

# **Finding the best location for taco restaurants in Toronto**

Applied Data Science Capstone - Final Presentation

# Introduction

In this project we will try to find an optimal location for a restaurant. Specifically, this report will be targeted to stakeholders interested in opening an taco restaurant in Toronto.

We will use our data science powers to generate a few most promising neighborhoods based on this criteria. Advantages of each area will then be clearly expressed so that best possible final location can be chosen by stakeholders.

# Predicting the best location is important

- For an entrepreneur looking to open up a new taco restaurant, it is important for them to determine where the best location would be in order to:
  - Avoid the risk of losing too many potential customers to an already established competitor
  - Avoid the risk of not having enough potential customers in the area to begin with
- The same methods could also be used for entrepreneurs looking to open up a business of any variety, by making just a few necessary tweaks to fit the category.

# Data

The factors that would determine where an ideal place to open up a taco restaurant in Toronto would be:

Postal code data will be sourced from the following Wikipedia page:

[https://en.wikipedia.org/wiki/List\\_of\\_postal\\_codes\\_of\\_Canada:\\_M](https://en.wikipedia.org/wiki/List_of_postal_codes_of_Canada:_M)

- Geographical coordinates will be sourced from the following .csv link:

[http://cocl.us/Geospatial\\_data](http://cocl.us/Geospatial_data)

- taco restaurant ,office and school building data will be sourced from Foursquare API

# Postal Code Data and Geographical Coordinates

Postal code data was taken from the Wikipedia

Geographical coordinates were taken from the .csv file

The data was cleaned, and a simple map showing each location was created

# Getting Datas ( Coordinates of Locations, Count of Taco Restaurants, Office and School Buildings per location)

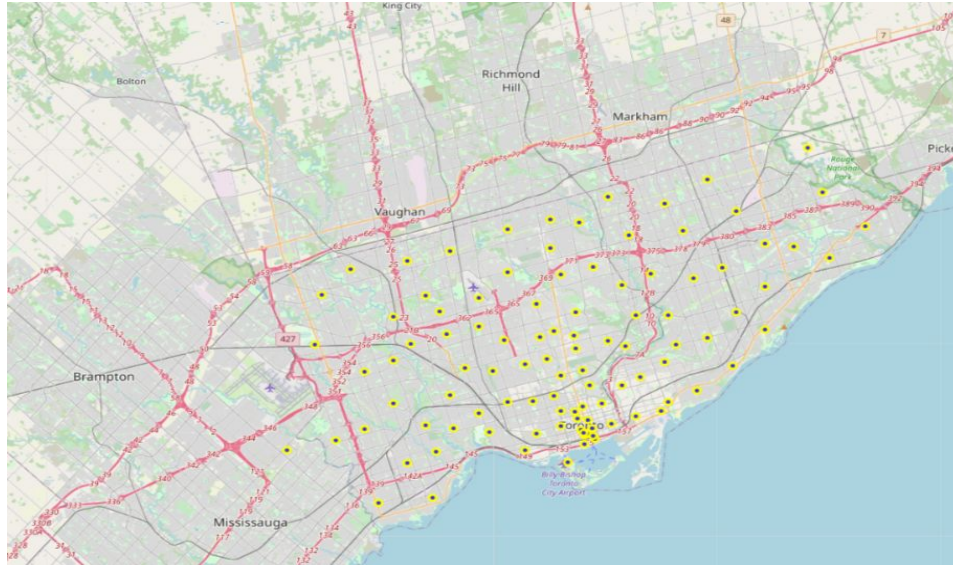
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Taco restaurant ,office and school building data will be sourced from Foursquare API

# Postal Code Data and Geographical Coordinates

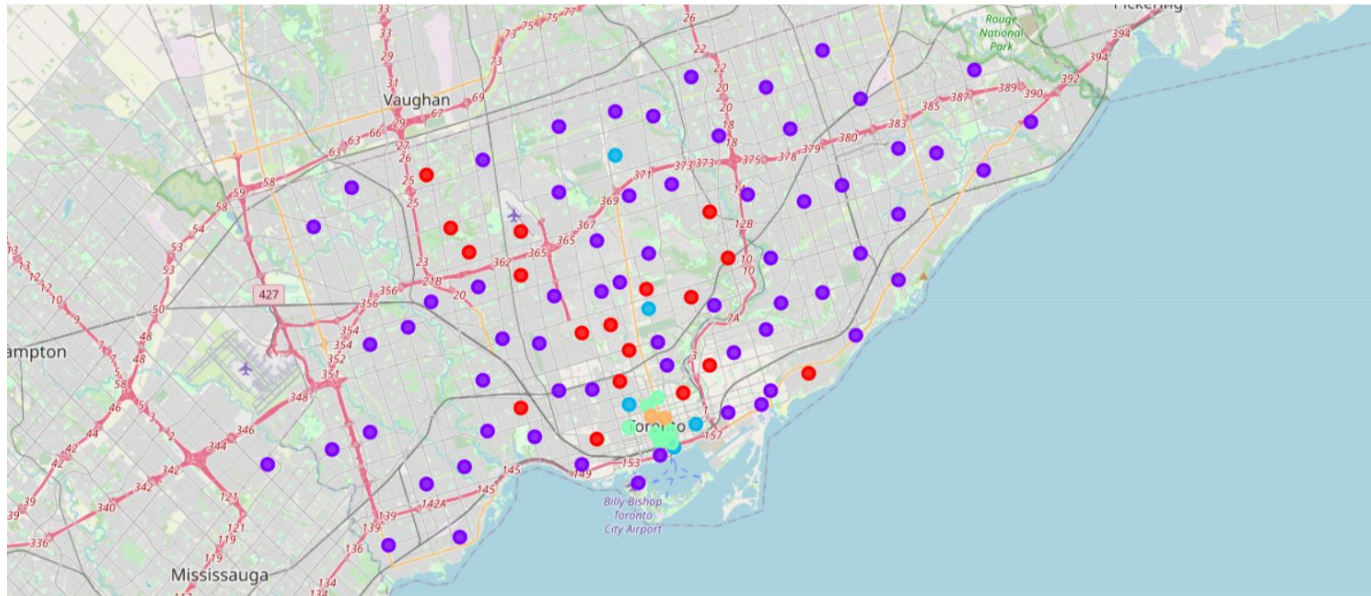


## Count of Taco Restaurants, Office and School Buildings per location

	Restaurant Count	Office Count	School Count	Population	success rate	Neighbourhood	Postal Code	Borough	Latitude	Longitude
0	0.0	23.0	13.0	283.0	283.0	University of Toronto, Harbord	M5S	Downtown Toronto	43.662696	-79.400049
1	0.0	10.0	12.0	250.0	250.0	Regent Park, Harbourfront	M5A	Downtown Toronto	43.654260	-79.360636
2	0.0	13.0	10.0	213.0	213.0	Willowdale, Willowdale East	M2N	North York	43.770120	-79.408493
3	0.0	15.0	9.0	195.0	195.0	Davisville	M4S	Central Toronto	43.704324	-79.388790
4	0.0	50.0	7.0	190.0	190.0	Berczy Park	M5E	Downtown Toronto	43.644771	-79.373306
...	...	...	...	...	...	...	...	...	...	...
93	0.0	1.0	0.0	1.0	1.0	Dorset Park, Wexford Heights, Scarborough Town...	M1P	Scarborough	43.757410	-79.273304
94	0.0	1.0	0.0	1.0	1.0	Business reply mail Processing Centre, South C...	M7Y	East Toronto	43.662744	-79.321558
95	0.0	1.0	0.0	1.0	1.0	Glencairn	M6B	North York	43.709577	-79.445073
96	0.0	1.0	0.0	1.0	1.0	Rouge Hill, Port Union, Highland Creek	M1C	Scarborough	43.784535	-79.160497
97	0.0	1.0	0.0	1.0	1.0	Wexford, Maryvale	M1R	Scarborough	43.750072	-79.295849



# K-Means Clustering with The Data



# The 1'st Cluster

Cluster Labels	Restaurant Count	Office Count	School Count	Population	success rate	Neighbourhood	Postal Code	Borough	Latitude	Longitude	
5	0	0.0	5.0	8.0	165.0	165.0	Little Portugal, Trinity	M6J	West Toronto	43.647927	-79.419750
6	0	0.0	13.0	7.0	153.0	153.0	Don Mills	M3B	North York	43.745906	-79.352188
7	0	0.0	13.0	7.0	153.0	153.0	Don Mills	M3C	North York	43.725900	-79.340923
8	0	0.0	8.0	7.0	148.0	148.0	The Danforth West, Riverdale	M4K	East Toronto	43.679557	-79.352188
9	0	0.0	3.0	7.0	143.0	143.0	The Annex, North Midtown, Yorkville	M5R	Central Toronto	43.672710	-79.405678
10	0	0.0	1.0	7.0	141.0	141.0	The Beaches	M4E	East Toronto	43.676357	-79.293031
11	0	0.0	0.0	7.0	140.0	140.0	Downsview	M3K	North York	43.737473	-79.464763
12	0	0.0	0.0	7.0	140.0	140.0	Downsview	M3L	North York	43.739015	-79.506944
13	0	0.0	0.0	7.0	140.0	140.0	Downsview	M3M	North York	43.728496	-79.495697
14	0	0.0	0.0	7.0	140.0	140.0	Downsview	M3N	North York	43.761631	-79.520999
15	0	0.0	9.0	6.0	129.0	129.0	St. James Town, Cabbagetown	M4X	Downtown Toronto	43.667967	-79.367675
17	0	0.0	5.0	6.0	125.0	125.0	Leaside	M4G	East York	43.709060	-79.363452
21	0	0.0	13.0	5.0	113.0	113.0	Davisville North	M4P	Central Toronto	43.712751	-79.390197
22	0	0.0	3.0	5.0	103.0	103.0	High Park, The Junction South	M6P	West Toronto	43.661608	-79.464763
24	0	0.0	1.0	5.0	101.0	101.0	Humewood-Cedarvale	M6C	York	43.693781	-79.428191
25	0	0.0	13.0	4.0	93.0	93.0	Summerhill West, Rathnelly, South Hill, Forest...	M4V	Central Toronto	43.686412	-79.400049
26	0	0.0	5.0	4.0	85.0	85.0	Forest Hill North & West, Forest Hill Road Park	M5P	Central Toronto	43.696948	-79.411307
27	0	0.0	5.0	4.0	85.0	85.0	Lawrence Manor, Lawrence Heights	M6A	North York	43.718518	-79.464763

## The 2'th Cluster

Cluster Labels	Restaurant Count	Office Count	School Count	Population	success rate	Neighbourhood	Postal Code	Borough	Latitude	Longitude	
29	1	0.0	0.0	4.0	80.0	80.0	Lawrence Park	M4N	Central Toronto	43.728020	-79.388790
30	1	0.0	0.0	4.0	80.0	80.0	York Mills, Silver Hills	M2L	North York	43.757490	-79.374714
31	1	0.0	11.0	3.0	71.0	71.0	Brockton, Parkdale Village, Exhibition Place	M6K	West Toronto	43.636847	-79.428191
32	1	0.0	5.0	3.0	65.0	65.0	Christie	M6G	Downtown Toronto	43.669542	-79.422564
33	1	0.0	4.0	3.0	64.0	64.0	Runnymede, Swansea	M6S	West Toronto	43.651571	-79.484450
...	...	...	...	...	...	...	...	...	...	...	...
93	1	0.0	1.0	0.0	1.0	1.0	Dorset Park, Wexford Heights, Scarborough Town...	M1P	Scarborough	43.757410	-79.273304
94	1	0.0	1.0	0.0	1.0	1.0	Business reply mail Processing Centre, South C...	M7Y	East Toronto	43.662744	-79.321558
95	1	0.0	1.0	0.0	1.0	1.0	Glencairn	M6B	North York	43.709577	-79.445073
96	1	0.0	1.0	0.0	1.0	1.0	Rouge Hill, Port Union, Highland Creek	M1C	Scarborough	43.784535	-79.160497
97	1	0.0	1.0	0.0	1.0	1.0	Wexford, Maryvale	M1R	Scarborough	43.750072	-79.295849

64 rows × 11 columns

## The 3'th Cluster

Cluster Labels	Restaurant Count	Office Count	School Count	Population	success rate	Neighbourhood	Postal Code	Borough	Latitude	Longitude	
0	2	0.0	23.0	13.0	283.0	283.0	University of Toronto, Harbord	M5S	Downtown Toronto	43.662696	-79.400049
1	2	0.0	10.0	12.0	250.0	250.0	Regent Park, Harbourfront	M5A	Downtown Toronto	43.654260	-79.360636
2	2	0.0	13.0	10.0	213.0	213.0	Willowdale, Willowdale East	M2N	North York	43.770120	-79.408493
3	2	0.0	15.0	9.0	195.0	195.0	Davisville	M4S	Central Toronto	43.704324	-79.388790
4	2	0.0	50.0	7.0	190.0	190.0	Berczy Park	M5E	Downtown Toronto	43.644771	-79.373306

## The 4'th Cluster

Cluster Labels	Restaurant Count	Office Count	School Count	Population	success rate	Neighbourhood	Postal Code	Borough	Latitude	Longitude	
16	3	1.0	50.0	10.0	250.0	125.000000	Stn A PO Boxes	M5W	Downtown Toronto	43.646435	-79.374846
19	3	1.0	50.0	9.0	230.0	115.000000	Toronto Dominion Centre, Design Exchange	M5K	Downtown Toronto	43.647177	-79.381576
20	3	1.0	28.0	10.0	228.0	114.000000	Queen's Park, Ontario Provincial Government	M7A	Downtown Toronto	43.662301	-79.389494
28	3	3.0	50.0	14.0	330.0	82.500000	St. James Town	M5C	Downtown Toronto	43.651494	-79.375418
36	3	3.0	47.0	10.0	247.0	61.750000	Church and Wellesley	M4Y	Downtown Toronto	43.665860	-79.383160
42	3	3.0	50.0	9.0	230.0	57.500000	Commerce Court, Victoria Hotel	M5L	Downtown Toronto	43.648198	-79.379817
43	3	3.0	50.0	9.0	230.0	57.500000	First Canadian Place, Underground city	M5X	Downtown Toronto	43.648429	-79.382280
44	3	4.0	50.0	11.0	270.0	54.000000	Richmond, Adelaide, King	M5H	Downtown Toronto	43.650571	-79.384568
68	3	5.0	21.0	10.0	221.0	36.833333	Kensington Market, Chinatown, Grange Park	M5T	Downtown Toronto	43.653206	-79.400049

## The 5'th Cluster

Cluster Labels	Restaurant Count	Office Count	School Count	Population	success rate	Neighbourhood	Postal Code	Borough	Latitude	Longitude	
18	4	4.0	50.0	27.0	590.0	118.0	Garden District, Ryerson	M5B	Downtown Toronto	43.657162	-79.378937
23	4	4.0	50.0	23.0	510.0	102.0	Central Bay Street	M5G	Downtown Toronto	43.657952	-79.387383

# Discussion

Overall, the data makes it clear that the locations in cluster 4 are the most in need of a new taco restaurant, as the ratio of taco restaurants to office buildings is by far the lowest.

This means that if an entrepreneur were to open up a new taco restaurant in any of the areas grouped into cluster 4, they would be much more likely to have a higher number of customers than if the same restaurants had opened up in clusters 1, 2, 3, or 5.

# Conclusion

This project analyzed data from the Toronto area to determine where the best place for an entrepreneur to open up a taco restaurant would be by using K-means clustering, it was possible to determine the best locations for a new taco restaurant, based on the fact that it contained the lowest ratio of taco restaurants to office buildings. Therefore, an entrepreneur opening up a new taco restaurant in any of the locations grouped into this cluster would be likely to have a much higher number of potential customers.