

Data Science Capstone ~ IBM Data Science Professional Certificate on Coursera

By Johnpaul Ogbatue

Where to Setup an Art Gallery and in what area in Toronto?

Introduction

For the Applied Data Science Capstone Project, using real datasets described in my Data section, the problem I aim to solve is to analyze and advise my client (investor) coming to Toronto where to set up an Art Gallery and find the best place suitable knowing fully well that 90% of the visitors / tourist coming to Canada must visit Toronto. It is a known fact that Toronto Art generates a lot of revenue and our main target audience are tourists.

All the steps in this Data science project will be described step by step. I have started with defining a business case. Other steps such as data preparation (collecting, cleansing, etc.), analyzing and final outputs will be included in the final report.

These outputs and conclusions can be used by my client to make a decision.

.

Data section

I will use the Foursquare API to collect data about locations of Art Gallery locations in Toronto. See Data Sources below:

Data Sources

- https://en.wikipedia.org/wiki/List_of_postal_codes_of_Canada:_M - data sources for Toronto neighbourhoods and postal codes, which allows to make an interactive map used further in the project
- https://cocl.us/Geospatial_data - csv file provided by Coursera in order to get geolocation coordinates
- <https://developer.foursquare.com/docs> - source for various locations in Toronto and recommendations

Methodology

My optimum purpose here is to identify the most commonly visited Art Gallery and entertainment studios within the city of Toronto. I used the Four Square API through the venues channel based on the postal codes within the Toronto axis. I used the search query to get the venues in the city of Toronto alongside the categoryID, setting it to show Art and Entertainment only.

Next, I noticed some duplicates in the postal codes which needed to be removed based on the categories. Secondly, get the category type from the categories column. Thirdly, generalize the postal code for each venue using the postal code. Performed the One-Hot Encoding with respect to categories, then I identified the top three (3) most common venues.

I used K-Means to cluster the Art and Entertainment venues by their postal codes segmenting it into 5 clusters. Then using Folium Map to visualize it.

Results

From the visualization below, I can see that the most commonly visited Art Gallery using the Foursquare API are located around the **West Toronto** axis which are purple in color and fall under the first cluster which are scattered not too far off from the waterfront area. See Screenshot Fig A and Fig B for more details.

Fig A:

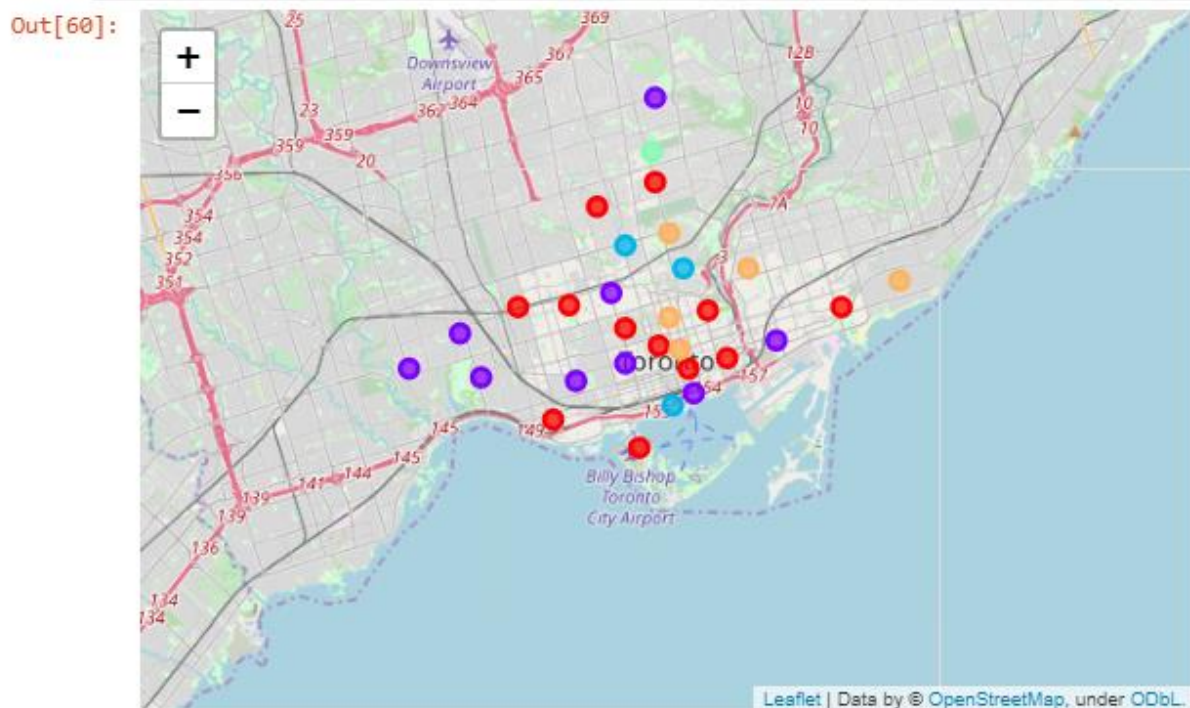


Fig B:

Cluster Labels	postalCode	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	Borough	Neighborhood	Latitude	Longitude
14	0	M5C	Salon / Barbershop	Tour Provider	Office	Downtown Toronto	St. James Town	43.651494 -79.375418
2	0	M4L	Zoo Exhibit	Dance Studio	Art Gallery	East Toronto	India Bazaar , The Beaches West	43.668999 -79.315572
26	0	M6K	Theme Park	Indie Movie Theater	Movie Theater	West Toronto	Brockton , Parkdale Village , Exhibition Place	43.636847 -79.428191
24	0	M6H	Beer Bar	Music Venue	Art Gallery	West Toronto	Dufferin , Dovercourt Village	43.669005 -79.442259
6	0	M4S	Movie Theater	Music Venue	Theater	Central Toronto	Davisville	43.704324 -79.368790
23	0	M6G	Art Gallery	Indie Movie Theater	Bar	Downtown Toronto	Christie	43.669542 -79.422564
22	0	M5V	Public Art	History Museum	Historic Site	Downtown Toronto	CN Tower , King and Spadina , Railway Lands , ...	43.628947 -79.394420
10	0	M4X	Theater	Zoo Exhibit	Concert Hall	Downtown Toronto	St. James Town , Cabbagetown	43.667967 -79.367675
20	0	M5S	Concert Hall	History Museum	Office	Downtown Toronto	University of Toronto , Harbord	43.662696 -79.400049
12	0	M5A	Museum	Recording Studio	Art Gallery	Downtown Toronto	Regent Park , Harbourfront	43.654260 -79.360636
18	0	M5P	Amphitheater	Movie Theater	Jazz Club	Central Toronto	Forest Hill North & West	43.696948 -79.411307
16	0	M5G	Art Museum	Performing Arts Venue	Zoo Exhibit	Downtown Toronto	Central Bay Street	43.657952 -79.387383
27	1	M6P	Art Gallery	Dance Studio	Zoo Exhibit	West Toronto	High Park , The Junction South	43.661608 -79.464763
25	1	M6J	Art Gallery	Arcade	Music Venue	West Toronto	Little Portugal , Trinity	43.647927 -79.419750
21	1	M5T	Art Gallery	University	Theater	Downtown Toronto	Kensington Market , Chinatown , Grange Park	43.653206 -79.400049
19	1	M5R	Art Gallery	History Museum	Performing Arts Venue	Central Toronto	The Annex , North Midtown , Yorkville	43.672710 -79.405678
29	1	M6S	Art Gallery	Dance Studio	Music Venue	West Toronto	Runnymede , Swansea	43.651571 -79.484450
28	1	M6R	Art Gallery	Zoo	Art Museum	West Toronto	Parkdale , Roncesvalles	43.648960 -79.456325
4	1	M4N	Art Gallery	Zoo Exhibit	Dance Studio	Central Toronto	Lawrence Park	43.728020 -79.388790
3	1	M4M	Art Gallery	Arcade	Tour Provider	East Toronto	Studio District	43.659526 -79.340923
15	1	M5E	Jazz Club	Art Gallery	Zoo Exhibit	Downtown Toronto	Berczy Park	43.644771 -79.373306
17	2	M5J	Arcade	Dance Studio	Music Venue	Downtown Toronto	Harbourfront East , Union Station , Toronto Is...	43.640816 -79.381752
9	2	M4W	Music Venue	Zoo Exhibit	Dance Studio	Downtown Toronto	Rosedale	43.679563 -79.377529
8	2	M4V	Arcade	Zoo Exhibit	Dance Studio	Central Toronto	Summerhill West , Rathnelly , South Hill , For...	43.686412 -79.400049
5	3	M4P	Event Space	Zoo Exhibit	Movie Theater	Central Toronto	Davisville North	43.712751 -79.390197
13	4	M5B	Dance Studio	General Entertainment	Public Art	Downtown Toronto	Garden District, Ryerson	43.657162 -79.378937
11	4	M4Y	General Entertainment	Dance Studio	Zoo Exhibit	Downtown Toronto	Church and Wellesley	43.665860 -79.383160
7	4	M4T	General Entertainment	Art Gallery	Zoo Exhibit	Central Toronto	Moore Park , Summerhill East	43.689574 -79.383160

Limitations: Limited data is an issue. Only 144 rows of data were obtained from 30 postal codes, which averages just 5.0 data points per postal codes

Conclusion:

There is no reason to doubt that **West Toronto** is the best place to setup an Art Gallery in Toronto. Metrics has shown that it is the most common venue in Toronto. Revenue generation will increase since it has been identified to be an attractive hub where visitors and tourists come to patronize Art related events.