Toronto – Where to open a new Yoga Studio?

Coursera CapStone Project

People that practice yoga are conscious

So, the place should be calm...

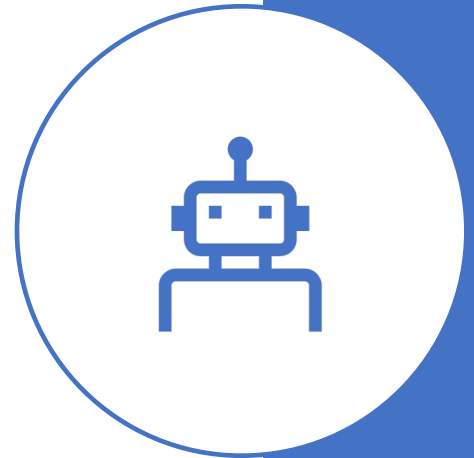It can be residential area.

Or may be a park by the sea?

Let's explore Toronto to find such a place!

What means we will use to analyze Toronto?

- List of neighborhoods downloaded from [Wikipedia's List of postal codes of Canada.](#)

- Geospatial coordinates available at http://cocl.us/Geospatial_data

- [Foursquare](#) social network to retrieve type and number of venues .

After combination of several databases we got a data frame to work with:

	Postal code	Borough	Neighborhood	Latitude	Longitude
0	M1B	Scarborough	Malvern, Rouge	43.806686	-79.194353
1	M1C	Scarborough	Rouge Hill, Port Union, Highland Creek	43.784535	-79.160497
2	M1E	Scarborough	Guildwood, Morningside, West Hill	43.763573	-79.188711
3	M1G	Scarborough	Woburn	43.770992	-79.216917
4	M1H	Scarborough	Cedarbrae	43.773136	-79.239476

Toronto Neighborhoods To Explore

Using sophisticated programming, we extract all the venues mentioned in Foursquare API…

	Neighborhood	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
0	Malvern, Rouge	43.806686	-79.194353	Wendy's	43.807448	-79.199056	Fast Food Restaurant
1	Rouge Hill, Port Union, Highland Creek	43.784535	-79.160497	Royal Canadian Legion	43.782533	-79.163085	Bar
2	Guildwood, Morningside, West Hill	43.763573	-79.188711	RBC Royal Bank	43.766790	-79.191151	Bank
3	Guildwood, Morningside, West Hill	43.763573	-79.188711	G & G Electronics	43.765309	-79.191537	Electronics Store
4	Guildwood, Morningside, West Hill	43.763573	-79.188711	Big Bite Burrito	43.766299	-79.190720	Mexican Restaurant

We will analyze 'Venue Category " to find neighborhoods with or without Yoga Studio

Venue Category

Fast Food Restaurant

Bar

Bank

Electronics Store

Mexican Restaurant

Neighborhoods to Avoid:

Yoga Studios are already there!

- 'Thorncliffe Park',
- 'The Danforth West, Riverdale',
- 'Studio District',
- 'North Toronto West',
- 'Church and Wellesley',
- 'Regent Park, Harbourfront',
- 'Central Bay Street',
- 'University of Toronto, Harbord',
- 'Stn A PO Boxes',
- 'Little Portugal, Trinity',
- 'Runnymede, Swansea',
- "Queen's Park, Ontario Provincial Government",
- 'Business reply mail Processing CentrE'
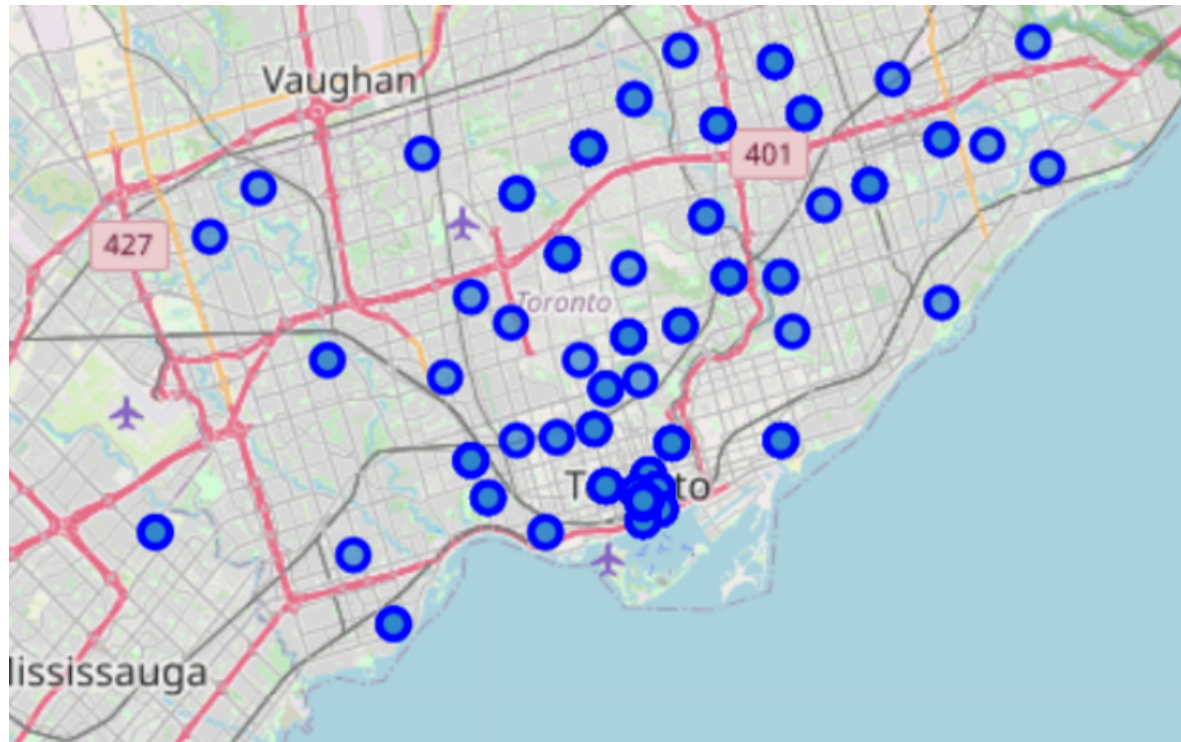
But there are still 82 neighborhoods without Yoga Studio!

Things to do:

Select neighborhoods with restaurants

Cluster neighborhoods according to restaurant frequency

Choose calm neighborhoods

Clustering neighborhoods with K-Means reveals neighborhoods crowded with restaurants:

Neighborhood Cluster/Venues Heatmap

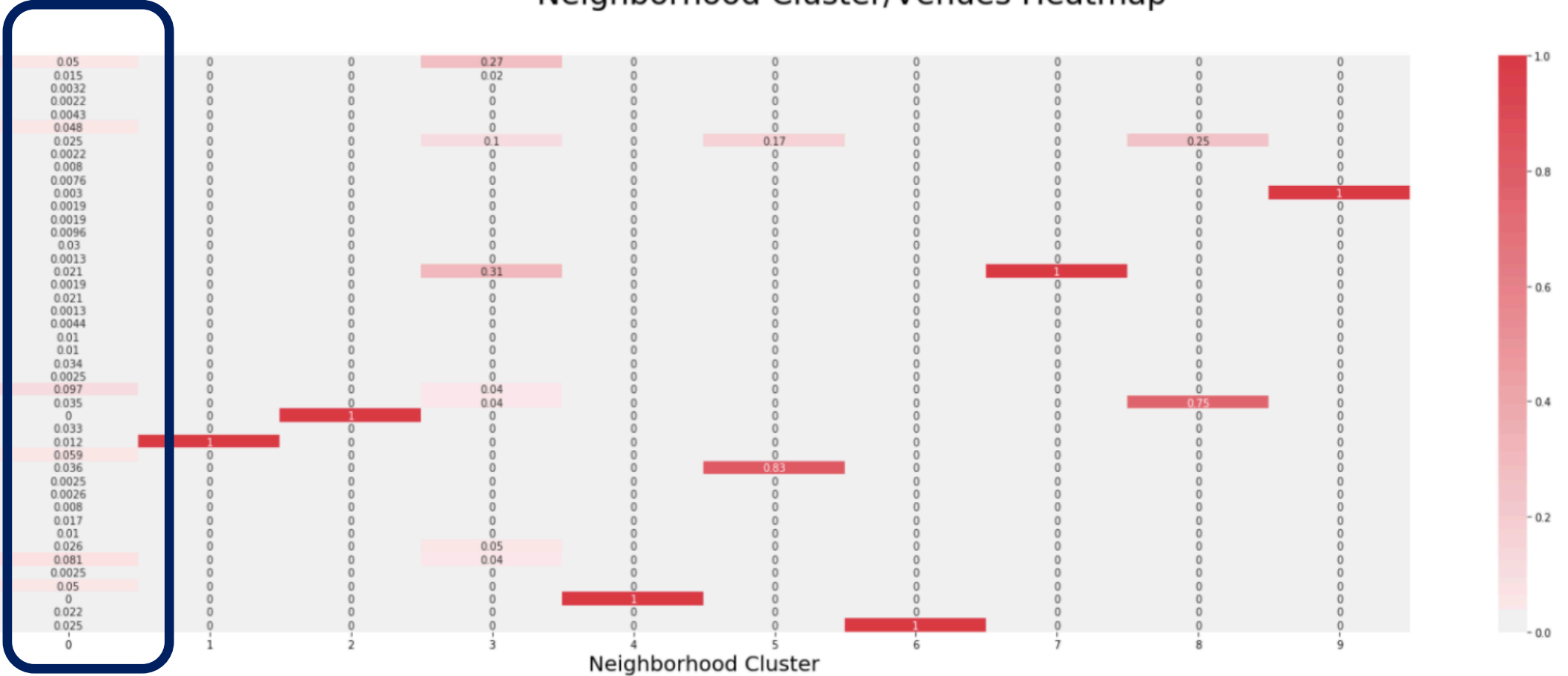| Type of the venue	0	1	2	3	4	5	6	7	8	9
American Restaurant	0.05	0	0	0.27	0	0	0	0	0	0
Asian Restaurant	0.015	0	0	0.02	0	0	0	0	0	0
Belgian Restaurant	0.0032	0	0	0	0	0	0	0	0	0
Brazilian Restaurant	0.0022	0	0	0	0	0	0	0	0	0
Cajun / Creole Restaurant	0.0043	0	0	0	0	0	0	0	0	0
Caribbean Restaurant	0.048	0	0	0	0	0	0	0	0	0
Chinese Restaurant	0.025	0	0	0.1	0	0.17	0	0	0.25	0
Colombian Restaurant	0.0022	0	0	0	0	0	0	0	0	0
Comfort Food Restaurant	0.008	0	0	0	0	0	0	0	0	0
Cuban Restaurant	0.0076	0	0	0	0	0	0	0	0	0
Dim Sum Restaurant	0.003	0	0	0	0	0	0.003	0	0	1
Doner Restaurant	0.0019	0	0	0	0	0	0	0	0	0
Dumpling Restaurant	0.0019	0	0	0	0	0	0	0	0	0
Eastern European Restaurant	0.0096	0	0	0	0	0	0.0096	0	0	0
Empanada Restaurant	0.03	0	0	0	0	0	0	0	0	0
Ethiopian Restaurant	0.0013	0	0	0	0	0	0	0	0	0
Fast Food Restaurant	0.021	0	0	0.31	0	0	0.021	1	0	0
Filipino Restaurant	0.0019	0	0	0	0	0	0	0	0	0
French Restaurant	0.021	0	0	0	0	0	0.021	0	0	0
German Restaurant	0.0013	0	0	0	0	0	0	0	0	0
Gluten-free Restaurant	0.0044	0	0	0	0	0	0	0	0	0
Greek Restaurant	0.01	0	0	0	0	0	0.01	0	0	0
Hakka Restaurant	0.01	0	0	0	0	0	0	0	0	0
Indian Restaurant	0.034	0	0	0	0	0	0	0	0	0
Indonesian Restaurant	0.0025	0	0	0	0	0	0	0	0	0
Italian Restaurant	0.097	0	0	0.04	0	0	0	0	0	0
Japanese Restaurant	0.035	0	0	0.04	0	0	0	0	0.75	0
Korean Restaurant	0	0	1	0	0	0	0	0	0	0
Latin American Restaurant	0.033	0	0	0	0	0	0	0	0	0
Mediterranean Restaurant	0.012	1	0	0	0	0	0.012	0	0	0
Mexican Restaurant	0.059	0	0	0	0	0	0	0	0	0
Middle Eastern Restaurant	0.036	0	0	0	0	0.83	0.036	0	0	0
Modern European Restaurant	0.0025	0	0	0	0	0	0	0	0	0
Moroccan Restaurant	0.0026	0	0	0	0	0	0.0026	0	0	0
New American Restaurant	0.008	0	0	0	0	0	0	0	0	0
Portuguese Restaurant	0.017	0	0	0	0	0	0	0	0	0
Ramen Restaurant	0.01	0	0	0	0	0	0.01	0	0	0
Seafood Restaurant	0.026	0	0	0.05	0	0	0.026	0	0	0
Sushi Restaurant	0.081	0	0	0.04	0	0	0	0	0	0
Taiwanese Restaurant	0.0025	0	0	0	0	0	0.0025	0	0	0
Thai Restaurant	0.05	0	0	0	0	0	0	0	0	0
Turkish Restaurant	0	0	0	0	1	0	0	0	0	0
Vegetarian / Vegan Restaurant	0.022	0	0	0	0	0	0	0	0	0
Vietnamese Restaurant	0.025	0	0	0	0	0	1	0	0	0

Neighborhood Cluster

We remove neighborhoods in cluster 0, they are too noisy…

Here is the list of neighborhoods to consider:

Bayview Village	Cliffside, Cliffcrest, Scarborough Village West	Del Ray, Mount Dennis, Keelsdale and Silverthorn	Dufferin, Dovercourt Village 4 Fairview, Henry Farm, Oriole	Glencairn	Hillcrest Village
India Bazaar, The Beaches West	Lawrence Manor, Lawrence Heights	Lawrence Park	Malvern, Rouge	Mimico NW, The Queensway West, South of Bloor	New Toronto, Mimico South, Humber Bay Shores
Parkview Hill, Woodbine Gardens	South Steeles, Silverstone, Humbergate, Jamest	Steeles West, L'Amoreaux West	Westmount	Wexford, Maryvale	Woburn

Analysis of venues around:
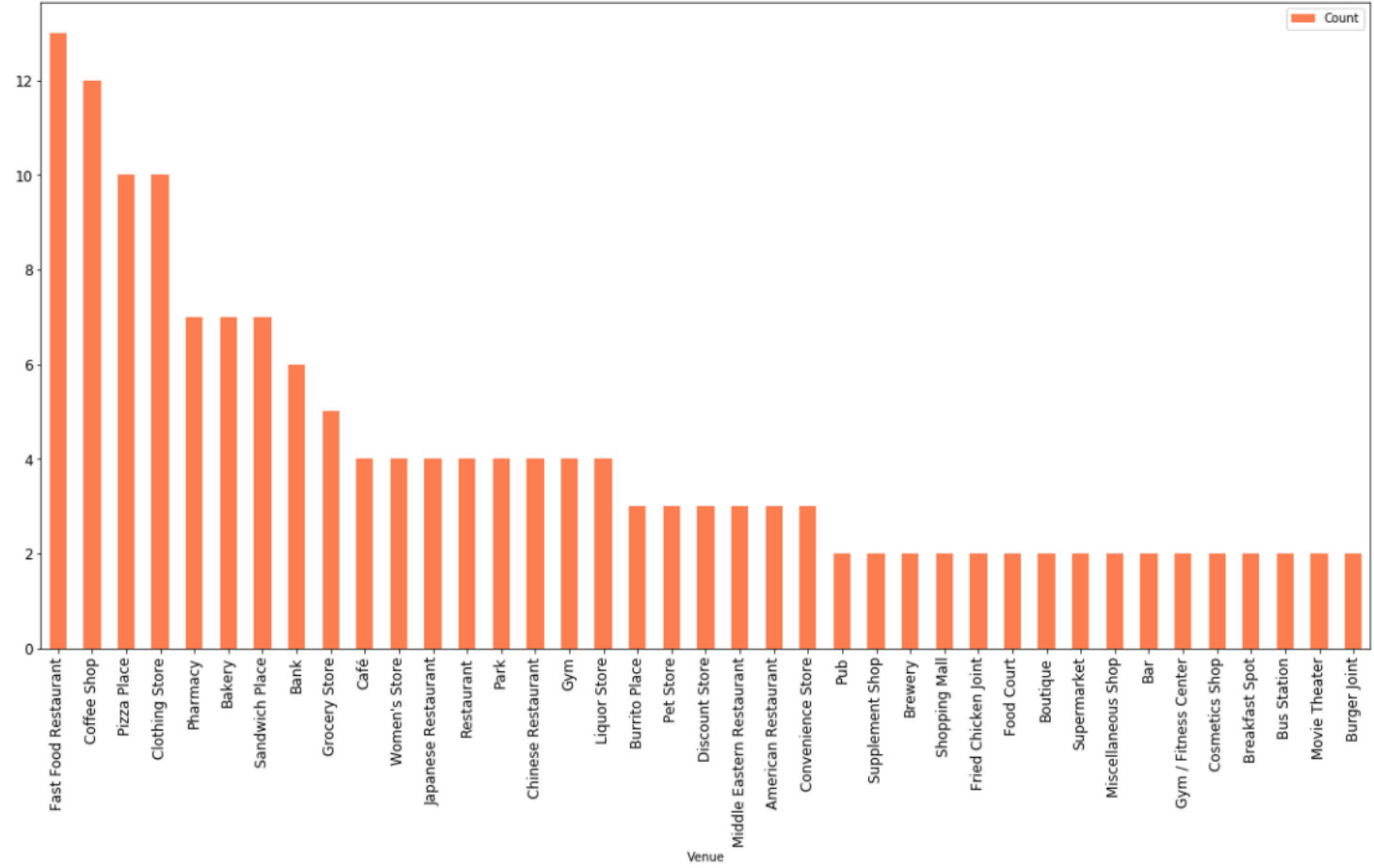
And the map view:
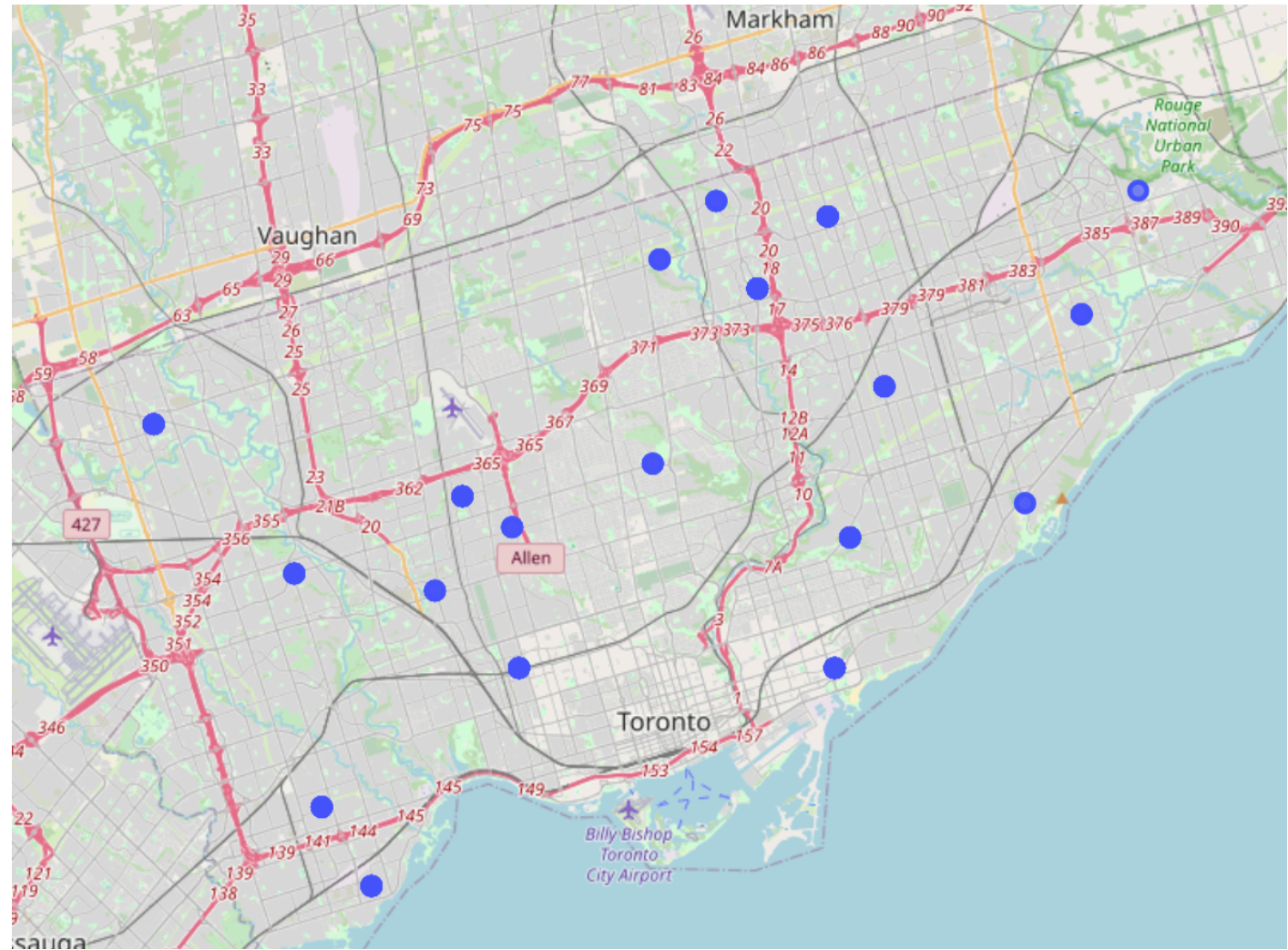
CONCLUSIONS:

There are 18 neighborhoods without yoga studios

Most of them located in calm residential areas or by nature resorts (parks or a sea shore)

Future analysis can estimate crime situation in each neighborhood