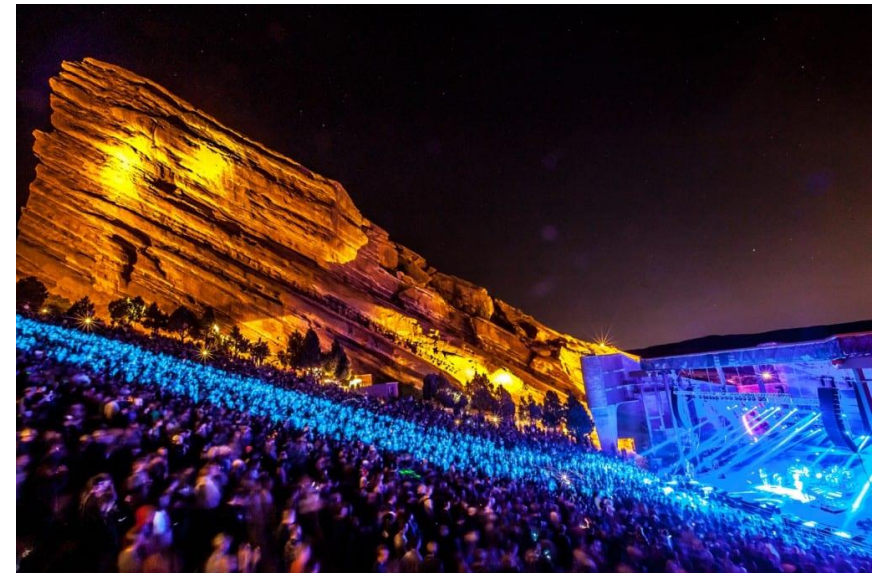


**Capstone Project - The Battle of the Neighborhoods,  
Building Live Music Venues in Toronto**

**Chi-Ta Yang**

# Introduction: Business Problem

- Music has played a substantial role in human's life. It is tightly connected to the course of human history. From the creative music blog, it is stated that music makes us creative, makes us express our emotion, and makes learning more pleasant.
- As the most populous city in Canada and the fourth most populous city in North America, the establishment of more live music venues can further decorate and upgrade the historical and diverse city of Toronto. This can provide valuable information to the Toronto officials and investors.
- To achieve the goal, we use data science techniques to suggest the potential borough and the type of live music venues to build in Toronto. The questions below will be answered through data science techniques:
  1. What are the kinds of venues surrounding the best live music venues?
  2. What are area in Toronto should the live music venues be invested upon?



# Data Source

1. The Best Live Music Avenues are needed for analysis. This piece of information are obtained from the ROLLING STONE magazine and musicgateway website. The latitudes and longitudes for each best live music venue can be obtained from latitude website.

- ROLLING STONE:10 Best Live Music Venues in America

- <https://www.rollingstone.com/music/music-lists/10-best-live-music-venues-in-america-767070/ottobar-baltimore-767244/>

- musicgateway: The 10 Best Live Music Venues In The US – NYC To San Francisco & More

- <https://www.musicgateway.com/blog/how-to/best-live-music-venues-in-the-us>

- latitude

- <https://latitude.to/articles-by-country/us/united-states/>

2. The borough information of Toronto is scrape off the following Wikipedia page using BeautifulSoup, and the corresponding Coordinate data is obtained link listed below.

- borough information

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

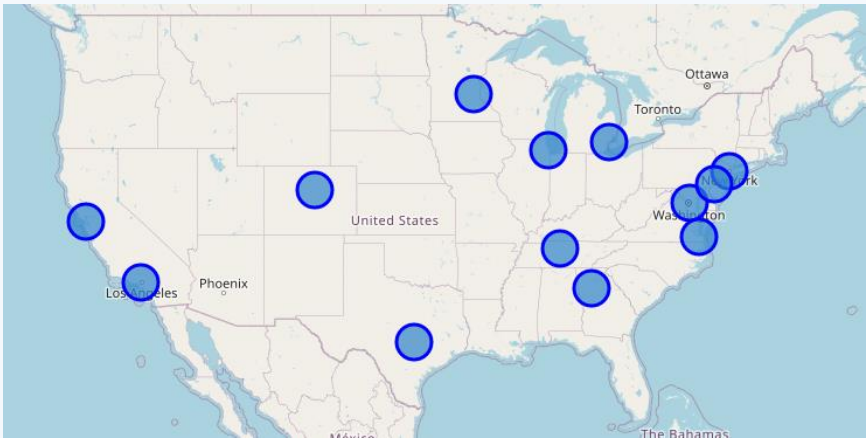
- Coordinate data

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

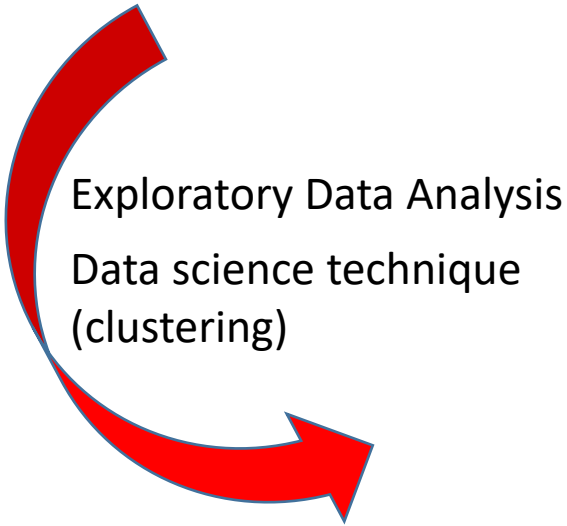
3. The venues data associated with a geographic coordinate is obtained from Foursquare API, in which Venue's name, latitude, longitude, and Category will be given within a specified radius (meter) from the given coordinates.

# Method

## Study Feature Venues Surrounding Famous Live Music Venues in USA



	Name	Location	Latitude	Longitude
0	Red Rocks	Colorado	39.66650	-105.20750
1	Hollywood Bowl	Los Angeles	34.11220	-118.33670
2	Brooklyn Steel	New York City	40.70570	-73.99640
3	Ryman Auditorium	Nashville	36.16120	-86.77840
4	9:30 Club	Washington, D.C.	38.91800	-77.02370
5	First Ave	Minneapolis	44.97800	-93.27590
6	Tower Theater	Philadelphia	39.95258	-75.16522
7	El Club	Detroit	42.33143	-83.04575
8	Stubbs	Austin	30.26667	-97.73333
9	The Fillmore	San Francisco	37.78410	-122.43313
10	The Tabernacle	Atlanta	33.75375	-84.38633
11	The Norva	Norfolk Virginia	36.85077	-76.28587
12	Jay Pritzker Pavilion	Chicago	41.87647	-87.61978



Exploratory Data Analysis  
Data science technique  
(clustering)

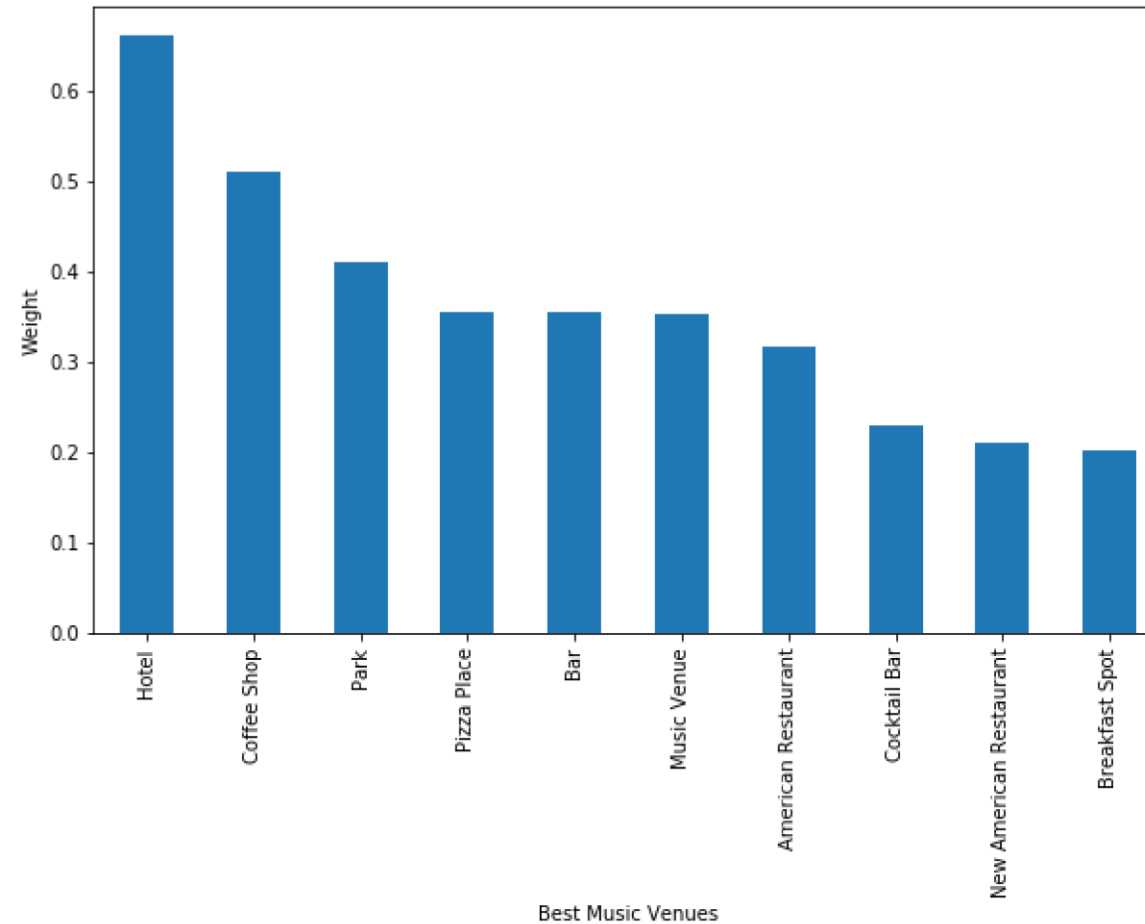
**Suggest Potential Borough and  
the Type of Live Music Venues  
to build in Toronto**



Toronto

# Study Feature Venues Surrounding Famous Live Music Venues (1/6)

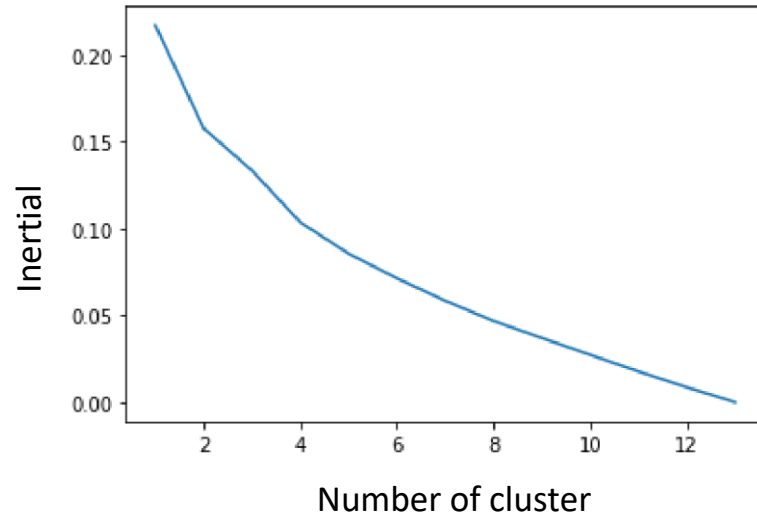
## Feature Venues (overall)



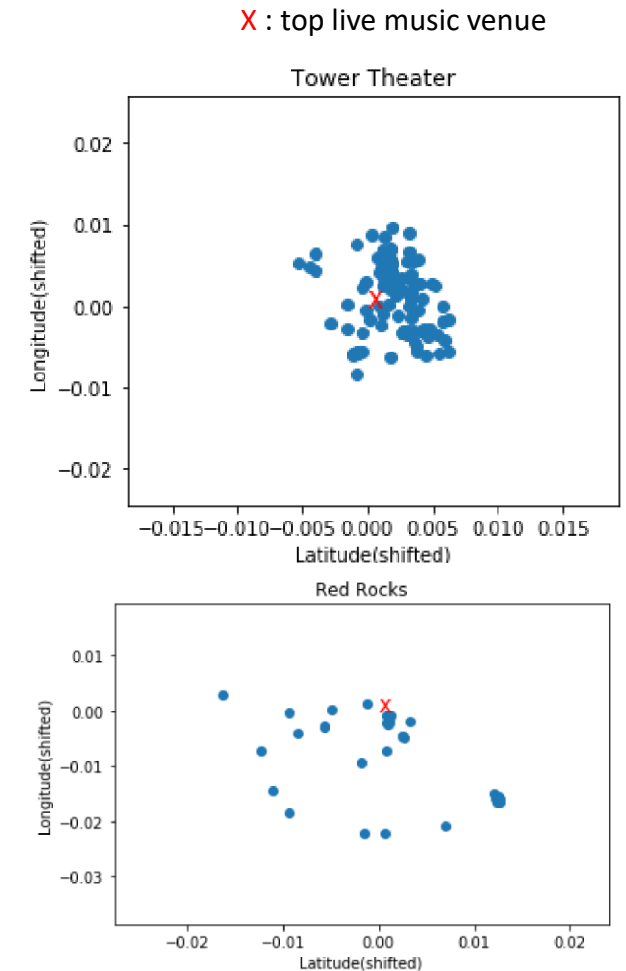
- From analyzing the venues surrounding the world-class live music venues, the types of venues that are keys to the success of a music venue can be revealed.
- Overall, they can be concluded to be **Lodge (Hotel), Drinks(Coffee, bear), Relaxation (Park), and Food (Restaurant).**

# Study Feature Venues Surrounding Famous Live Music Venues (2/6)

## Cluster Analysis



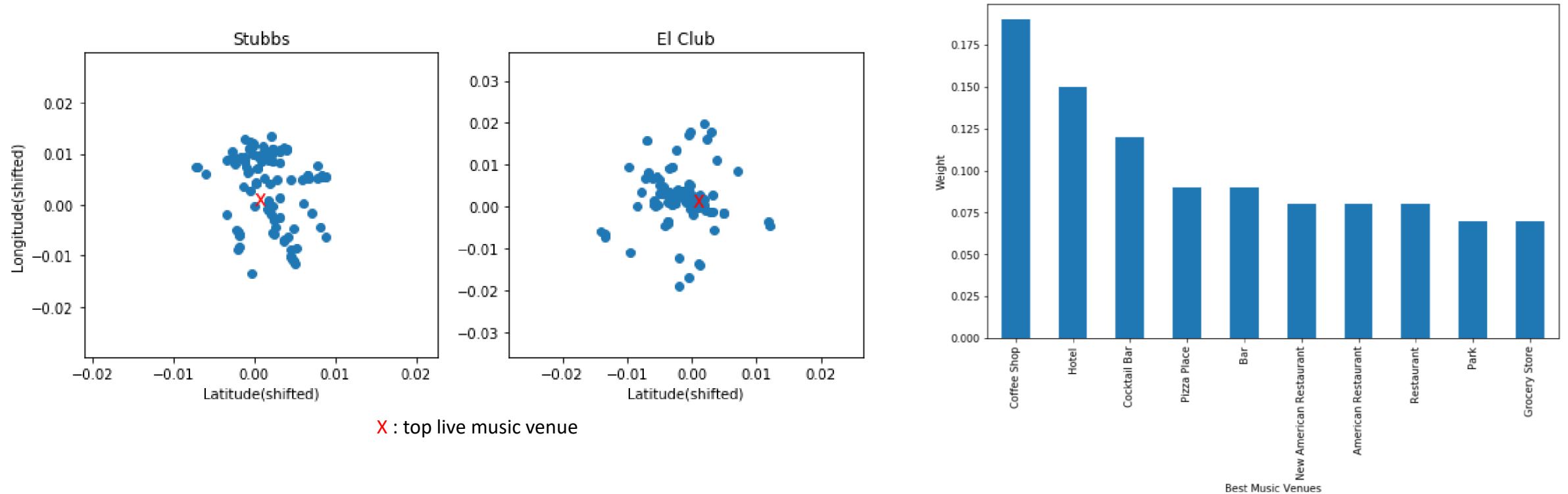
	Best Music Venue	Cluster	D
0	9:30 Club	0	0.008534
1	Brooklyn Steel	1	0.010298
2	El Club	0	0.006663
3	First Ave	1	0.007210
4	Hollywood Bowl	1	0.012992
5	Jay Pritzker Pavilion	1	0.009812
6	Red Rocks	2	0.011063
7	Ryman Auditorium	3	0.004545
8	Stubbs	0	0.008302
9	The Fillmore	1	0.008604
10	The Norva	1	0.010724
11	The Tabernacle	1	0.009104
12	Tower Theater	1	0.005050



- Clustering the best live music venues into 4 group gives a better clustering.
- 4 clusters can be understood by that some music venues are in the rural area while some are in the urban area.
- This can be revealed by the average distance of the surrounding venues from the best music venues (D). The D values of cluster 2 & 1 tend to be larger than cluster 0 & 3.
- The scatter plot of the selected cases also reveals the explanation related to rural and urban area.

# Study Feature Venues Surrounding Famous Live Music Venues (3/6)

## Analysis Cluster 0 (Urban style)

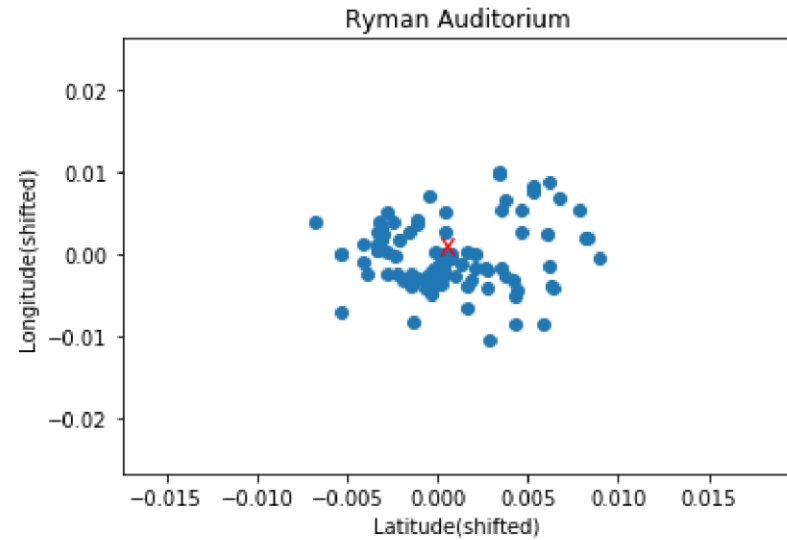


- Selected scatter plots show the best live music venues in the cluster are urban style as the surrounding venues are packed to the live music venues.
- To build this kind of music venue, the coffee shop, hotel, and restaurant in the environment are demanded.

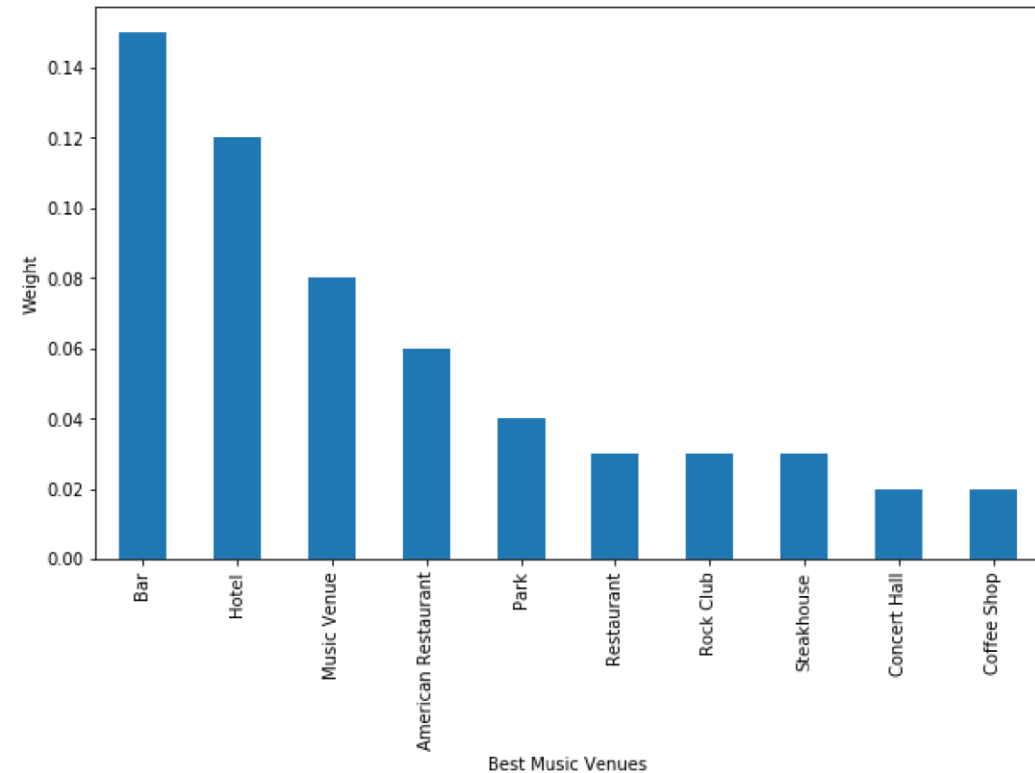


# Study Feature Venues Surrounding Famous Live Music Venues (4/6)

## Analysis Cluster 3 (downtown style)



X : top live music venue

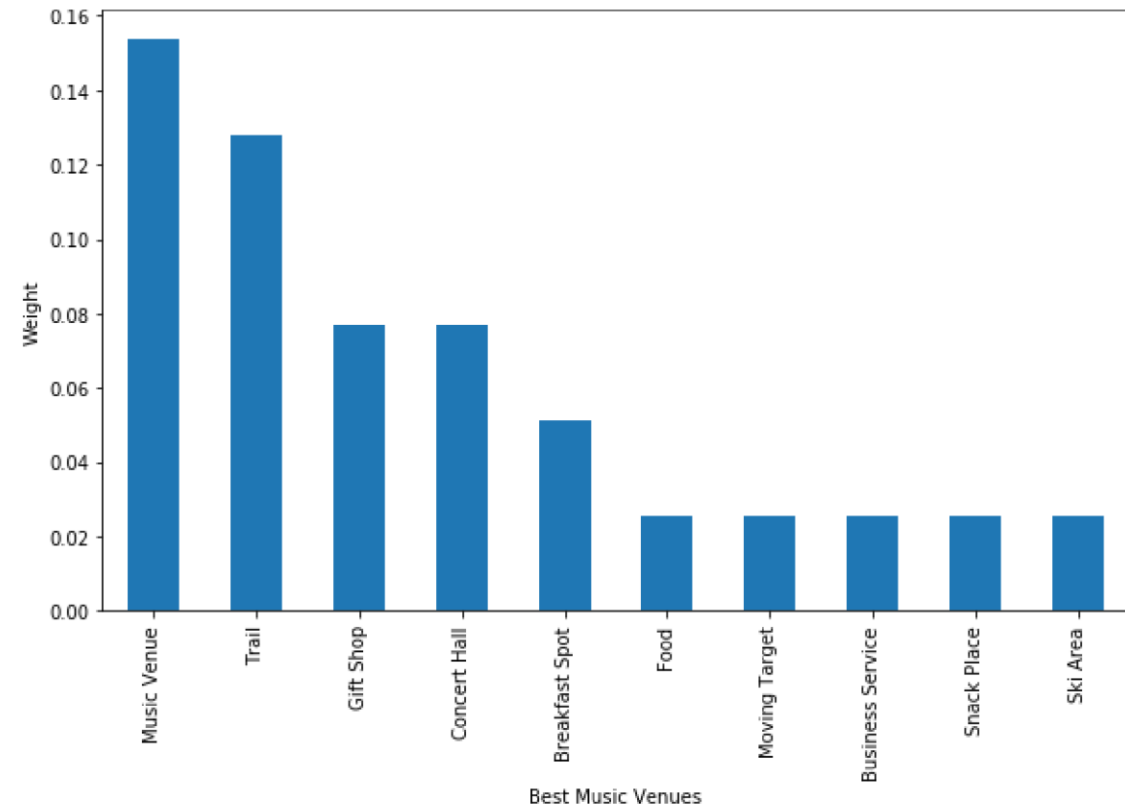
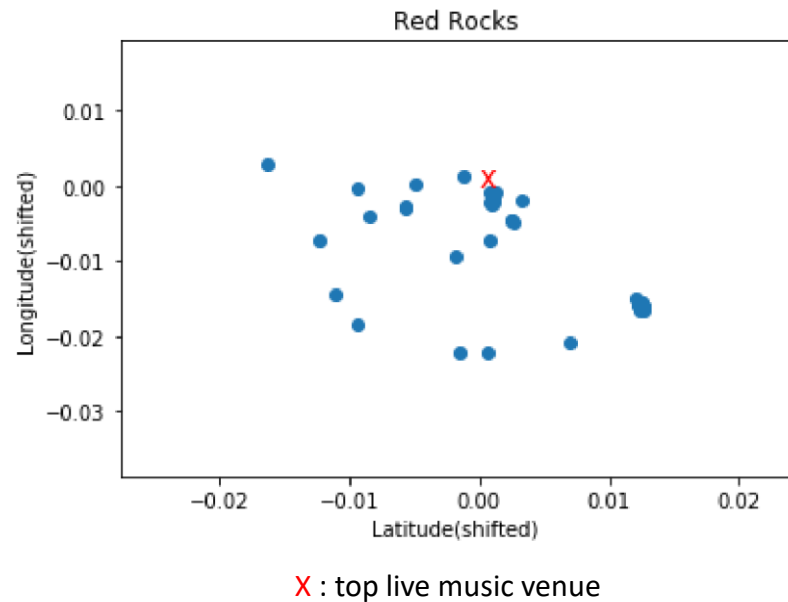


- The best live music venues in the cluster is quite similar to the urban style, and the venues are more closed packed. This is likely to be downtown style.
- To build this kind of music venue, the Bar and hotel are highly demanded.



# Study Feature Venues Surrounding Famous Live Music Venues (5/6)

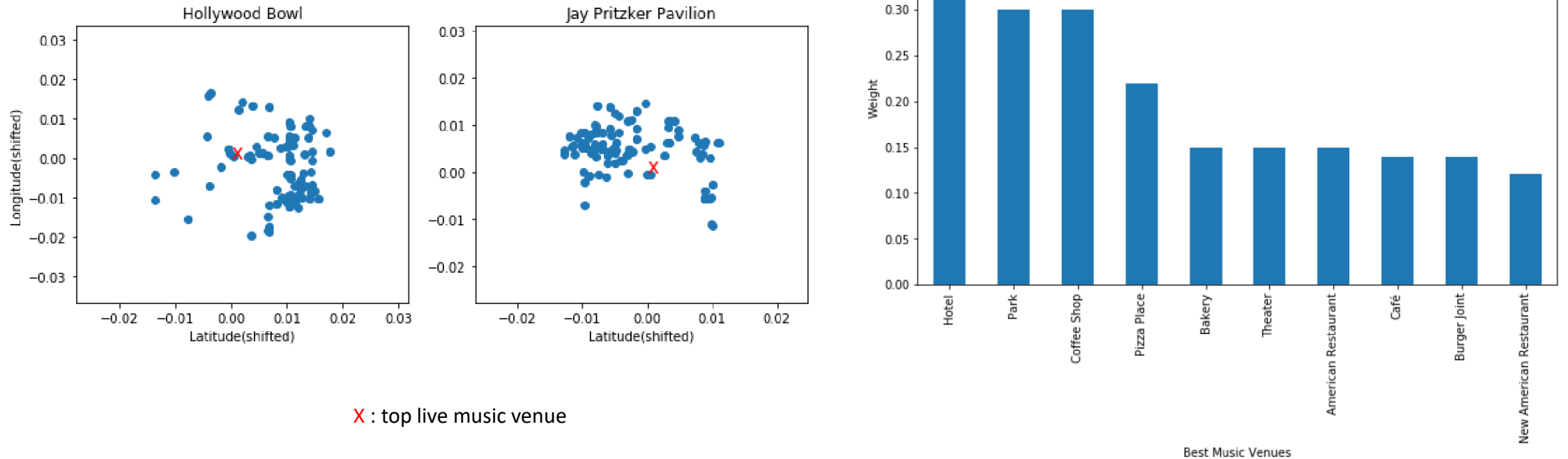
## Analysis Cluster 2 (rural/touring style)



- Scatter plot show the best live music venues in the cluster is in urban style, as surrounding venues are sparse.
- To build this kind of music venue, other music venues are needed as well as trail, shopping place, and restaurant. It can revealed this is like a touring site. In other word, this kind of live music venue is likely located in in or near a touring site or itself is a touring site.

# Study Feature Venues Surrounding Famous Live Music Venues (6/6)

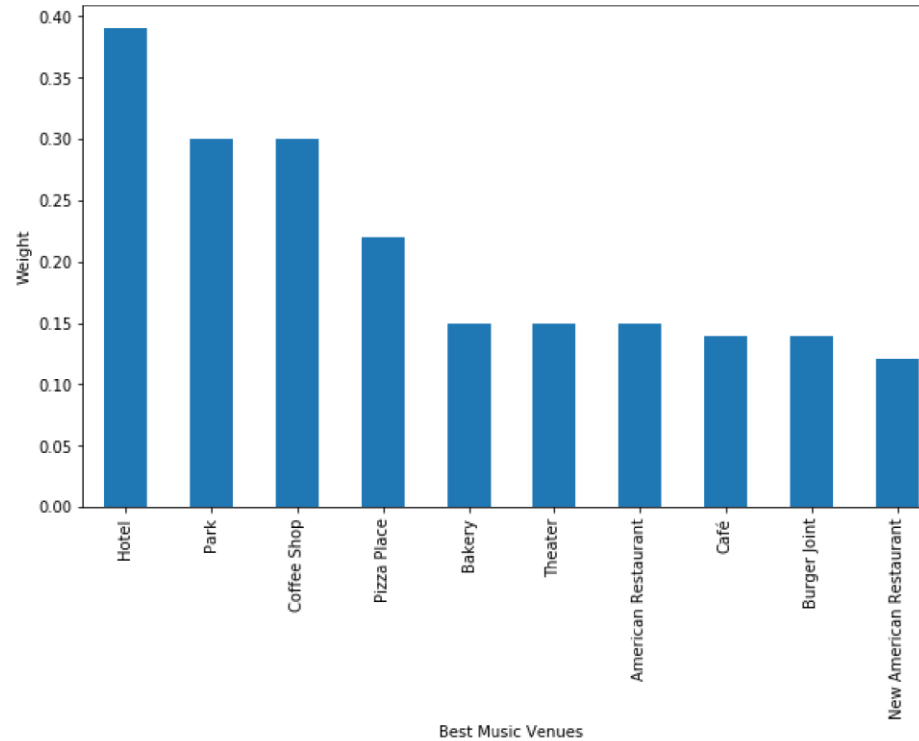
## Analysis Cluster 1 (in-between rural and urban style)



- Selected scatter plots show the best live music venues in the cluster are in-between rural and urban style as fairly dense as well as spare venues in portions of the area
- To build this kind of music venue, a wider kind of venues in the surrounding area are needed, hotel, café, restaurant, park, bakery and theater.

# Suggest Potential Borough and the Type of Live Music Venues to build in Toronto

	Name	Cluster
0	9:30 Club	1
1	Brooklyn Steel	1
2	East York	1
3	El Club	3
4	Etobicoke	1
5	First Ave	3
6	Hollywood Bowl	3
7	Jay Pritzker Pavilion	3
8	North York	1
9	Old Toronto	1
10	Red Rocks	2
11	Ryman Auditorium	0
12	Scarborough	1
13	Stubbs	3
14	The Fillmore	1
15	The Norva	3
16	The Tabernacle	3
17	Tower Theater	3
18	York	1



- We put together the venue information surrounding the top live music venues and the Borough of Toronto. Then, after the cluster analysis, the area with the same venue kinds (feature venues) in the area should be grouped together. This can suggest where in Toronto and what kind of live music venue to develop.
- All Old Toronto, East York, Etobicoke, North York, Scarborough, and York are suitable for live music venue, and style in-between rural and urban should be considered, where coffee shop, hotel, park, and restaurant are welcomed. The stakeholder and the officers can refer to 9:30 Club and Brooklyn Steel for a successful investment.

# Conclusion

- From analyzing the venues surrounding the world-class live music venues, the types of surrounding venues that are keys to the success of a live music venue can be concluded to be **Lodge (Hotel), Drinks(Coffee, beer), Relaxation (Park), and Food (Restaurant)**.
- Two main styles of live music venues are identified: Urban and Rural styles; the surrounding feature venues in the former category mainly contain coffee shop, hotel, bar, restaurant, while park and theater are additional features in the latter category.
- All Old Toronto, East York, Etobicoke, North York, Scarborough, and York are suitable for live music venue, and style in-between rural and urban should be considered, where coffee shop, hotel, park, and restaurant are welcomed. The stakeholder and the officers can refer to 9:30 Club and Brooklyn Steel for a successful investment.