

Finding the right location to start the gym

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Business Problem

- Using the power of data science to find the right spot to open a gym at Toronto city.
- Finding the optimal location so that we can maximize the return on investment, which is based on the location, its popularity and nearby competitors.

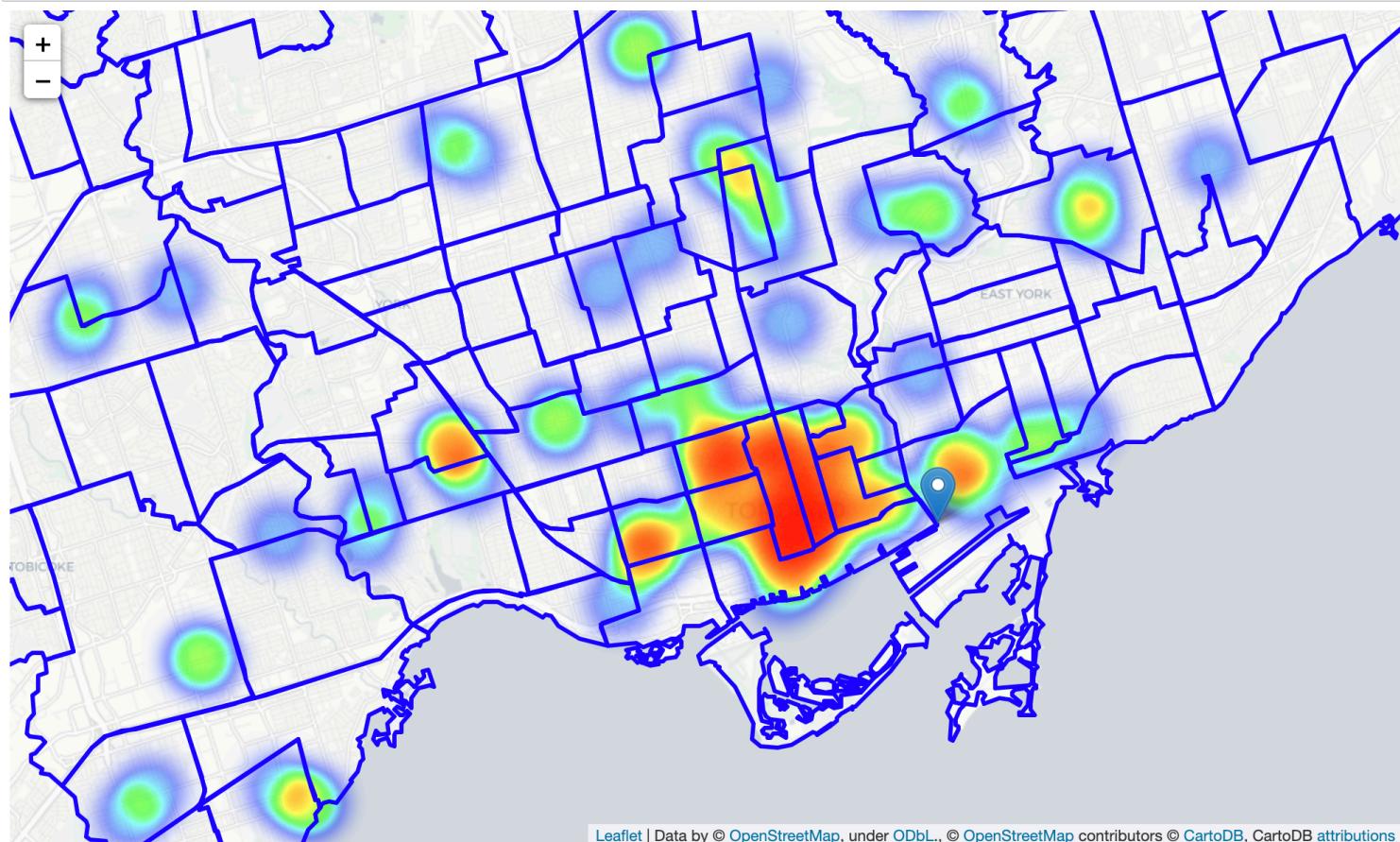
Data acquisition and cleaning

- Factors that will influence our decision are number of existing gyms and fitness centres in the neighborhood, popularity and population of the neighborhood and distance of neighborhood from Toronto downtown.
- Data sources will be Wikipedia and Four Square API.
- After getting the data from Foursquare API, we arrange the data in a data frame with columns Neighborhood, Venue, Venue Longitude, Venue Latitude, Venue Category, Venue Distance, Neighborhood latitude, Neighborhood longitude

Methodology

- Analysing will be calculation and exploration of gym / fitness centres density across different areas of Toronto - we will use heatmaps to identify a few promising areas close to center with low number of gyms / fitness centres in general and focus our attention on those areas.
- Focusing on most promising areas and within those create clusters of locations that have gyms / fitness centres (using k-means clustering)
- Analysing each cluster, neighborhood, and the number of gyms/fitness centres across each area and identify the right spot.

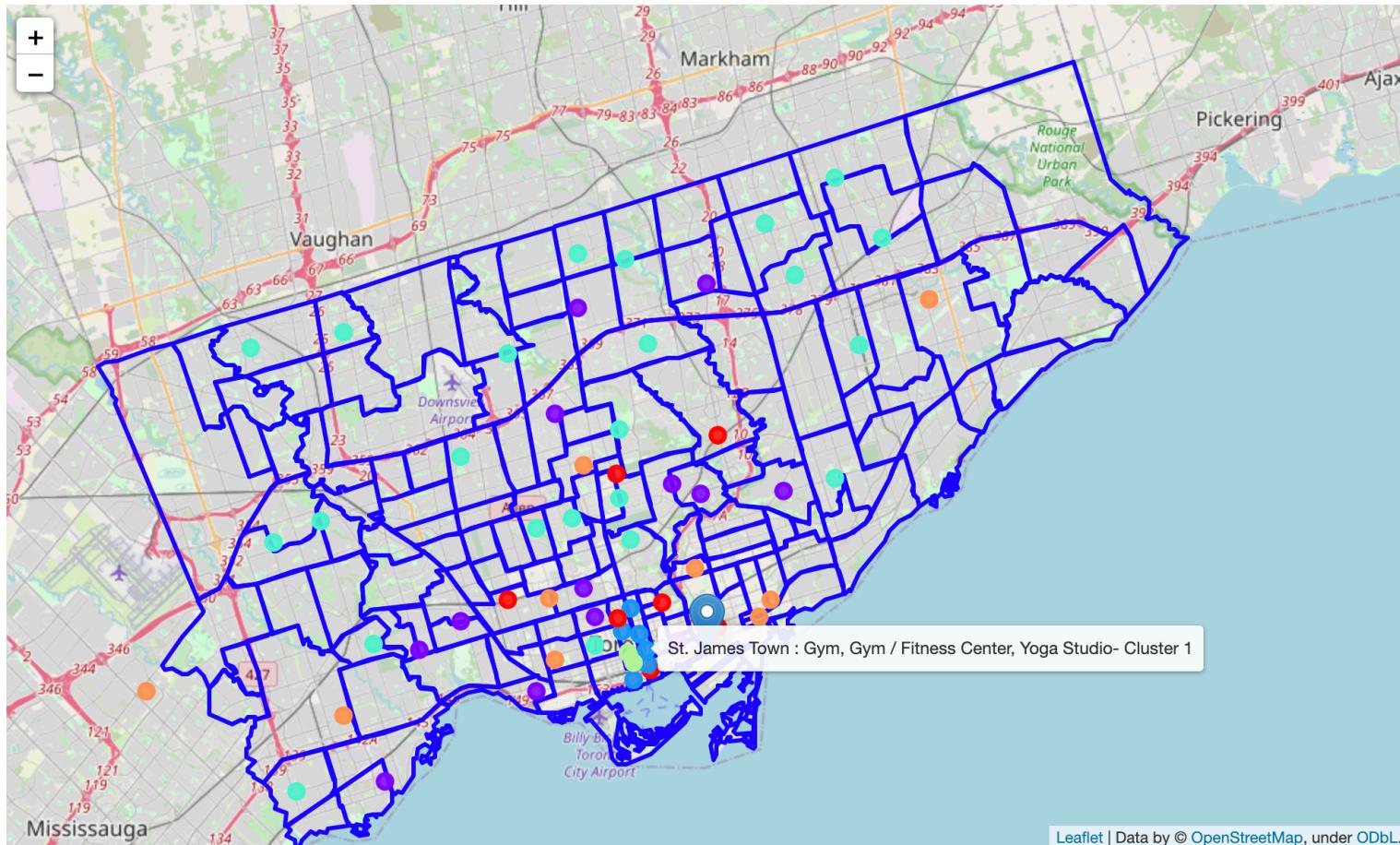
Heat Map showing venues of gym venues



Dataframe showing cluster labels and venue count

	Neighborhood	Neighborhood Latitude	Neighborhood Longitude	Gym Venues Count	Gym Venues	Cluster Labels
0	Agincourt	43.794200	-79.262029	3	Gym, Martial Arts School	2
1	Alderwood, Long Branch	43.602414	-79.543484	2	Gym, Gym / Fitness Center	2
2	Bathurst Manor, Wilson Heights, Downsview North	43.754328	-79.442259	1	Yoga Studio	2
3	Bayview Village	43.786947	-79.385975	1	Gym	2
4	Bedford Park, Lawrence Manor East	43.733283	-79.419750	4	Gym, Gym / Fitness Center, Gymnastics Gym, Yog...	0
5	Berczy Park	43.644771	-79.373306	7	Gym, Gym / Fitness Center, Gym Pool, Yoga Studio	5
6	Brockton, Parkdale Village, Exhibition Place	43.636847	-79.428191	6	Climbing Gym, Gym, Gym / Fitness Center, Yoga ...	0
7	Business reply mail Processing Centre, South C...	43.662744	-79.321558	4	Gym / Fitness Center, Martial Arts School, Yog...	4

Map that displays neighborhoods containing venues belonging to different clusters with count



Conclusion

- There are neighborhoods such as CN Tower, King and Spadina, Railway Lands, Harbourfront West, Bathurst Quay, South Niagara and Island airport inside the downtown that have no gym or any of the fitness centres.
- Opening a gym in any of these areas will give maximum return on investment since these neighborhoods are busy all the time with many offices and houses.