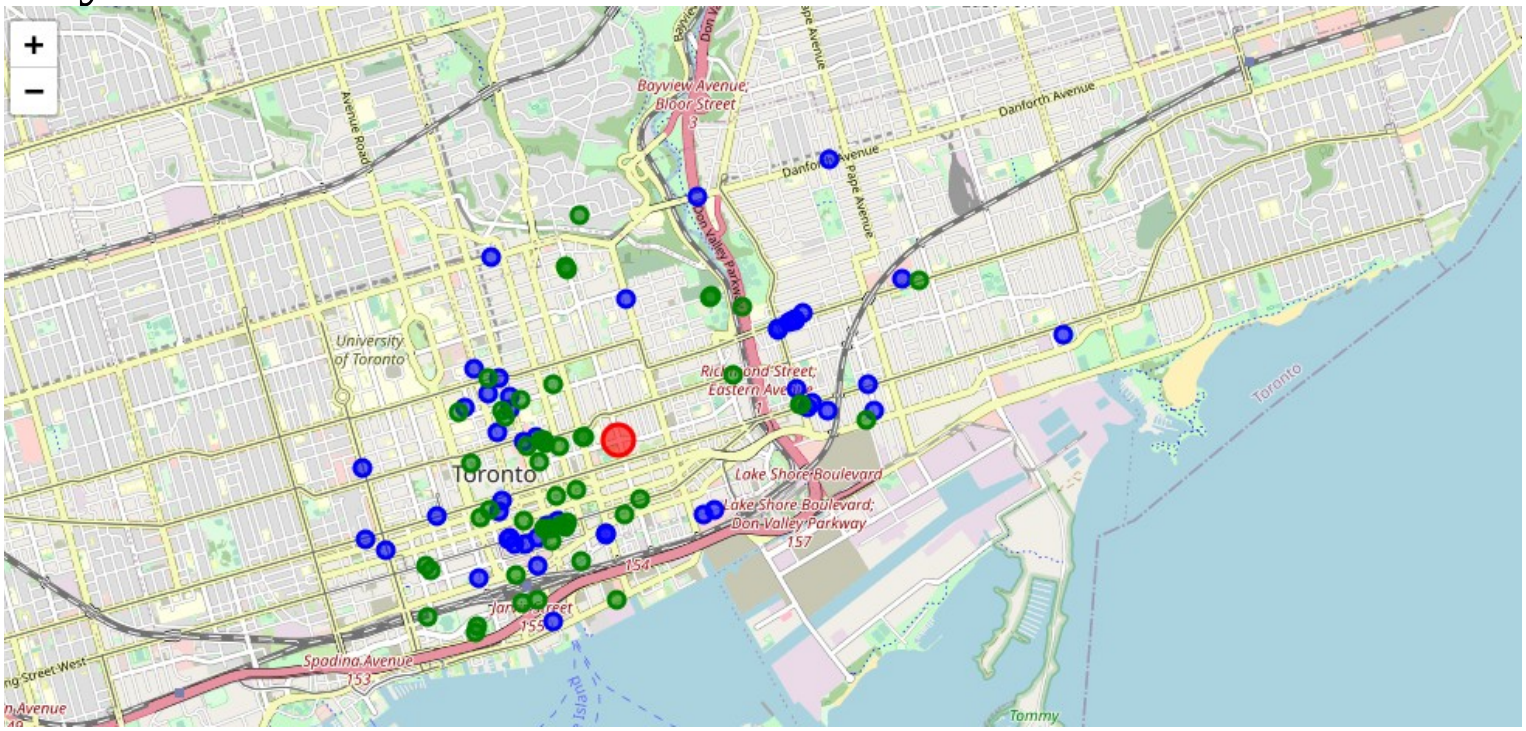


Results

To find the best location for a bakery, I took the midpoint of top ten closest among the venues and bakeries. The resulting latitude and longitude are at 43.65, -79.37, respectively. This is located at exact junction of Shuter St and Sherbourne St which is quite a central location, close to famous venues, such as the Old City Hall, CF Eaton Centre, Ryerson University and Grand Hotel.



Discussion

The maps and tables above give an idea why the predicted one is pointed/ clustered on the given spot.

KMeans shows the most common place for crowded and tourist venues, such as hotels and museums. At the same time this place is close to the downtown but not in the proximity of other bakeries or substitutes. Nevertheless some data is missing. There are venues which are not registered by Foursquare.

Conclusion

Kmeans as well as logic is in favour of places near the centre because they generate more interest and attract more passers-by and potential clients in their lunch breaks, on their way to home, on their way to attractions or on their holiday. Moreover, the place is not bustling with other bakeries so that competition is thought to be a little less of an issue.

Future Expectation:

More data to analyze would add more confidence to the results we obtained in this project.

Research on bakery reviews, their price range and specialties would be helpful in the future.