

Analysis of Toronto Neighborhoods by Available Sports and Recreational Facilities

April 1, 2021

1. Introduction

- ▶ For most people moving to a new home, choosing the appropriate neighborhood is one of the most important things to think about. One thing a person must consider is the availability of different establishments and amenities within the area. For sporty or physically active people, having facilities such as a Basketball Court or a Yoga Studio is important sometimes even necessary.
- ▶ What we would like to answer in this project is what neighborhoods are the most ideal place for a person who is physically active to live in? Furthermore, we would like to see which neighborhoods are similar in terms of the sports and recreational facilities that they can provide. For this project we would be considering all the neighborhoods in the City of Toronto.

2. Data

- To solve the problem, data of all nearby venues for each neighborhood in Toronto will be extracted. Since the venues of interest are sports and recreational venues, only a portion of the Foursquare data will be used.

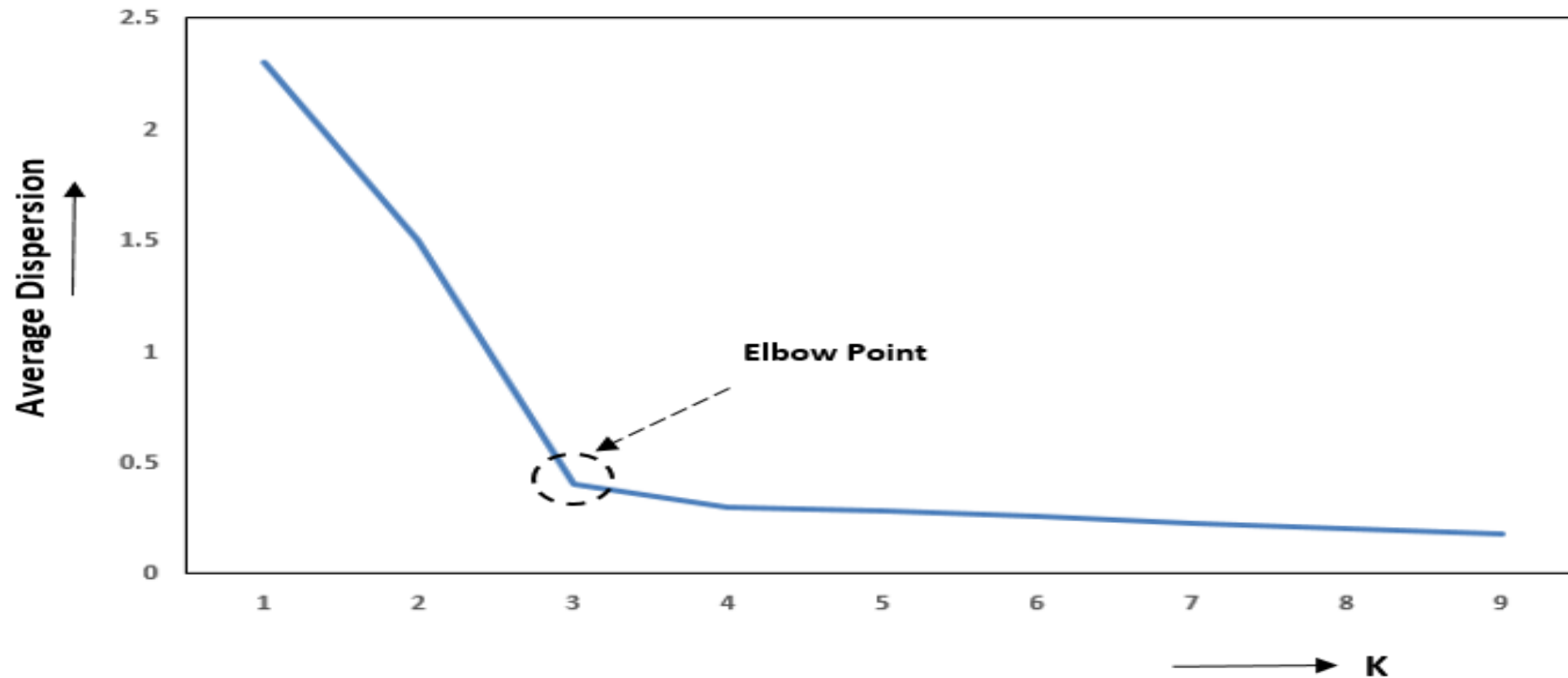
Out[6]:

| | Neighborhood | Athletics & Sports | Baseball Field | Baseball Stadium | Basketball Court | Basketball Stadium | Beach | Climbing Gym | College Gym | College Rec Center | College Stadium | Curling Ice | Dance Studio | Dog Run | Escape Room | Field c |
|---|---|-----------------------|-------------------|---------------------|---------------------|-----------------------|----------|-----------------|----------------|--------------------------|--------------------|----------------|-----------------|------------|----------------|---------|
| 0 | Agincourt | 0.000 | 0.0 | 0.0 | 0.0 | 0.000000 | 0.000000 | 0.000000 | 0.0 | 0.0 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 1 | Alderwood, Long Branch | 0.125 | 0.0 | 0.0 | 0.0 | 0.000000 | 0.000000 | 0.000000 | 0.0 | 0.0 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 2 | Bathurst Manor, Wilson Heights, Downsview North | 0.000 | 0.0 | 0.0 | 0.0 | 0.000000 | 0.000000 | 0.000000 | 0.0 | 0.0 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 3 | Bayview Village | 0.000 | 0.0 | 0.0 | 0.0 | 0.000000 | 0.000000 | 0.000000 | 0.0 | 0.0 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

3. Methodology

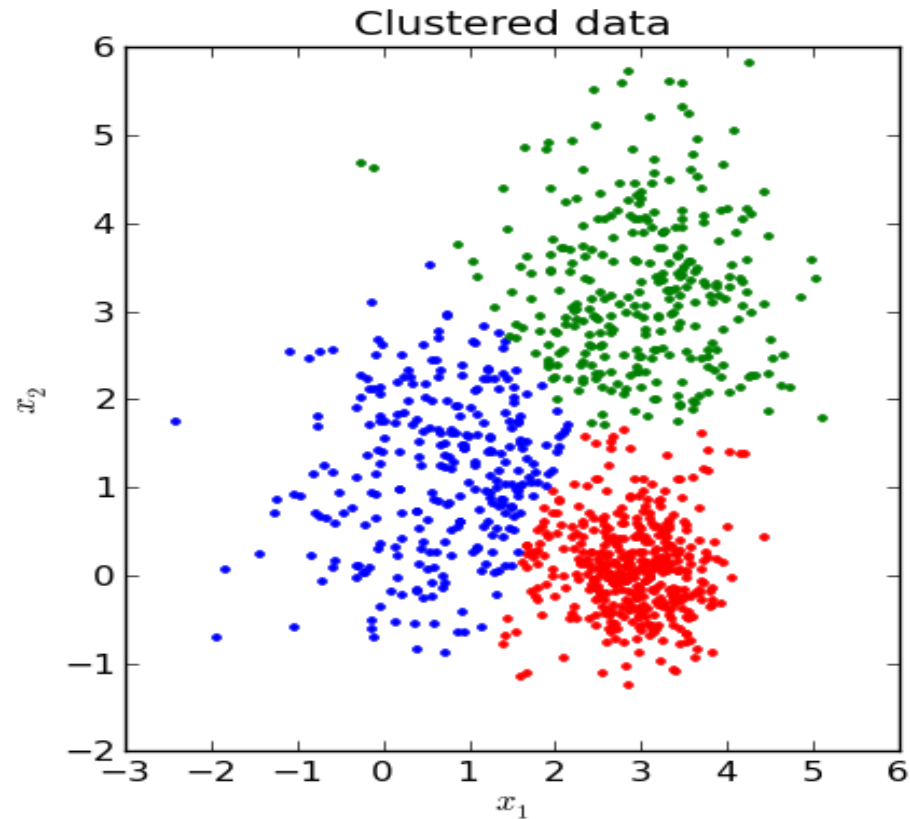
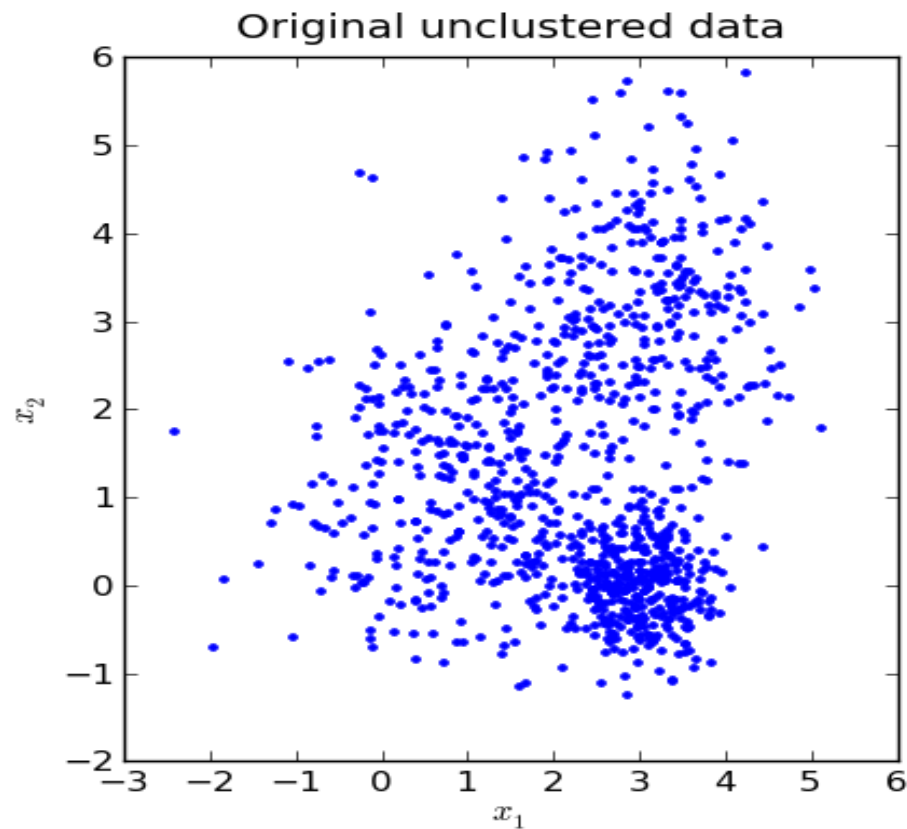
► Elbow Method

Elbow Method for selection of optimal “K” clusters



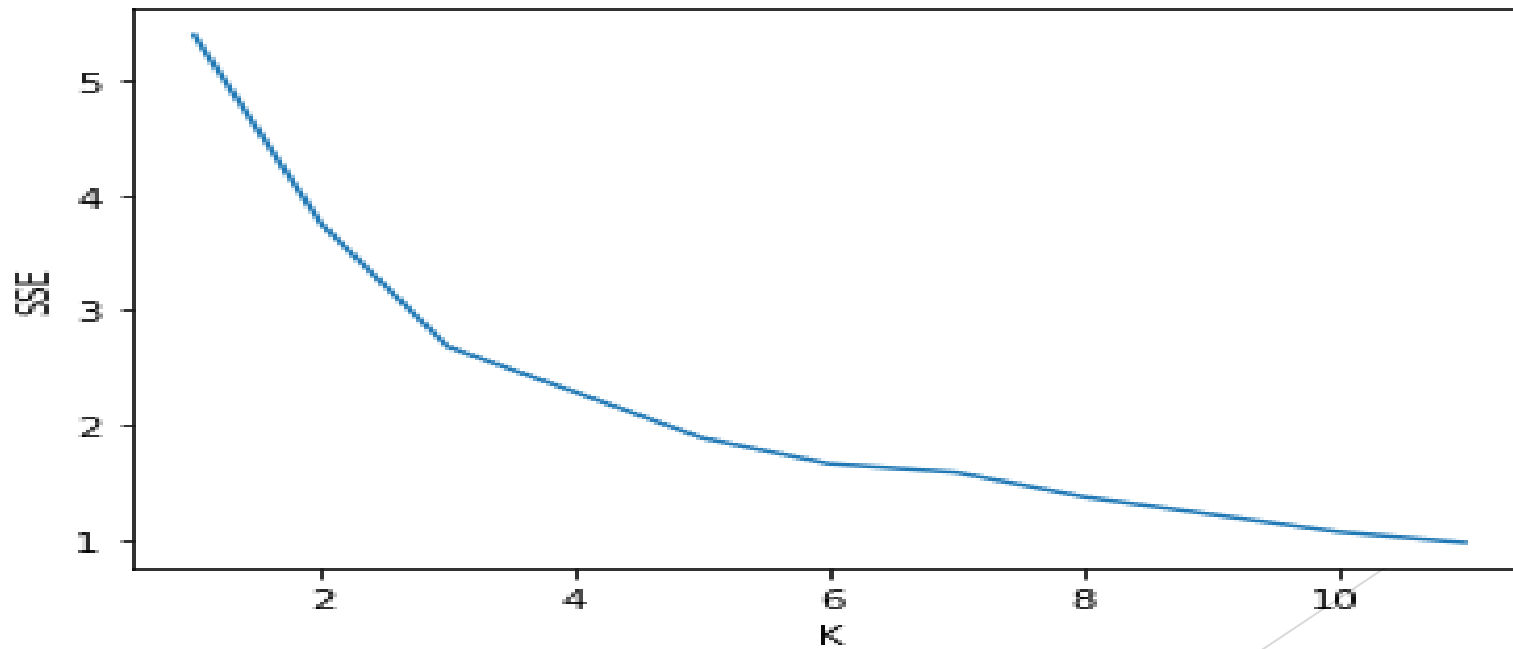
3. Methodology

► Cluster Analysis

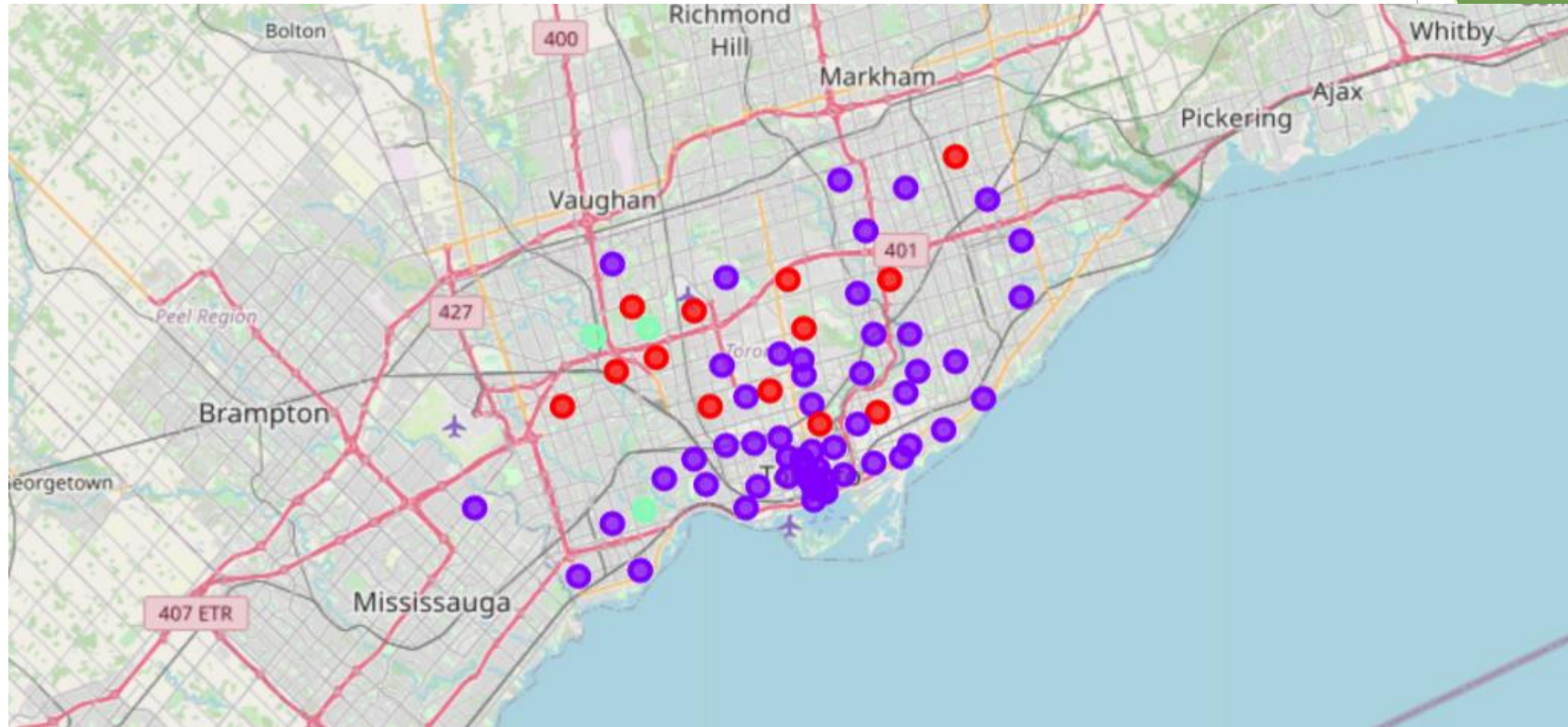


4. Results

- Upon inspection of the data, 29 of the 100 neighborhoods listed have no nearby sports or recreational facility. We decided to remove these 29 neighborhoods so that they will not affect the cluster analysis.
- Based on the plot below, the most optimal K to use is K=3.



Cluster Map



Cluster 1: Park Cluster

| | Borough | 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 | North York | 0.0 | Park | Yoga Studio | Field | Baseball Field | Baseball Stadium | Basketball Court | Basketball Stadium | Beach | Climbing Gym | College Gym |
| 21 | York | 0.0 | Park | Pool | Yoga Studio | Dog Run | Dance Studio | Curling Ice | College Stadium | College Rec Center | College Gym | Climbing Gym |
| 35 | East York/East Toronto | 0.0 | Park | Yoga Studio | Field | Baseball Field | Baseball Stadium | Basketball Court | Basketball Stadium | Beach | Climbing Gym | College Gym |
| 40 | North York | 0.0 | Park | Yoga Studio | Field | Baseball Field | Baseball Stadium | Basketball Court | Basketball Stadium | Beach | Climbing Gym | College Gym |
| 46 | North York | 0.0 | Park | Yoga Studio | Field | Baseball Field | Baseball Stadium | Basketball Court | Basketball Stadium | Beach | Climbing Gym | College Gym |
| 49 | North York | 0.0 | Basketball Court | Park | Yoga Studio | Field | Baseball Field | Baseball Stadium | Basketball Stadium | Beach | Climbing Gym | College Gym |
| 61 | Central Toronto | 0.0 | Park | Swim School | Yoga Studio | Dog Run | Dance Studio | Curling Ice | College Stadium | College Rec Center | College Gym | Climbing Gym |
| 64 | York | 0.0 | Park | Yoga Studio | Field | Baseball Field | Baseball Stadium | Basketball Court | Basketball Stadium | Beach | Climbing Gym | College Gym |

Cluster 2: Variety Cluster

| | Borough | 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 |
|---|------------------|----------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|------------------------|
| 1 | North York | 1.0 | Hockey Arena | Yoga Studio | Field | Baseball Field | Baseball Stadium | Basketball Court | Basketball Stadium | Beach | Climbing Gym | College Gym |
| 2 | Downtown Toronto | 1.0 | Park | Yoga Studio | Gym / Fitness Center | Dog Run | Dance Studio | Curling Ice | College Stadium | College Rec Center | College Gym | Field |
| 4 | Queen's Park | 1.0 | Yoga Studio | Park | Gym | Dog Run | Dance Studio | Curling Ice | College Stadium | College Rec Center | College Gym | Field |
| 7 | North York | 1.0 | Gym | Yoga Studio | Field | Baseball Field | Baseball Stadium | Basketball Court | Basketball Stadium | Beach | Climbing Gym | College Gym |
| 8 | East York | 1.0 | Athletics & Sports | Gym / Fitness Center | Field | Baseball Field | Baseball Stadium | Basketball Court | Basketball Stadium | Beach | Climbing Gym | College Gym |

Cluster 3: Baseball Cluster

Out[20]:

| | Borough | 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 |
|-----|------------|----------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|------------------------|
| 53 | North York | 2.0 | Baseball Field | Yoga Studio | Trail | Baseball Stadium | Basketball Court | Basketball Stadium | Beach | Climbing Gym | College Gym | College Rec Center |
| 57 | North York | 2.0 | Baseball Field | Yoga Studio | Trail | Baseball Stadium | Basketball Court | Basketball Stadium | Beach | Climbing Gym | College Gym | College Rec Center |
| 101 | Etobicoke | 2.0 | Baseball Field | Yoga Studio | Trail | Baseball Stadium | Basketball Court | Basketball Stadium | Beach | Climbing Gym | College Gym | College Rec Center |

5. Discussion

- ▶ In the very beginning of our analysis, we have already seen that there are 29 out of the 100 neighborhoods we checked that have no nearby sports and/or recreational venues. We can safely say that this 29 neighborhoods are not ideal for Physically Active people and/or families.
- ▶ Among the 3 clusters that we were able to derive, the “Variety Cluster” has the most variety when it comes to available amenities. This cluster of neighborhoods would be good enough for people who do not have a particular sport or activity in mind and is ok with any physical activity.
- ▶ Cluster 1 or the “Park Cluster” would be ideal for people who enjoy parks or any outdoor activity. There are plenty of activities that can be done in parks such as jogging, walking, biking or outdoor exercise. Furthermore, parks can be enjoyed by people of all ages. Thus, this cluster would be suitable for families who are physically active since all members of the family can easily participate in Park activities.
- ▶ The last cluster is the “Baseball Cluster” which has Baseball Fields as the most common sports venue. This cluster would be ideal for people and families who enjoy playing or watching baseball.

6. Conclusion

- ▶ In conclusion, there are many neighborhoods in Toronto that are ideal for physically active or sporty families. Among the 100 Neighborhoods observed, 29 are not ideal for physically active or sporty families as they do not have any nearby sports or recreational venues. The result of our analysis is that 3 clusters is optimal. The three clusters that we have created are labelled as the Park Cluster, Variety Cluster and Baseball Clusters. Park Cluster is ideal for Physically Active Families while the Baseball Cluster is ideal for any Baseball loving individuals or families. The Variety Cluster is ideal for anyone who do not have a particular sport or physical activity in mind as they have a variety of available sports or recreational venues.