The Battle of the Neighborhoods

Finding the most suitable residential neighborhood for families with children in Toronto, Canada

An overview

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Introduction

- Deciding where to stay is challenging. Especially so for families with children
- A suitable location should have at least the following:
  - access to food and grocery stores
  - schools which can offer the best education for their children
- This research attempts to find the most suitable neighborhood for families with children and help them to make informed decision on where to stay in Toronto, Canada

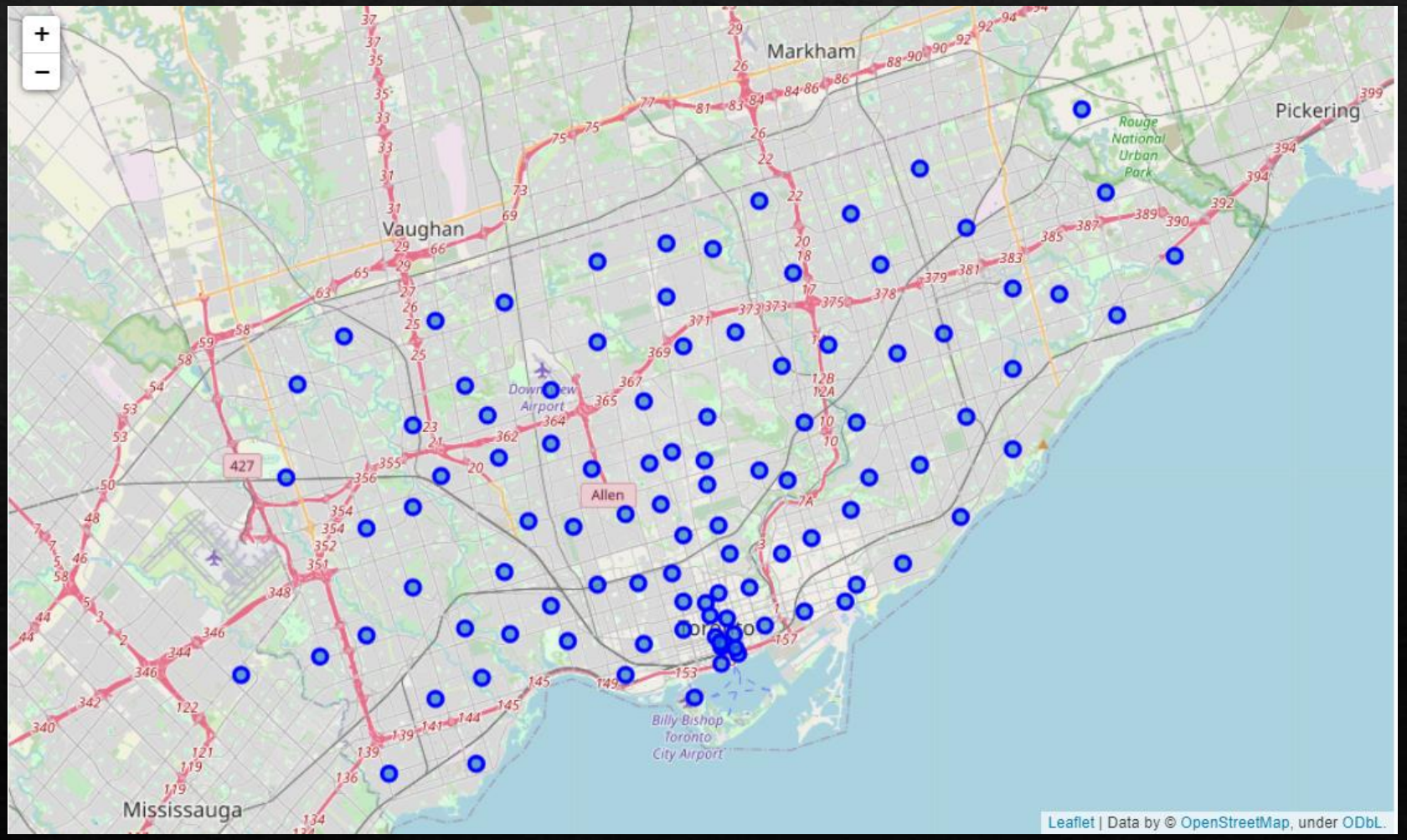
Data

- Built a dataset of postal code, boroughs and neighborhoods in Toronto with data scraped from https://en.wikipedia.org/wiki/List_of_postal_codes_of_Canada:_M
- Added latitude and longitude coordinates to the dataset using GeoPy
- Compiled a dataset of venues in the neighborhoods using Foursquare API

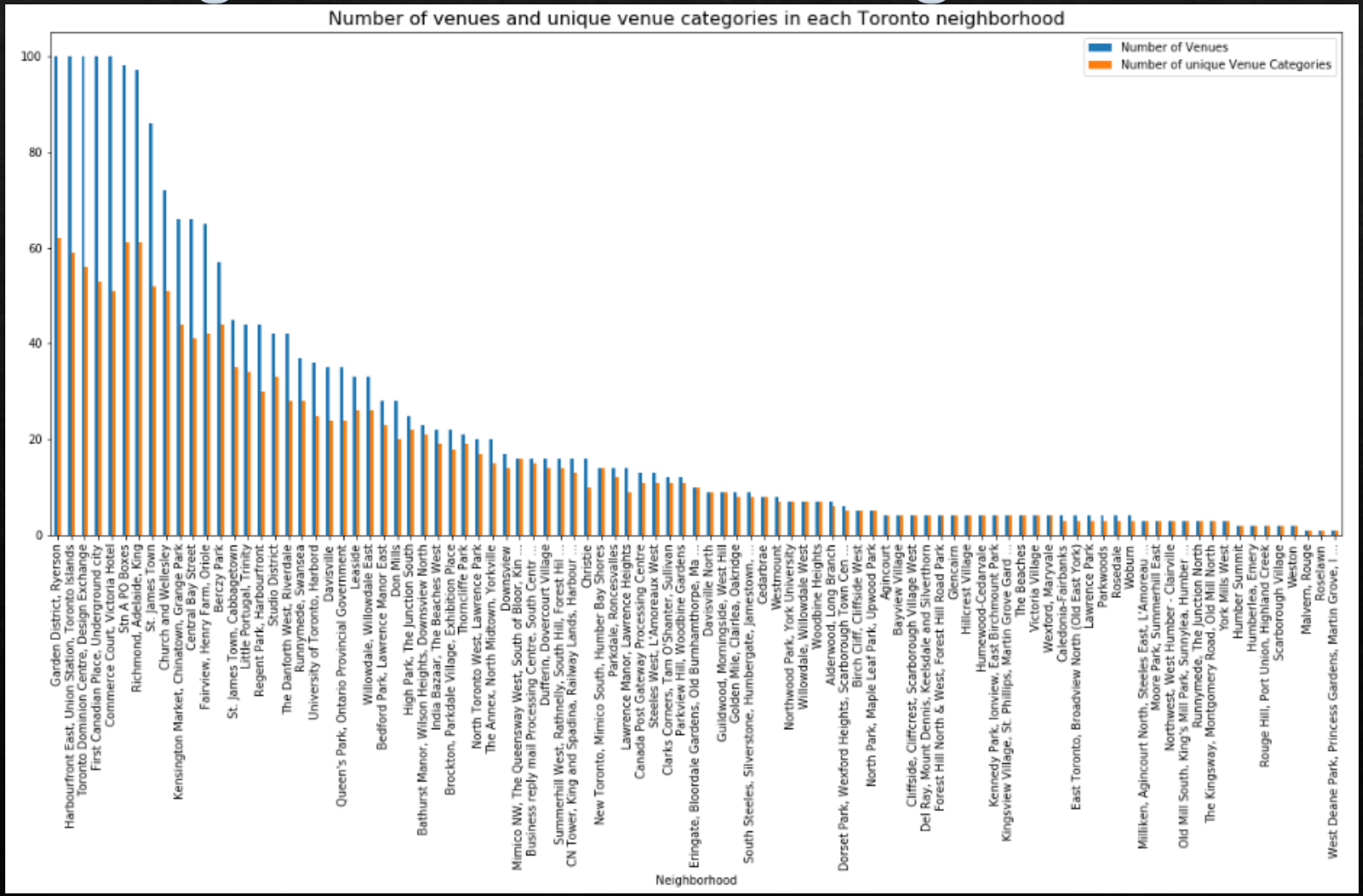
Methodology

- Removed duplicates and invalid data from the datasets
- Retrieved a maximum of 100 venues per neighborhood and within 500m radius from the latitude and longitude coordinates of the neighborhood from Foursquare
- Performed K-Means clustering, a popular unsupervised machine learning algorithm to find any natural grouping of neighborhoods based on the venues
- Used one hot encoding to prepare dataset for analysis

Map of neighborhoods in Toronto with clusters



The number of venues and unique venue categories in each neighborhood



Results

K-Means with optimal K=5 based on Elbow method

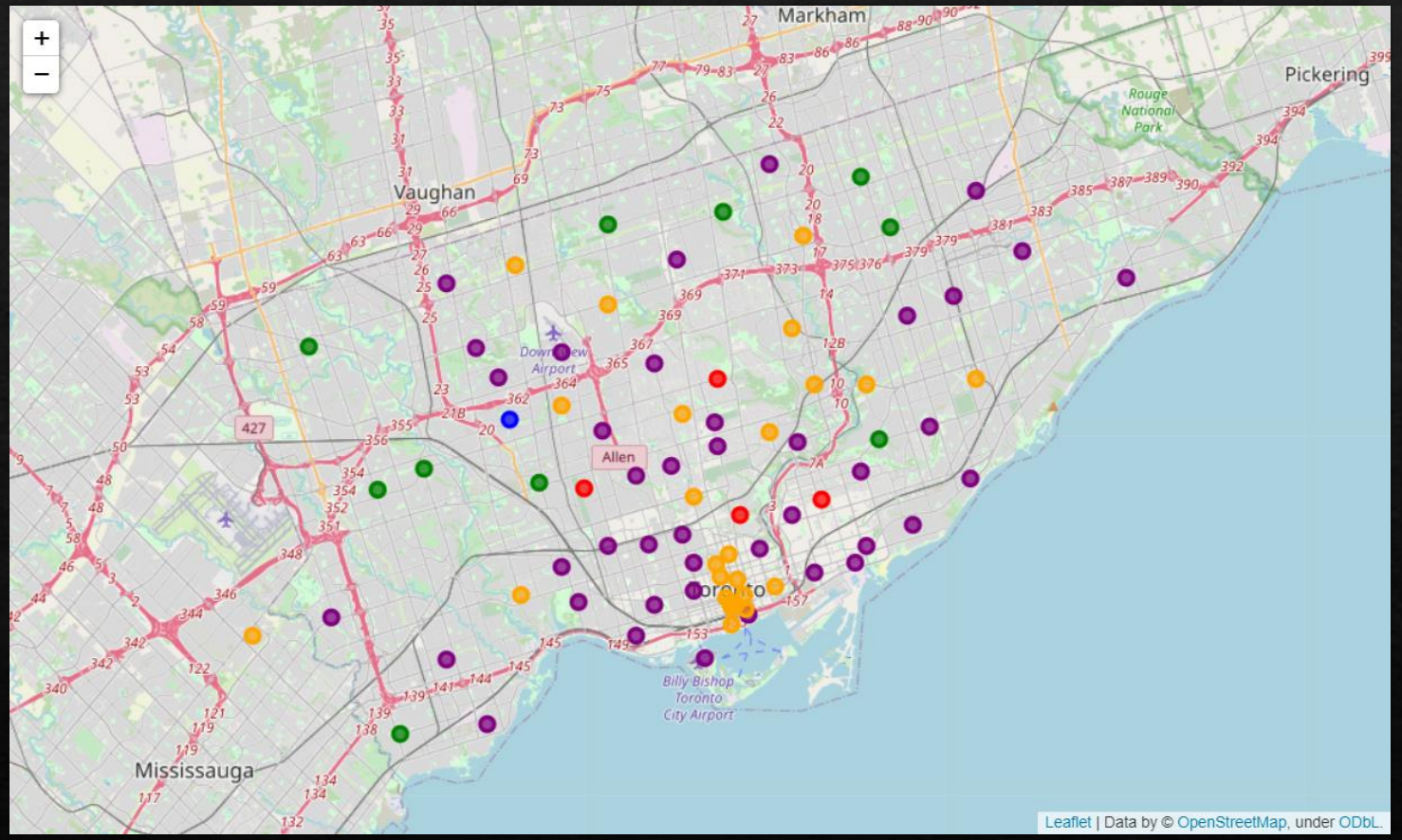
Cluster 0 – Yellow

Cluster 1 – Red

Cluster 2 – Blue

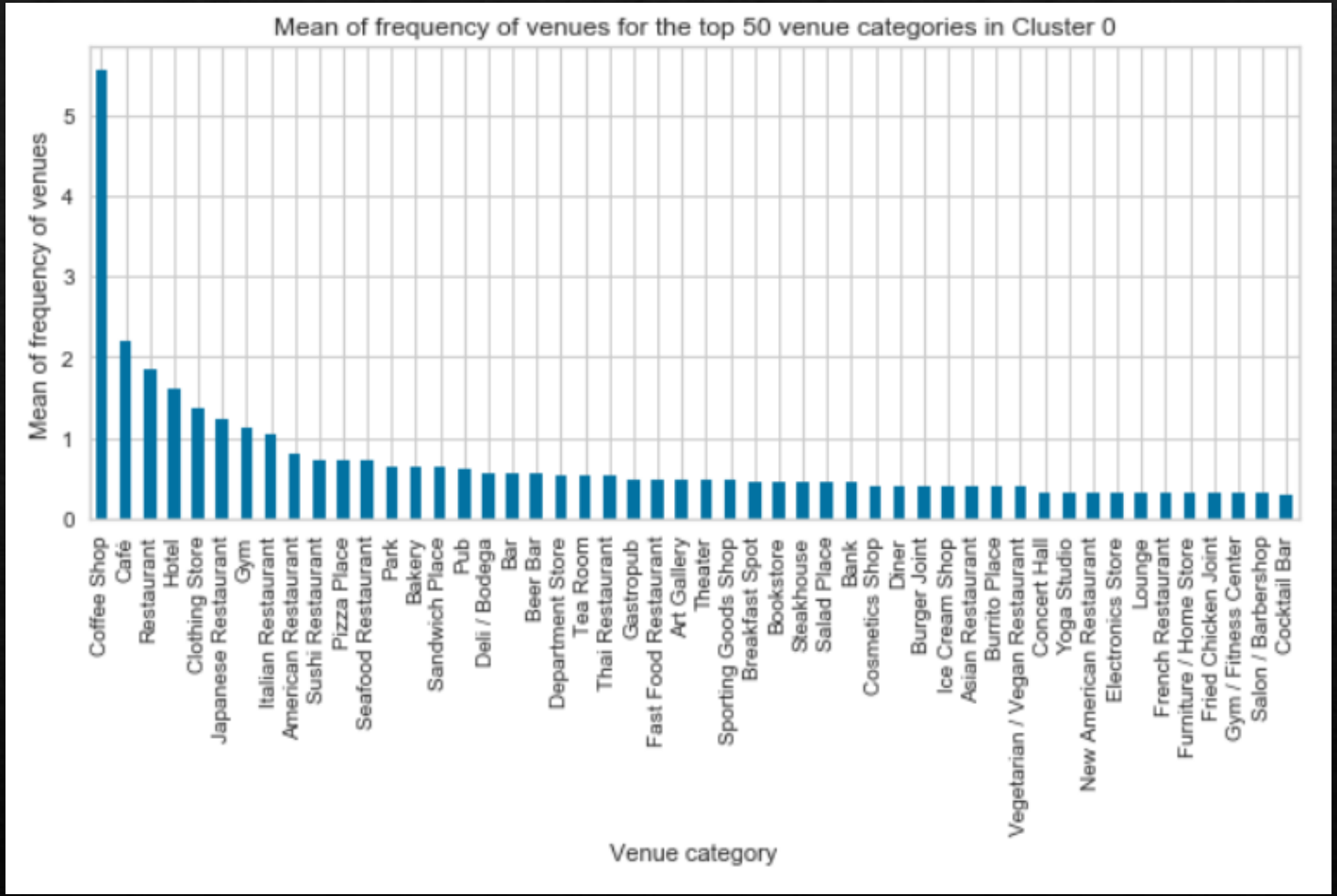
Cluster 3 – Green

Cluster 4 - Purple



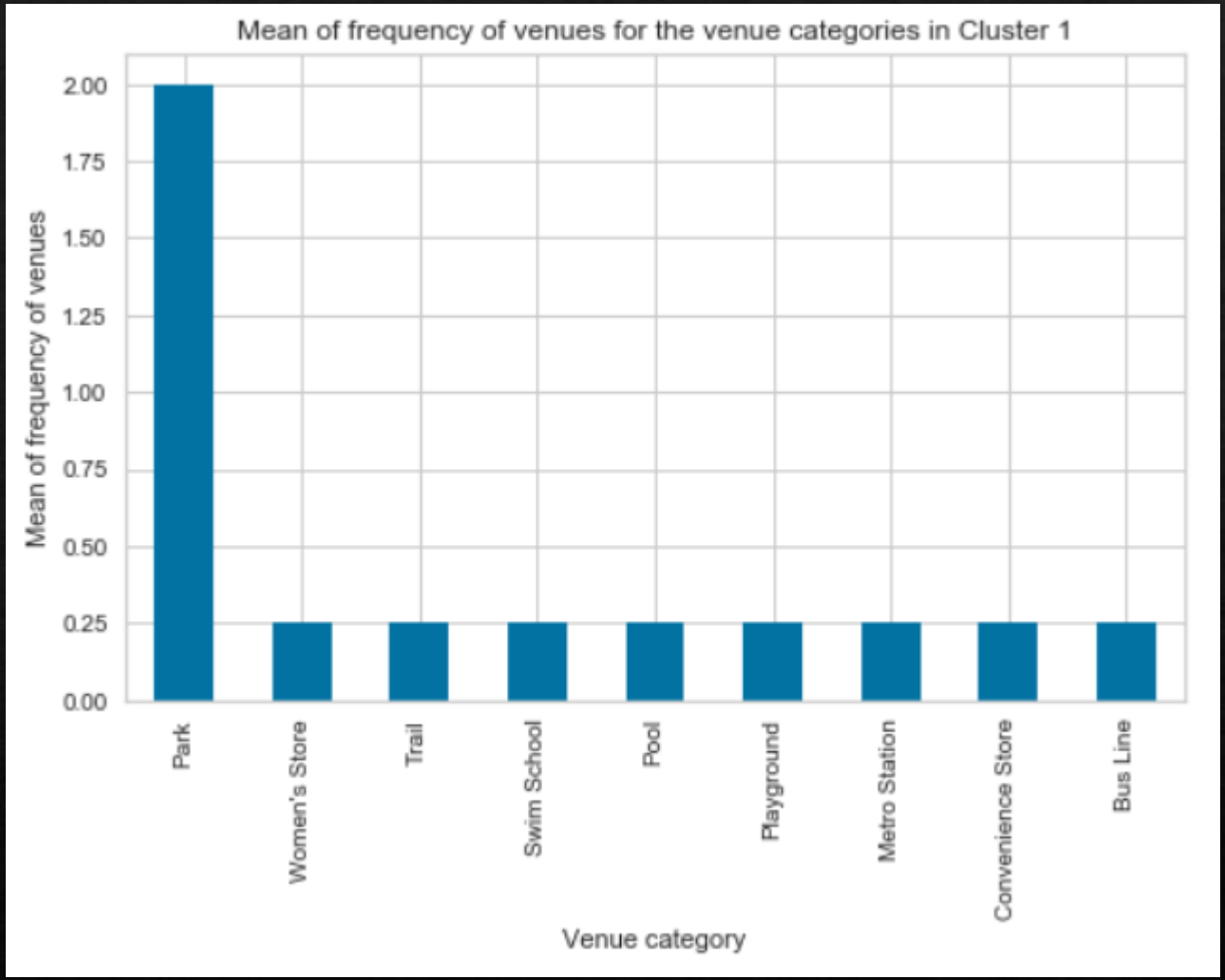
Cluster 0

- There are 25 neighborhoods in this cluster
- Most of the Downtown Toronto neighborhoods fall in this cluster
- Good access to coffee shops, cafes and restaurants which serve diverse types of cuisine. There are also hotels and retail stores. This cluster may be the shopping and dining area of Toronto
- There could be residential areas in these neighborhoods though their property prices may be on the higher side



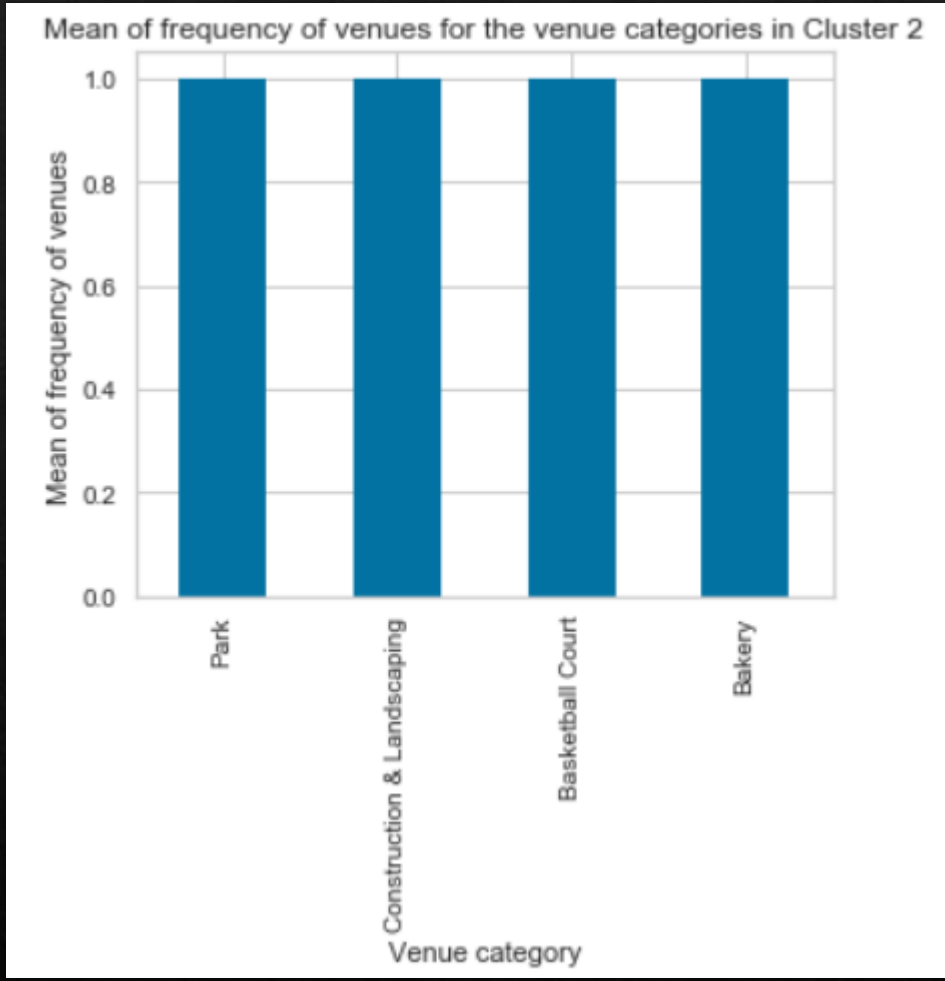
Cluster 1

- There are 4 neighborhoods in this cluster
- The neighborhoods in this cluster seem to be the more relaxed, green and quiet parts of Toronto with more parks, trails, playgrounds, pools available in this cluster compared to other clusters



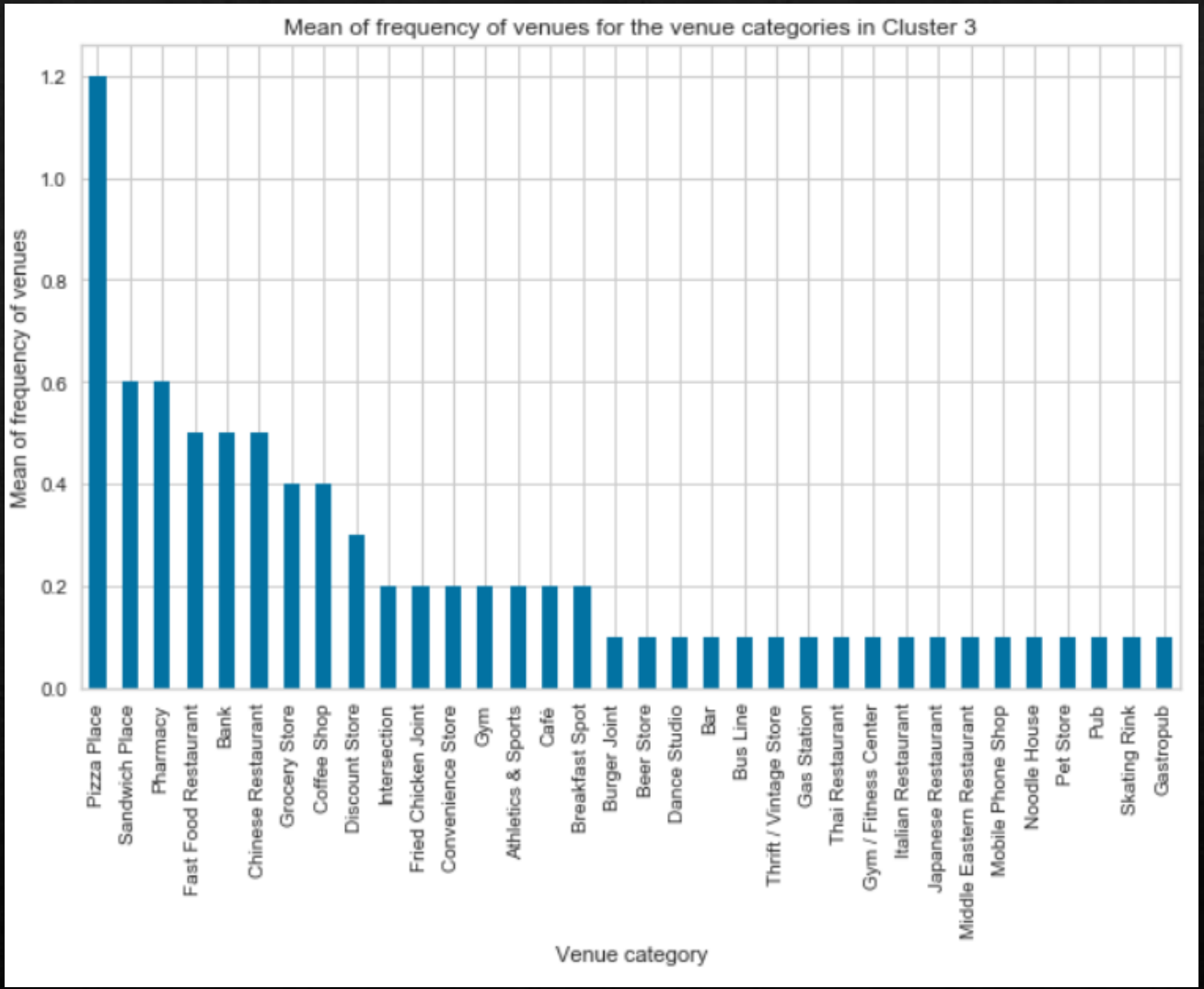
Cluster 2

- There is only 1 neighborhood in this cluster
- This neighborhood contains a park, a bakery, a basketball court and a company



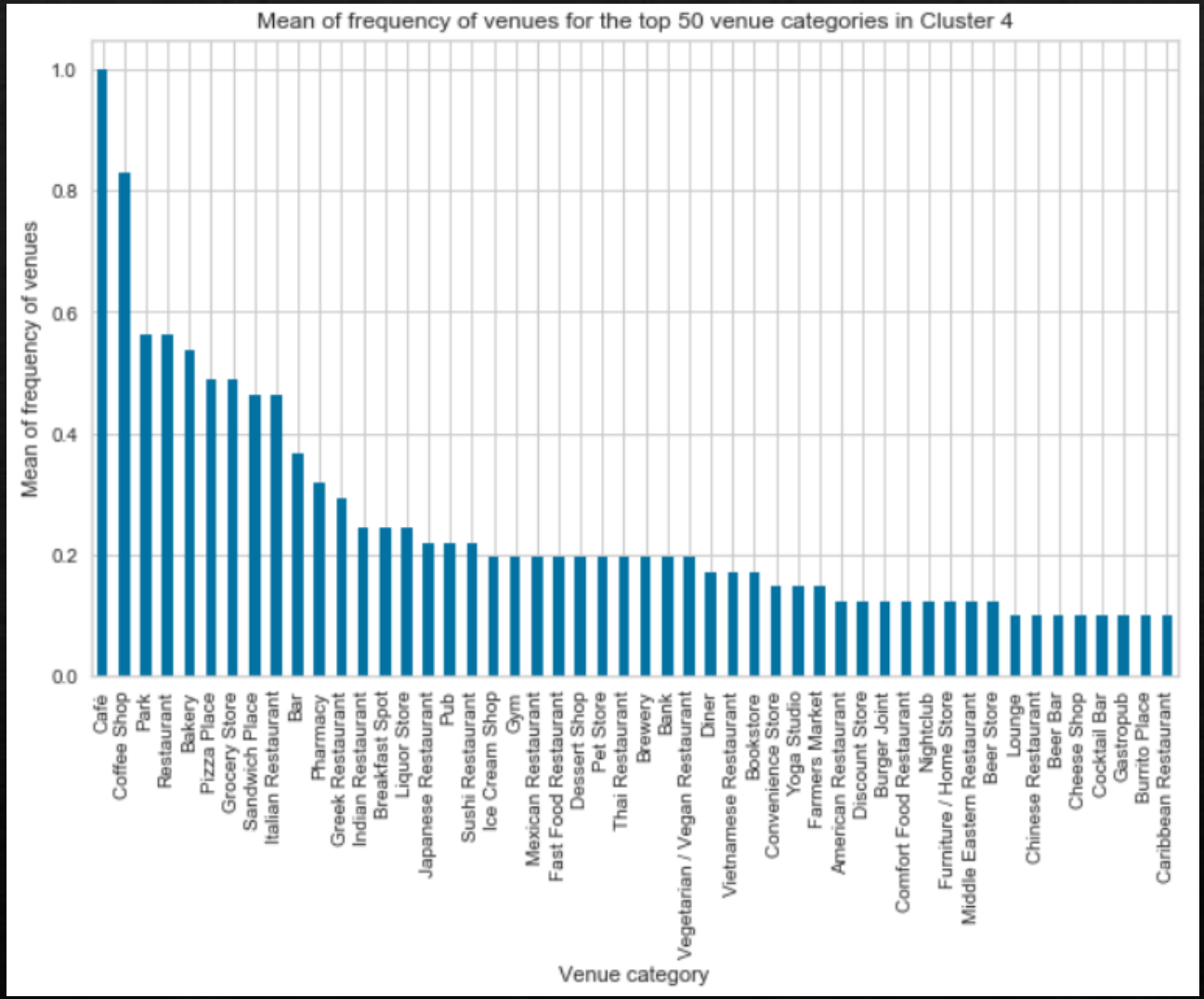
Cluster 3

- There are 10 neighborhoods in this cluster
- Good access to eateries, pharmacies, banks and grocery stores
- Looks like residential areas in Toronto
- Compared to Cluster 0, the neighborhoods are probably less dense due to the lower means of frequencies of the venue categories and the distances of the neighborhoods from Downtown Toronto



Cluster 4

- There are 41 neighborhoods in this cluster
- The neighborhoods in this clusters have quite a number of cafes, coffee shops, parks and restaurants and other eateries.
- This cluster appears to contain neighborhoods where people meet and eat and could potentially be a vibrant residential cluster due to access to a variety of eateries

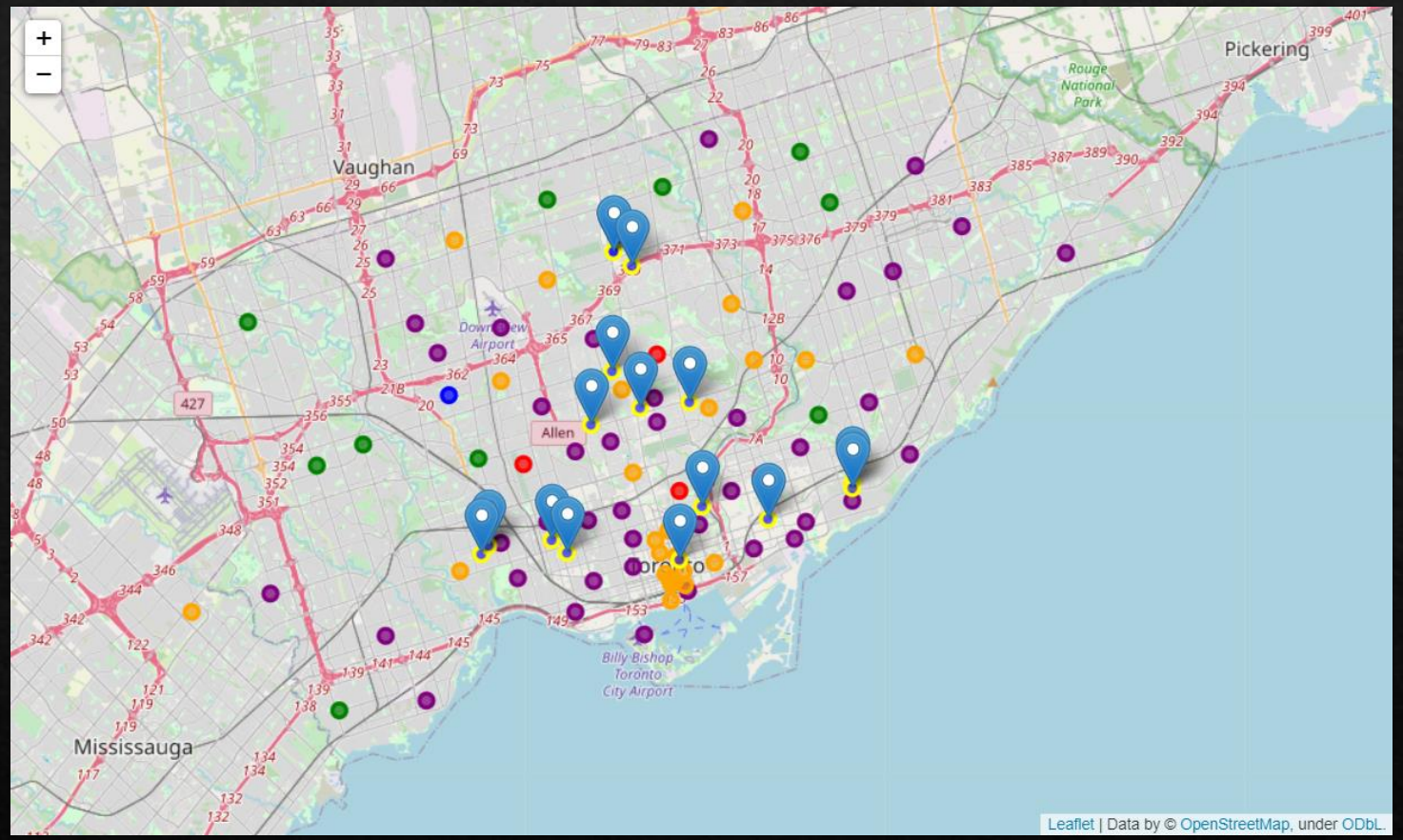


Discussion

- Access to schools with track records and reputation is important
- Compiled a list of top public schools in Toronto from https://justo.ca/blog/the-best-public-schools-in-the-city-of-toronto/
- Superimposed the locations on the map

Locations of top public schools in Toronto

The top public schools seem to be mostly near neighborhoods in cluster 0 and 4



Conclusion

- Based on the results and observations gathered so far, it seems that neighborhoods in Clusters 0 and 4 are potentially suitable neighborhoods to stay for families with children
- However, take note that:
  - The venues in the neighborhoods are based on Foursquare API, which means that if a venue exists only if a Foursquare account user recommends it. There are other venues which exist but not recommended in Foursquare. Hence, the information on the venues may not be conclusive
  - Only the top public schools are explored. Families may prefer private school or other public schools for their children
  - Some families may prefer neighborhoods that are quiet and closer to parks, trails and playgrounds. Hence, they may prefer neighborhoods in Cluster 1 to Clusters 0 and 4

Future works

- Besides access to eateries, stores and schools, safety is also an important factor in deciding where to stay. Find data on crime rates in Toronto
- It would be useful to find out the property prices in each neighborhood. Find data on property prices in Toronto
- Population density of the neighborhood would give the readers of the report a better idea of the neighborhoods

The End

Thank you for your time!