The Bowling Alley for York Students, Toronto

I. Introduction / Business Problem:

The students of York University - Toronto, do not have a place nearby, where they can let their hair down during a very demanding semester. Nor do they have a food joint that is open beyond 10pm.

A recreational place like a Bowling alley that serves good, multi-cuisine food with a Karaoke Bar would be an ideal spot for the youngsters to gather and relax. This place would be of greater importance when winter starts. Students need not have to travel far - to have a few hours of relaxation.

Since there would always be a given number of student community in the campus, any person wishing to run this business would stand to see good profits and the students would also relish the place.

II. Approach & Data Usage:

Download and Explore Dataset

The following URL can be used to download the dataset that is available in Wikipedia. (https://en.wikipedia.org/wiki/List_of_postal_codes_of_Canada:_M) provides data about Toronto and its neighborhoods.

To explore the data, it is essential to transform the raw data into a Pandas dataframe. Geopy library can be used to get the latitude and longitude values of the neighborhoods considered for our project.

Follow the below steps to get Boroughs, Neighborhood and co-ordinates of York:

a) Scrape the Wikipedia page for getting the contents of Neighborhood table.
b) Map the values scraped from Wikipedia and load them under the respective columns.
c) Get the Latitude and Longitudes using the Geospatial data from below URL. (http://cocl.us/Geospatial_data)
d) Get the final dataframe that has Boroughs in York.

Index	PostalCode	Borough	Neighborhood	Latitude	Longitude
0	M3A	North York	Parkwoods	43.753259	-79.329656
1	M4A	North York	Victoria Village	43.725882	-79.315572
2	M6A	North York	Lawrence Manor, Lawrence Heights	43.718518	-79.464763
3	M3B	North York	Don Mills	43.745906	-79.352188

4	M4B	East York	Parkview Hill, Woodbine Gardens	43.706397	-79.309937
5	M6B	North York	Glencairn	43.709577	-79.445073
6	M3C	North York	Don Mills	43.725900	-79.340923
7	M4C	East York	Woodbine Heights	43.695344	-79.318389
8	M6C	York	Humewood-Cedarvale	43.693781	-79.428191
9	M6E	York	Caledonia-Fairbanks	43.689026	-79.453512
10	M4G	East York	Leaside	43.709060	-79.363452
11	M2H	North York	Hillcrest Village	43.803762	-79.363452
12	M3H	North York	Bathurst Manor, Wilson Heights, Downsview North	43.754328	-79.442259
13	M4H	East York	Thorncliffe Park	43.705369	-79.349372
14	M2J	North York	Fairview, Henry Farm, Oriole	43.778517	-79.346556
15	M3J	North York	Northwood Park, York University	43.767980	-79.487262
16	M4J	East York	East Toronto, Broadview North (Old East York)	43.685347	-79.338106
17	M2K	North York	Bayview Village	43.786947	-79.385975
18	M3K	North York	Downsview	43.737473	-79.464763
19	M2L	North York	York Mills, Silver Hills	43.757490	-79.374714
20	M3L	North York	Downsview	43.739015	-79.506944
21	M6L	North York	North Park, Maple Leaf Park, Upwood Park	43.713756	-79.490074
22	M9L	North York	Humber Summit	43.756303	-79.565963
23	M2M	North York	Willowdale, Newtonbrook	43.789053	-79.408493
24	M3M	North York	Downsview	43.728496	-79.495697
25	M5M	North York	Bedford Park, Lawrence Manor East	43.733283	-79.419750
26	M6M	York	Del Ray, Mount Dennis, Keelsdale and Silverthorn	43.691116	-79.476013
27	M9M	North York	Humberlea, Emery	43.724766	-79.532242
28	M2N	North York	Willowdale, Willowdale East	43.770120	-79.408493
29	M3N	North York	Downsview	43.761631	-79.520999
30	M6N	York	Runnymede, The Junction North	43.673185	-79.487262
31	M9N	York	Weston	43.706876	-79.518188
32	M2P	North York	York Mills West	43.752758	-79.400049
33	M2R	North York	Willowdale, Willowdale West	43.782736	-79.4422

III. Methodology:

Explore Neighborhoods in Toronto

Write code to explore the venues across the Neighborhoods to check if there are eateries and bowling alleys.

a) We are interested in Northwood Park, York University.
b) From the table above, choose the Latitude and Longitude of York University Neighborhood.
c) Map the values scraped from Wikipedia and load them under the respective columns.
d) Get Top venues that are in York University within a radius of 1500 meters.
e) Extract the categories of the Venue.

Index	name	categories	lat	lng
0	MUSE Massage Spa	Massage Studio	43.765686	-79.489318
1	Carribean Heat	Caribbean Restaurant	43.764155	-79.490227
2	Bamiyan Kabob	Middle Eastern Restaurant	43.773769	-79.492741
3	Nino D'Aversa	Pizza Place	43.759913	-79.488885
4	Elite Restaurant	Restaurant	43.767935	-79.475379
5	Tim Hortons	Coffee Shop	43.764289	-79.488790
6	Tim Hortons	Coffee Shop	43.768074	-79.472489
7	Walmart Supercentre	Furniture / Home Store	43.757860	-79.488981
8	Decorium	Furniture / Home Store	43.776867	-79.474017
9	Thai Express	Restaurant	43.773536	-79.501941
10	Dollarama	Discount Store	43.756249	-79.487950
11	Starbucks	Coffee Shop	43.766762	-79.475957
12	Aroma Espresso Bar	Coffee Shop	43.769918	-79.502217
13	Subway	Sandwich Place	43.767815	-79.469573
14	Oishi Sushi	Japanese Restaurant	43.763523	-79.490136
15	TD Canada Trust	Bank	43.762819	-79.490251
16	Tim Hortons	Coffee Shop	43.760737	-79.499224
17	Tim Hortons	Coffee Shop	43.774266	-79.493165
18	Tim Hortons	Coffee Shop	43.772286	-79.503403
19	Petro-Canada	Gas Station	43.760887	-79.499426

20	Tim Hortons (TEL Building)	Coffee Shop	43.773197	-79.501292
21	Petro-Canada	Gas Station	43.757344	-79.489424
22	Shoppers Drug Mart	Pharmacy	43.778061	-79.495432
23	Zteca	Mexican Restaurant	43.774164	-79.501898
24	Fox & Fiddle	Bar	43.763795	-79.488497
25	Tim Hortons	Coffee Shop	43.772052	-79.500094
26	Hero Certified Burgers	Burger Joint	43.774222	-79.501806
27	Pizza Pizza	Pizza Place	43.772555	-79.504646
28	McDonald's	Fast Food Restaurant	43.762413	-79.490243
29	Pizza Nova	Pizza Place	43.762762	-79.491208
30	Falafel Hut	Falafel Restaurant	43.774113	-79.501946
31	Domino's Pizza	Pizza Place	43.773446	-79.492938
32	La Prep	Café	43.774168	-79.501889
33	Sakura	Japanese Restaurant	43.774224	-79.501720
34	University City Mall	Shopping Mall	43.763555	-79.499085
35	Fountainhead Park	Park	43.762781	-79.499154
36	Noodles on Finch	Chinese Restaurant	43.767907	-79.471975
37	York Lanes	Shopping Mall	43.774050	-79.502123
38	Wendy's	Fast Food Restaurant	43.773910	-79.502963
39	Mandarin Buffet	Chinese Restaurant	43.767300	-79.469597
40	Cucinetta	Italian Restaurant	43.774207	-79.501543
41	Café Supreme	Café	43.774262	-79.502103
42	Mr. Greek Mediterranean Bar + Grill	Greek Restaurant	43.768594	-79.468986

Analyze each Neighborhood

Analyze each Neighborhood by grouping them into categories like "Restaurants", "Coffee Shops", "Parks", "Convenience Stores", etc.

This helps us to narrow down a location or a Neighborhood that can be recommended for a possible entrepreneur willing to open a new business.

Upon analyzing the neighborhoods, we can see the Top 10 most common venue.

Given below is a sample of first 5 neighborhoods.

	Neighborhood	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue	9th Most Common Venue	10th Most Common Venue
0	Bathurst Manor, Wilson Heights, Downsview North	Coffee Shop	Bank	Ice Cream Shop	Middle Eastern Restaurant	Mobile Phone Shop	Fried Chicken Joint	Pharmacy	Pizza Place	Deli / Bodega	Bridal Shop
1	Bayview Village	Japanese Restaurant	Chinese Restaurant	Café	Bank	Electronics Store	Convenience Store	Cosmetics Shop	Curling Ice	Deli / Bodega	Department Store
2	Bedford Park, Lawrence Manor East	Italian Restaurant	Restaurant	Sandwich Place	Coffee Shop	Greek Restaurant	Hobby Shop	Café	Liquor Store	Butcher	Pharmacy
3	Caledonia-Fairbanks	Park	Bakery	Women's Store	Gas Station	Distribution Center	Comfort Food Restaurant	Construction & Landscaping	Convenience Store	Cosmetics Shop	Curling Ice
4	Del Ray, Mount Dennis, Keelsdale and Silverthorn	Convenience Store	Bar	Sandwich Place	Discount Store	Yoga Studio	Dog Run	Comfort Food Restaurant	Construction & Landscaping	Cosmetics Shop	Curling Ice

Cluster Neighborhoods

Run k-means to cluster the neighborhoods into 5 clusters. Use a Folium map to visualize the resulting clusters.

Below is a sample of how Cluster 1.0 looks like, along with the Most common venues in that Neighborhood.

	index	PostalCode	Borough	Neighborhood	Latitude	Longitude	Cluster Labels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue	9th Most Com V
0	0	M3A	North York	Parkwoods	43.753259	-79.329656	1.0	Park	Construction & Landscaping	Food & Drink Shop	Yoga Studio	Distribution Center	Comfort Food Restaurant	Convenience Store	Cosmetics Shop	Curlii
1	1	M4A	North York	Victoria Village	43.725882	-79.315572	1.0	Coffee Shop	Pizza Place	Portuguese Restaurant	Hockey Arena	Intersection	Discount Store	Comfort Food Restaurant	Construction & Landscaping	Conver
2	3	M6A	North York	Lawrence Manor, Lawrence Heights	43.718518	-79.464763	1.0	Clothing Store	Accessories Store	Furniture / Home Store	Athletics & Sports	Miscellaneous Shop	Boutique	Event Space	Coffee Shop	Arts &
3	7	M3B	North York	Don Mills	43.745906	-79.352188	1.0	Japanese Restaurant	Coffee Shop	Restaurant	Asian Restaurant	Gym	Beer Store	Café	Italian Restaurant	San
4	8	M4B	East York	Parkview Hill, Woodbine Gardens	43.706397	-79.309937	1.0	Pizza Place	Pet Store	Athletics & Sports	Gastropub	Pharmacy	Fast Food Restaurant	Bank	Intersection	F C
5	10	M6B	North York	Glencairn	43.709577	-79.445073	1.0	Italian Restaurant	Pub	Asian Restaurant	Japanese Restaurant	Bakery	Distribution Center	Discount Store	Diner	Din Resta
6	13	M3C	North York	Don Mills	43.725900	-79.340923	1.0	Japanese Restaurant	Coffee Shop	Restaurant	Asian Restaurant	Gym	Beer Store	Café	Italian Restaurant	San
7	14	M4C	East York	Woodbine Heights	43.695344	-79.318389	1.0	Pharmacy	Athletics & Sports	Park	Beer Store	Curling Ice	Skating Rink	Cosmetics Shop	Convenience Store	Cons Lands

Examine Clusters

Examine each of the above 5 clusters. See if there are multiple locations available for recommendation to solve our problem identified earlier (which is to find a location to start a new business of Bowling alley that can also double up as an eatery & music place)

Cluster 1:

	PostalCode	Longitude	Cluster Labels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue	9th Most Common Venue	10th Most Common Venue
19	M2L	-79.374714	0.0	Cafeteria	Yoga Studio	Clothing Store	Comfort Food Restaurant	Construction & Landscaping	Convenience Store	Cosmetics Shop	Curling Ice	Deli / Bodega	Department Store

Cluster 2:

	PostalCode	Longitude	Cluster Labels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue	9th Most Common Venue	10th Most Common Venue
0	M3A	-79.329656	1.0	Park	Construction & Landscaping	Food & Drink Shop	Yoga Studio	Distribution Center	Comfort Food Restaurant	Convenience Store	Cosmetics Shop	Curling Ice	Deli / Bodega
1	M4A	-79.315572	1.0	Coffee Shop	Pizza Place	Portuguese Restaurant	Hockey Arena	Intersection	Discount Store	Comfort Food Restaurant	Construction & Landscaping	Convenience Store	Cosmetics Shop
2	M6A	-79.464763	1.0	Clothing Store	Accessories Store	Furniture / Home Store	Athletics & Sports	Miscellaneous Shop	Boutique	Event Space	Coffee Shop	Arts & Crafts Store	Women's Store
3	M3B	-79.352188	1.0	Japanese Restaurant	Coffee Shop	Restaurant	Asian Restaurant	Gym	Beer Store	Café	Italian Restaurant	Sandwich Place	Dim Sum Restaurant
4	M4B	-79.309937	1.0	Pizza Place	Pet Store	Athletics & Sports	Gastropub	Pharmacy	Fast Food Restaurant	Bank	Intersection	Gym / Fitness Center	Food Court
5	M6B	-79.445073	1.0	Italian Restaurant	Pub	Asian Restaurant	Japanese Restaurant	Bakery	Distribution Center	Discount Store	Diner	Dim Sum Restaurant	Dessert Shop
6	M3C	-79.340923	1.0	Japanese Restaurant	Coffee Shop	Restaurant	Asian Restaurant	Gym	Beer Store	Café	Italian Restaurant	Sandwich Place	Dim Sum Restaurant
7	M4C	-79.318389	1.0	Pharmacy	Athletics & Sports	Park	Beer Store	Curling Ice	Skating Rink	Cosmetics Shop	Convenience Store	Construction & Landscaping	Distribution Center
8	M6C	-79.428191	1.0	Hockey Arena	Playground	Trail	Field	Deli / Bodega	Diner	Dim Sum Restaurant	Dessert Shop	Department Store	Yoga Studio

Cluster 3:

	PostalCode	Longitude	Cluster Labels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue	9th Most Common Venue	10th Most Common Venue
9	M6E	-79.453512	2.0	Park	Bakery	Women's Store	Gas Station	Distribution Center	Comfort Food Restaurant	Construction & Landscaping	Convenience Store	Cosmetics Shop	Curling Ice
16	M4J	-79.338106	2.0	Park	Convenience Store	Yoga Studio	Golf Course	Comfort Food Restaurant	Construction & Landscaping	Cosmetics Shop	Curling Ice	Deli / Bodega	Department Store
31	M9N	-79.518188	2.0	Park	Yoga Studio	Golf Course	Comfort Food Restaurant	Construction & Landscaping	Convenience Store	Cosmetics Shop	Curling Ice	Deli / Bodega	Department Store
32	M2P	-79.400049	2.0	Park	Convenience Store	Yoga Studio	Golf Course	Comfort Food Restaurant	Construction & Landscaping	Cosmetics Shop	Curling Ice	Deli / Bodega	Department Store

Cluster 4:

	PostalCode	Longitude	Cluster Labels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue	9th Most Common Venue	10th Most Common Venue
27	M9M	-79.532242	3.0	Baseball Field	Yoga Studio	Dog Run	Comfort Food Restaurant	Construction & Landscaping	Convenience Store	Cosmetics Shop	Curling Ice	Deli / Bodega	Department Store

Cluster 5:

	PostalCode	Longitude	Cluster Labels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue	9th Most Common Venue	10th Most Common Venue
22	M9L	-79.565963	4.0	Pizza Place	Furniture / Home Store	Distribution Center	Coffee Shop	Comfort Food Restaurant	Construction & Landscaping	Convenience Store	Cosmetics Shop	Curling Ice	Deli / Bodega

IV. Results:

Upon going through the various clusters and examining the most common top venues among the neighborhoods, we can see that

- A Bowling alley is absent around 1500m radius of the York University campus.
- Neither do we have a Karaoke bar in the same radius.

V. Observations and Recommendations:

Observation 1:

It can be clearly seen that there are various Coffee Shops like Tim Hortons, Starbucks, Aroma Espresso Bar within the University campus.

Observation 2:

There are Pizza places like Pizza Pizza, Pizza Nova, Domino's Pizza nearby. But, none of them are open beyond 10 pm.

Observation 3:

The top-most frequented places in our study area are

i) Cafeteria &
ii) Baseball Field

The above 2 venues are followed by frequent visitors to

i) Pizza Place
ii) Convenience Store
iii) Home Store
iv) Park
v) Bank
vi) Bakery
vii) Grocery Store

Recommendations

The recommendation is to pick any of the neighborhood from the top 5 clusters to establish a Bowling alley along with Karaoke bar serving multi-cuisine food.

My top 2 recommendations are

1) Humberlea, Emery
   a. It is closer to Expressway 401 and well connected with activities all around.
   b. Safer place as there are other establishments
2) Weston
   a. It is closer to Expressway 407 and well connected with activities all around.
   b. Safer place as there are other establishments

VI. Conclusion:

The conclusion of this Capstone project is that - York University, Toronto is a school that attracts students & faculties from multiple countries.

The campus and the surroundings are adequately equipped with all the necessary amenities.

But when it comes to having a place where the youngsters would like to meet and have some fun playing bowling or listening to some good music is blaringly missing.

Most of the eateries close down by 10 pm, which is pretty early for the students who are awake into the wee hours to catch up with their studies.

When winter strikes (which can be pretty harsh in this region), it restricts the movement of the students and thus denying them an opportunity to recharge their batteries.

A Bowling Alley that serves multi-cuisine food along with a Karaoke Bar is a great Business opportunity for Entrepreneurs and a welcome outlet for the residents of the York University.

** Thank You **