Selecting great event spaces in Toronto, Canada

By Fitsum B. Tilahun

Table of Contents

1. Project description
2. Data requirements
3. Methodology
4. Results
5. Discussion and conclusion

1. Project Description

- Selecting an event space is reported as one of the most important and challenging aspect in event planning
- To optimize event attendance the chosen space Should
  - be appropriate place for the target audience.
  - have facilities that fit the event.
  - consider related factors such as
    - suitable lodging accommodations
    - nearby organic event networking opportunities
    - grant extra convenience like parking spacec

2. Data requirements

Facility dataset

https://www.toronto.ca/city-government/data-research-maps/open-data.

The fields in the dataset are: FACILITY NAME, Full Address, Street #, Street Name, Suite, City, Province, Postal Code, Ward, type of space and ownership of facilities.

Neighborhood data

scrapped form a Wikipedia page at https://en.wikipedia.org/wiki/List_of_postal_codes_of_Canada:_M c

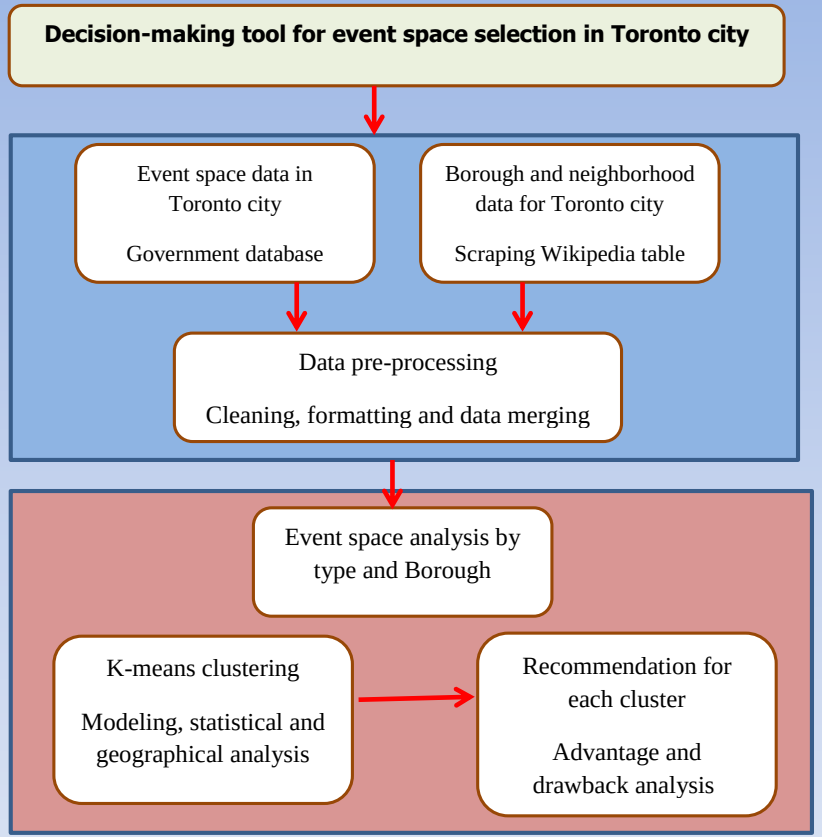
Venues data

FourSquare API interface

3. Methodology

- The first part of the methodology deals with data wrangling and preprocessing to make it suitable for the next stage.
  - Location information would be made to Foursquare API server as HTTP requests using zip codes of the Toronto city streets.
  - Foursquare API search feature would then be used to gather relevant information regarding nearby venues of the city streets.
  - The http request limitations are considered.
- Unsupervised K-mean clustering algorithm is later used for modeling.
  - Folium is used to visualize the street venue cluster over an interactive map.
- The clusters from the modeling provide insights for selecting great venues and draw conclusions.

Fig. 1. Structure of the decision-making tool for event space selection in Toronto city



3.1 data preprocessing: load the main dataset

	FACILITY NAME	Full Address	Street #	Street Name	Suite	City	Province	Postal Code	Ward	Performance	Exhibition / Visual Arts	Screen Based	Library	Multipurpose	Heritage	OWNERSHIP
0	Thistletown CC	925 Albion Road, Toronto, ON	925	Albion Road	0	Toronto	ON	M9V	1	1.0	0.0	0.0	0.0	1.0	0.0	City Operated
1	Albion Pool & Health Club	1485 Albion Road, Toronto, ON	1485	Albion Road	0	Toronto	ON	M9V	1	0.0	0.0	0.0	0.0	1.0	0.0	City Owned
2	Albion Branch (TPL)	1515 Albion Road, Toronto, ON	1515	Albion Road	0	Toronto	ON	M9V	1	1.0	0.0	0.0	1.0	1.0	0.0	City Operated

3.1. data preprocessing: scrapped neighborhood data from a Wikipedia page

	Postal Code	Borough	Neighbourhood
0	M1B	Scarborough	Rouge,Malvern
1	M1C	Scarborough	Highland Creek,Rouge Hill,Port Union
2	M1E	Scarborough	Guildwood,Morningside,West Hill
3	M1G	Scarborough	Woburn
4	M1H	Scarborough	Cedarbrae

3.1. data preprocessing: merge the two datasets

	FACILITY NAME	Full Address	Postal Code	Performance	Exhibition / Visual Arts	Screen Based	Library	Multipurpose	Borough	Neighbourhood	Latitude	Longitude
0	Thistletown CC	925 Albion Road, Toronto, Ontario	M9V	1.0	0.0	0.0	0.0	1.0	Etobicoke	Albion Gardens,Beaumond Heights,Humbergate,Jam...	43.735450	-79.562527
1	Albion Pool & Health Club	1485 Albion Road, Toronto, Ontario	M9V	0.0	0.0	0.0	0.0	1.0	Etobicoke	Albion Gardens,Beaumond Heights,Humbergate,Jam...	43.739613	-79.580608
2	Albion Branch (TPL)	1515 Albion Road, Toronto, Ontario	M9V	1.0	0.0	0.0	1.0	1.0	Etobicoke	Albion Gardens,Beaumond Heights,Humbergate,Jam...	43.739871	-79.584810
4	Humber Arboretum Gardens	203 Humber College Boulevard, Toronto, Ontario	M9W	0.0	0.0	0.0	0.0	1.0	Etobicoke	Northwest	43.744627	-79.583575
5	Thistletown Baptist Church	2534 Kipling Avenue, Toronto, Ontario	M9V	0.0	0.0	0.0	0.0	1.0	Etobicoke	Albion Gardens,Beaumond Heights,Humbergate,Jam...	43.747668	-79.586106

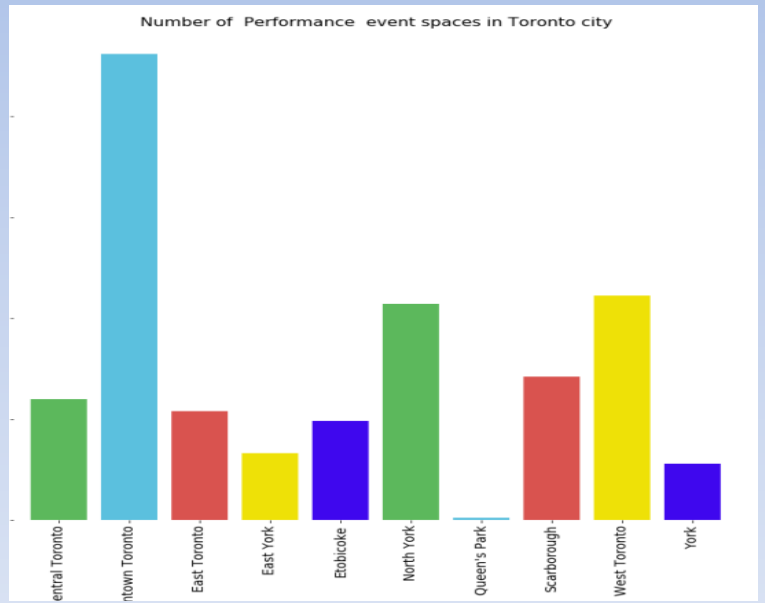
3.1. data preprocessing: explore the datasets

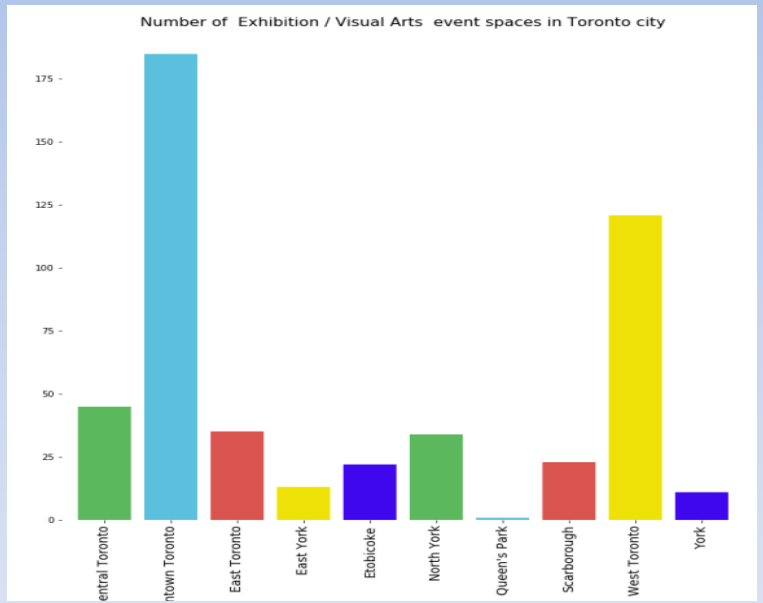
Number of different event space types in each neighborhood and borough.

Borough	Performance	Exhibition / Visual Arts	Screen Based	Library	Multipurpose
Central Toronto	60.0	45.0	8.0	8.0	45.0
Downtown Toronto	231.0	185.0	55.0	10.0	154.0
East Toronto	54.0	35.0	11.0	8.0	47.0
East York	33.0	13.0	1.0	5.0	31.0
Etobicoke	49.0	22.0	6.0	13.0	60.0
North York	107.0	34.0	6.0	18.0	97.0
Queen's Park	1.0	1.0	0.0	0.0	1.0
Scarborough	71.0	23.0	4.0	21.0	102.0
West Toronto	111.0	121.0	21.0	10.0	79.0
York	28.0	11.0	0.0	6.0	41.0

3.1. data preprocessing: explore the datasets

a comparative analysis of the distribution of event space types for each borough (performance VS exhibition space)





3.2. Spatial clustering for great event spaces

- For the sake of illustration, let’s focus on “Multipurpose” facilities in Etobicoke borough
  - This resulted in 60 available facilities.
- Next, let's get the location of each event space using Nominatim().
  - Then the resulting dataset is merged to the selected facilities dataset and cleaned to keep the relevant terms.
- Folium is used to create a map of Toronto with the facilities’ location superimposed on top

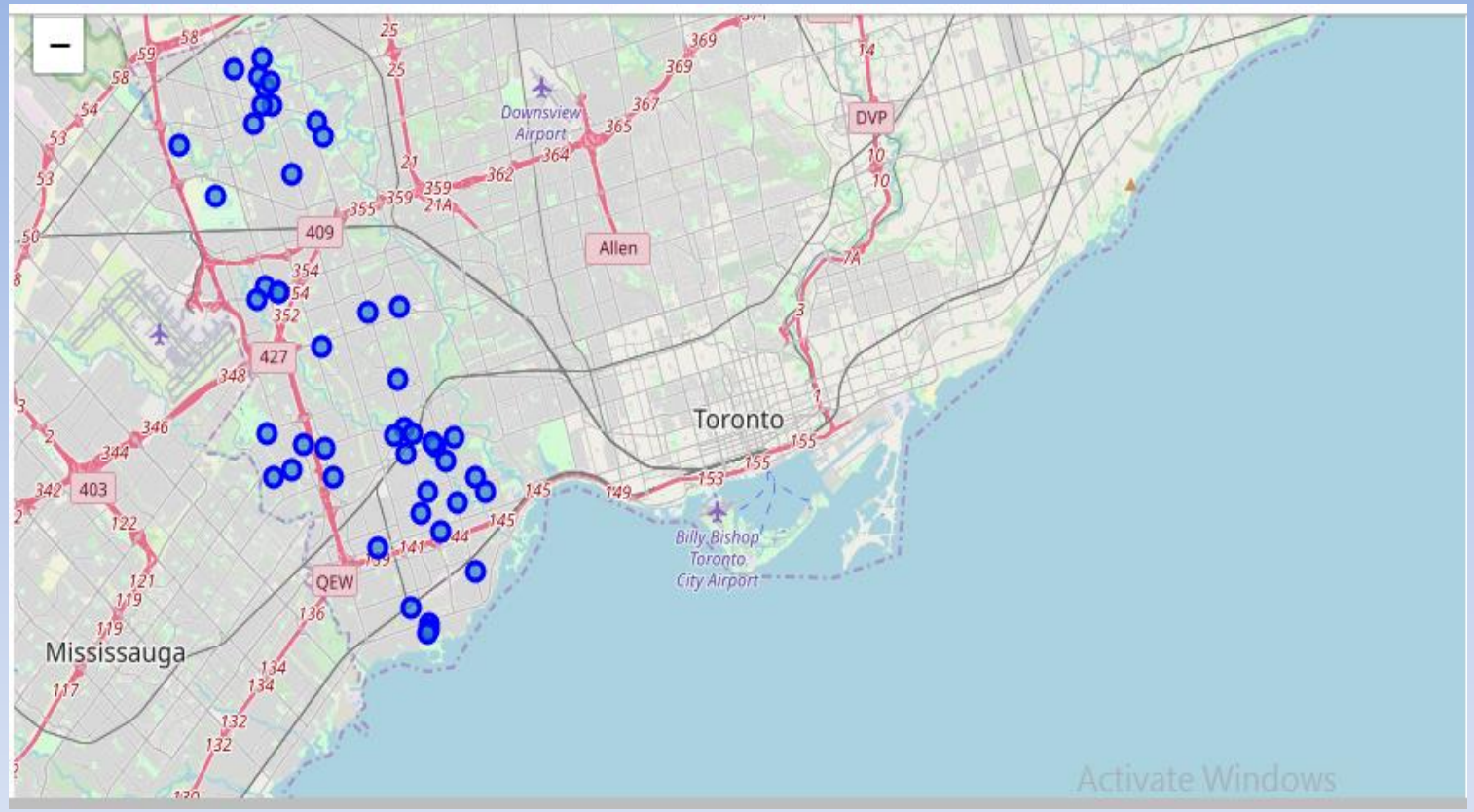
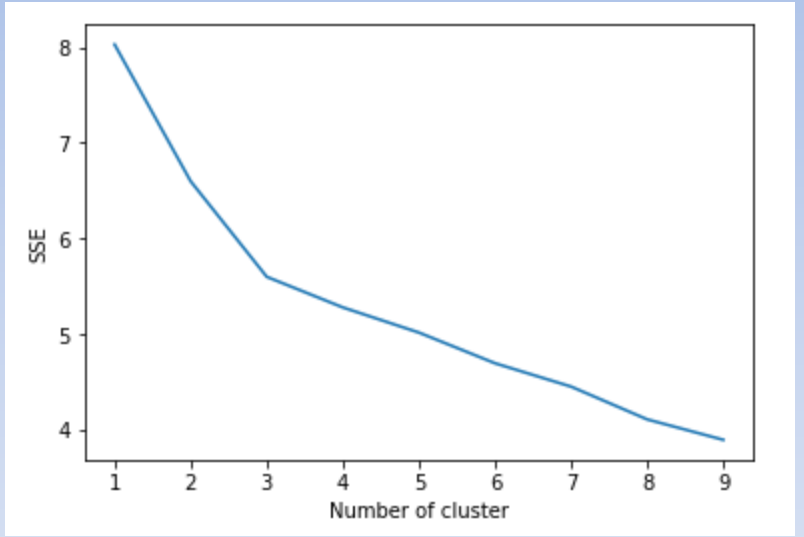


Fig. 3 map of Toronto with the facilities' location superimposed on top

3.2. Optimum number of clusters: The Elbow method

- indicates the optimum number of clusters in a dataset.
- explains and validate the consistency of cluster analysis.
- It does this by evaluating the percentage of variance given as a function of the number of clusters.
- The programmer then select the number of clusters in such a way that adding another cluster doesn't improve the cluster modeling of the data (three in our case)



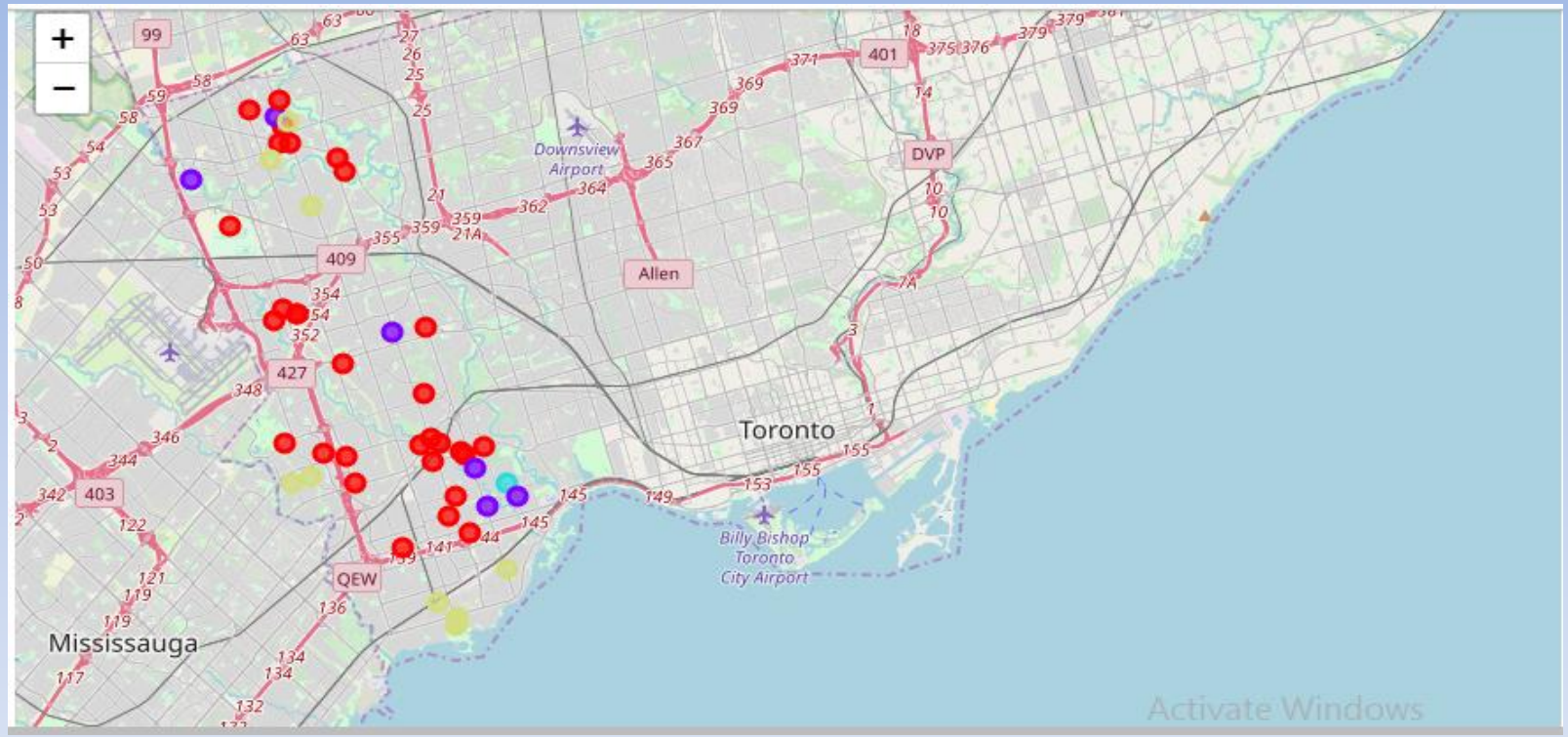


Fig. 5 Clustering of venues nearby event space facilities

4. results

Cluster 1: These event spaces are suitable for:

- Celebrations
- Receptions,
- Small-scale live performance
- Cocktail and dinner parties

Key characteristics of cluster 1:

- Extra convenience and increased access to resource to participants
- Availability of rooms for rent and nearby restaurants
- Modern architectures add coziness and intimate feeling to event attendees.
- There might be parking constraint as it is the most eventful venue

4. results

Cluster 2: These event spaces are suitable for:

- Luncheons
- Conferences
- Workshops
- Networking
- Team building
- Live music

Key characteristics of cluster 2:

- Usher a mix of socializing and business atmosphere
- Diversity of popular venues that can be provide customizable event space
- Popular venues have several social hubs that could facilitate organic networking

4. results

Cluster 3: These event spaces are suitable for:

- Company retreats
- Fund raisers
- Corporate meetings
- Galas
- Themed parties
- Private performance

Key characteristics of cluster 3:

- Less eventful venues that are dominated by parks, home services and auto workshops
- Venues best reached by car since there is low density of public transport
- There is however ample parking space

4. Discussion and conclusion

- An effort has been made to facilitate decision regarding even space in Toronto city.
- it was also possible to analyze the results according to three optimum clusters.
  - The Clusters gave out popular venues that could help achieve great event space.
  - One could see, that a pattern emerges in direct relation to the busy-ness of the venue and the type of services available.
- In conclusion, emerging patterns in cluster could be used as a prime indicators to select great venue spaces that facilitated decision for event coordinators.

Thank you!