

BEST AREA TO OPEN A GYM IN TORONTO

IBM data science Capstone project

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OBJECTIVE

The main objective of this project is to find suitable location in Toronto, Canada to open a new gym

APPROACH

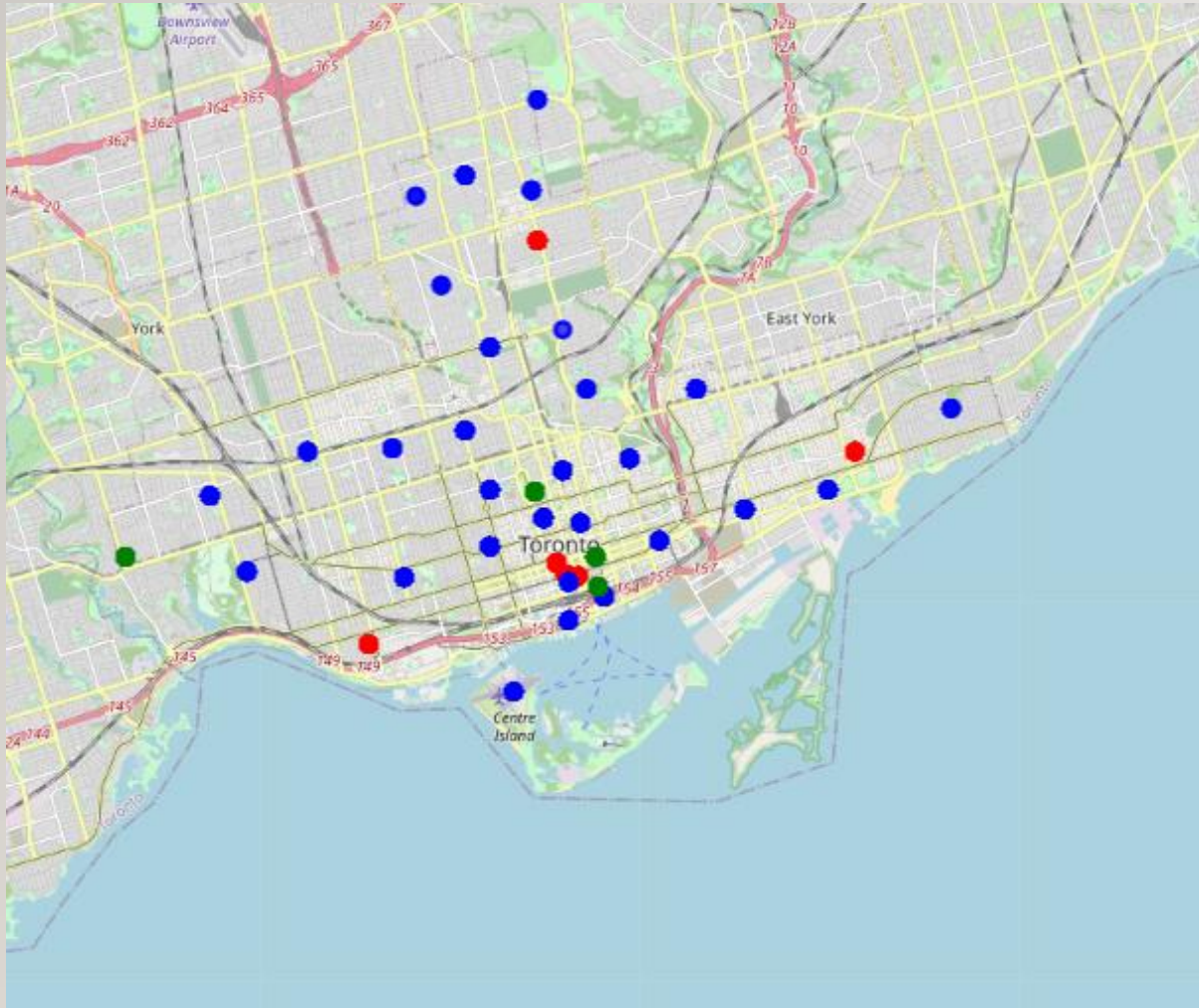
- Find the list of neighbourhoods by extracting data from the Wikipedia link:
https://en.wikipedia.org/wiki/List_of_postal_codes_of_Canada:_M
- Collection of coordinates from the CSV file provided by IBM and joining them with the Toronto neighbourhoods.
- Foursquare API was used to obtain top 100 venues within 500 metres radius.
- K- means clustering algorithm was used to cluster the data on neighbourhoods, venues.
- Recommendations based on the information obtained based on the gyms present in different clusters.

SOME OF THE VENUES IN TORONTO

```
toronto_venues = getNearbyVenues(names=df_toronto['Neighborhood'],  
                                latitudes=df_toronto['Latitude'],  
                                longitudes=df_toronto['Longitude'])
```

```
The Beaches  
The Danforth West, Riverdale  
India Bazaar, The Beaches West  
Studio District  
Lawrence Park  
Davisville North  
North Toronto West, Lawrence Park  
Davisville  
Moore Park, Summerhill East  
Summerhill West, Rathnelly, South Hill, Forest Hill SE, Deer Park  
Rosedale  
St. James Town, Cabbagetown  
Church and Wellesley  
Regent Park, Harbourfront  
Garden District, Ryerson  
St. James Town  
Berczy Park  
Central Bay Street  
Richmond, Adelaide, King  
Harbourfront East, Union Station, Toronto Islands  
Toronto Dominion Centre, Design Exchange  
Commerce Court, Victoria Hotel  
Roselawn  
Forest Hill North & West, Forest Hill Road Park  
The Annex, North Midtown, Yorkville  
University of Toronto, Harbord  
Kensington Market, Chinatown, Grange Park  
CN Tower, King and Spadina, Railway Lands, Harbourfront West, Bathurst Quay, South Niagara, Island airport  
Stn A PO Boxes  
First Canadian Place, Underground city  
Christie  
Dufferin, Dovercourt Village  
Little Portugal, Trinity  
Brockton, Parkdale Village, Exhibition Place  
High Park, The Junction South  
Parkdale, Roncesvalles  
Runnymede, Swansea  
Queen's Park, Ontario Provincial Government  
Business reply mail Processing Centre, South Central Letter Processing Plant Toronto
```



CLUSTERS

-
- The red coloured marker represents cluster 0
 - The blue coloured marker represents cluster 1
 - The green coloured marker represents cluster 2

CLUSTER 2

```
#Cluster 0  
to_merged.loc[(to_merged['Cluster Labels'] == 0) & (to_merged['Venue Category'] == 'Gym') ]
```

```
]:
```

	Neighborhood	Gym	Cluster Labels	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
7	Commerce Court, Victoria Hotel	0.040000	0	43.648198	-79.379817	Equinox Bay Street	43.648100	-79.379989	Gym
25	Richmond, Adelaide, King	0.040000	0	43.650571	-79.384568	GoodLife Fitness Toronto Bell Trinity Centre	43.653438	-79.382314	Gym
25	Richmond, Adelaide, King	0.040000	0	43.650571	-79.384568	Equinox Bay Street	43.648100	-79.379989	Gym
7	Commerce Court, Victoria Hotel	0.040000	0	43.648198	-79.379817	GoodLife Fitness Toronto Street Women's Only	43.650400	-79.378700	Gym
8	Davisville	0.060606	0	43.704324	-79.388790	Crossfit Metric	43.707480	-79.389857	Gym
8	Davisville	0.060606	0	43.704324	-79.388790	GoodLife Fitness Toronto Mount Pleasant and Da...	43.700802	-79.386417	Gym
7	Commerce Court, Victoria Hotel	0.040000	0	43.648198	-79.379817	GoodLife Fitness Toronto 137 Yonge Street	43.651242	-79.378068	Gym
7	Commerce Court, Victoria Hotel	0.040000	0	43.648198	-79.379817	Toronto Athletic Club	43.647360	-79.381177	Gym
1	Brockton, Parkdale Village, Exhibition Place	0.043478	0	43.636847	-79.428191	Reebok Crossfit Liberty Village	43.637038	-79.424802	Gym
16	India Bazaar, The Beaches West	0.052632	0	43.668999	-79.315572	System Fitness	43.667171	-79.312733	Gym
11	First Canadian Place, Underground city	0.040000	0	43.648429	-79.382280	GoodLife Fitness Toronto 137 Yonge Street	43.651242	-79.378068	Gym
11	First Canadian Place, Underground city	0.040000	0	43.648429	-79.382280	The Cambridge Club	43.651663	-79.383075	Gym
25	Richmond, Adelaide, King	0.040000	0	43.650571	-79.384568	Cardio-Go	43.647017	-79.388143	Gym
11	First Canadian Place, Underground city	0.040000	0	43.648429	-79.382280	Equinox Bay Street	43.648100	-79.379989	Gym
25	Richmond, Adelaide, King	0.040000	0	43.650571	-79.384568	Toronto Athletic Club	43.647360	-79.381177	Gym
11	First Canadian Place, Underground city	0.040000	0	43.648429	-79.382280	Toronto Athletic Club	43.647360	-79.381177	Gym

```
#Cluster 1
to_merged.loc[(to_merged['Cluster Labels'] == 1) & (to_merged['Venue Category'] == 'Gym') ]
```

1]:

	Neighborhood	Gym	Cluster Labels	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
37	Toronto Dominion Centre, Design Exchange	0.01	1	43.647177	-79.381576	Equinox Bay Street	43.648100	-79.379989	Gym
13	Garden District, Ryerson	0.01	1	43.657162	-79.378937	GoodLife Fitness Toronto Bell Trinity Centre	43.653436	-79.382314	Gym
14	Harbourfront East, Union Station, Toronto Islands	0.01	1	43.640816	-79.381752	GoodLife Fitness Toronto Union Station	43.644336	-79.383625	Gym

CLUSTER 1

CLUSTER 2

```
#Cluster 2
```

```
to_merged.loc[(to_merged['Cluster Labels'] ==2) & (to_merged['Venue Category'] == 'Gym') ]
```

2]:

	Neighborhood	Gym	Cluster Labels	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
23	Queen's Park, Ontario Provincial Government	0.028571	2	43.662301	-79.389494	Hart House Gym	43.664172	-79.394888	Gym
29	St. James Town	0.024096	2	43.651494	-79.375418	Wynn Fitness	43.648009	-79.373720	Gym
28	Runnymede, Swansea	0.027027	2	43.651571	-79.484450	Think Fitness	43.647966	-79.486462	Gym
29	St. James Town	0.024096	2	43.651494	-79.375418	GoodLife Fitness Toronto 137 Yonge Street	43.651242	-79.378068	Gym
31	Stn A PO Boxes	0.020408	2	43.646435	-79.374846	GoodLife Fitness Toronto Street Women's Only	43.650400	-79.376700	Gym
31	Stn A PO Boxes	0.020408	2	43.646435	-79.374846	Equinox Bay Street	43.648100	-79.379989	Gym

CONCLUSION

- Most of the gyms are in cluster 0, so any potential gym operator should not open their gym in cluster 0, as there will be high competition.
- Cluster 1 has three gyms, so there will be less competition. Hence, any potential gym operator would be well advised to open a gym here.
- Cluster 2 has six gyms, as such any potential gym operator may face low to medium level of competition.
- **Advice:** This project recommends that any potential gym operator should open their gym in cluster 1 as there is low competition, this will in turn result in high profitability, owing to the low competition.