

Comparative neighborhood venue analysis between Downtown Toronto and Manhattan

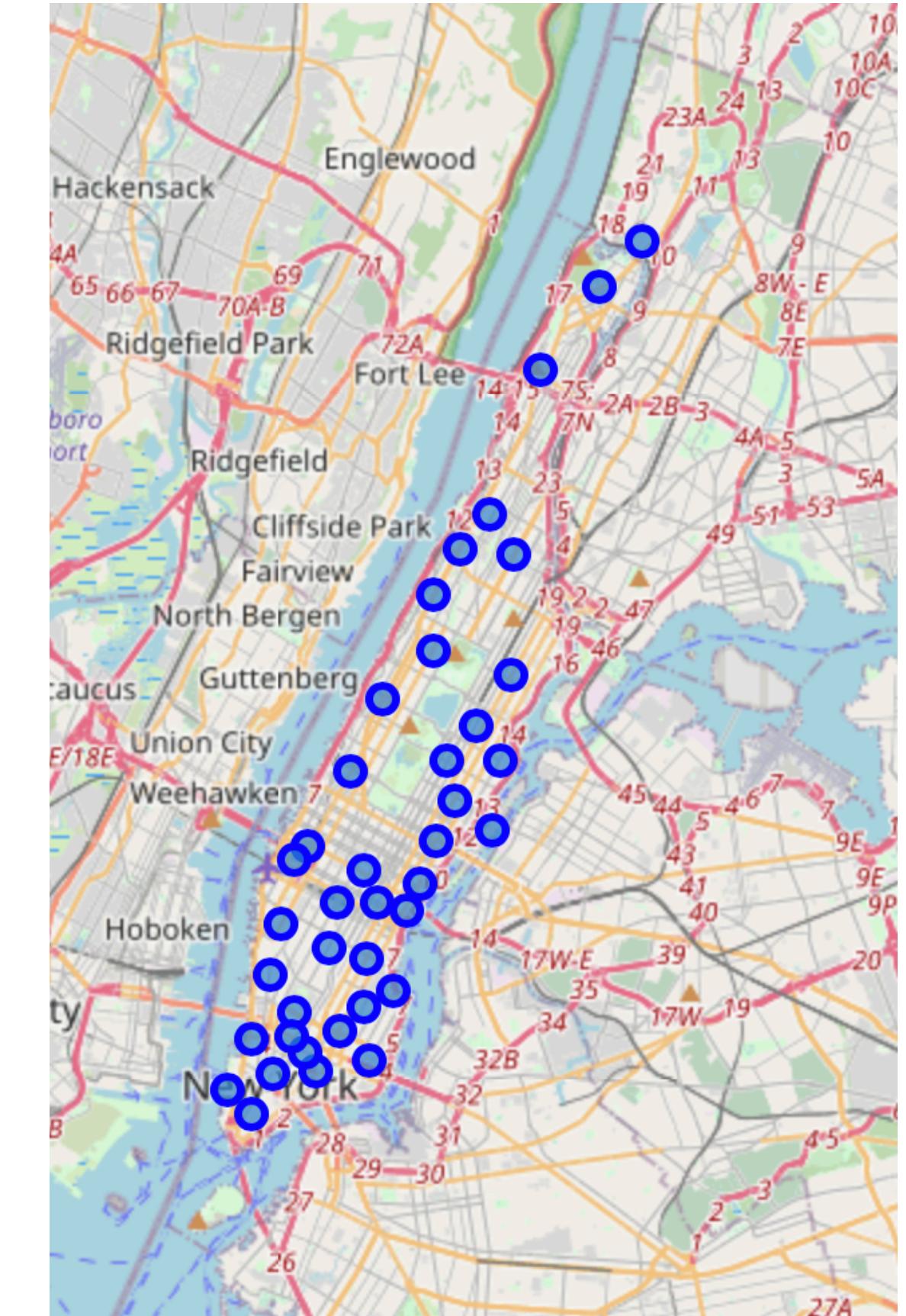
Data-driven recommendations for
Downtown Toronto urban development

Introduction

- The number and choice of venues is an often quoted argument, when people are asked about the quality of life in their city
 - For attracting people/talent and businesses, cities need to be attractive and provide a competitive set of venues
 - In this project we compare the venues in Downtown Toronto with those in Manhattan on a per neighborhood basis



Neighborhoods of Downtown Toronto



Neighborhoods of Manhattan

Business objectives

Provide the urban development team of Downtown Toronto with data based recommendations for the development of a competitive venue landscape in Downtown Toronto

Understand structural differences in venue distribution between Downtown Toronto and the benchmark Manhattan

Analyze identified differences on a per neighborhood basis and discuss the overall statistical comparison

Identify tangible areas for impactful change

Data sources

Geospatial

Venue distribution

Mapping

Toronto

List of neighborhoods from Wikipedia: <https://en.wikipedia.org/wiki/>

List of postal codes of Canada: M
Coordinates from: http://cocl.us/Geospatial_data

New York

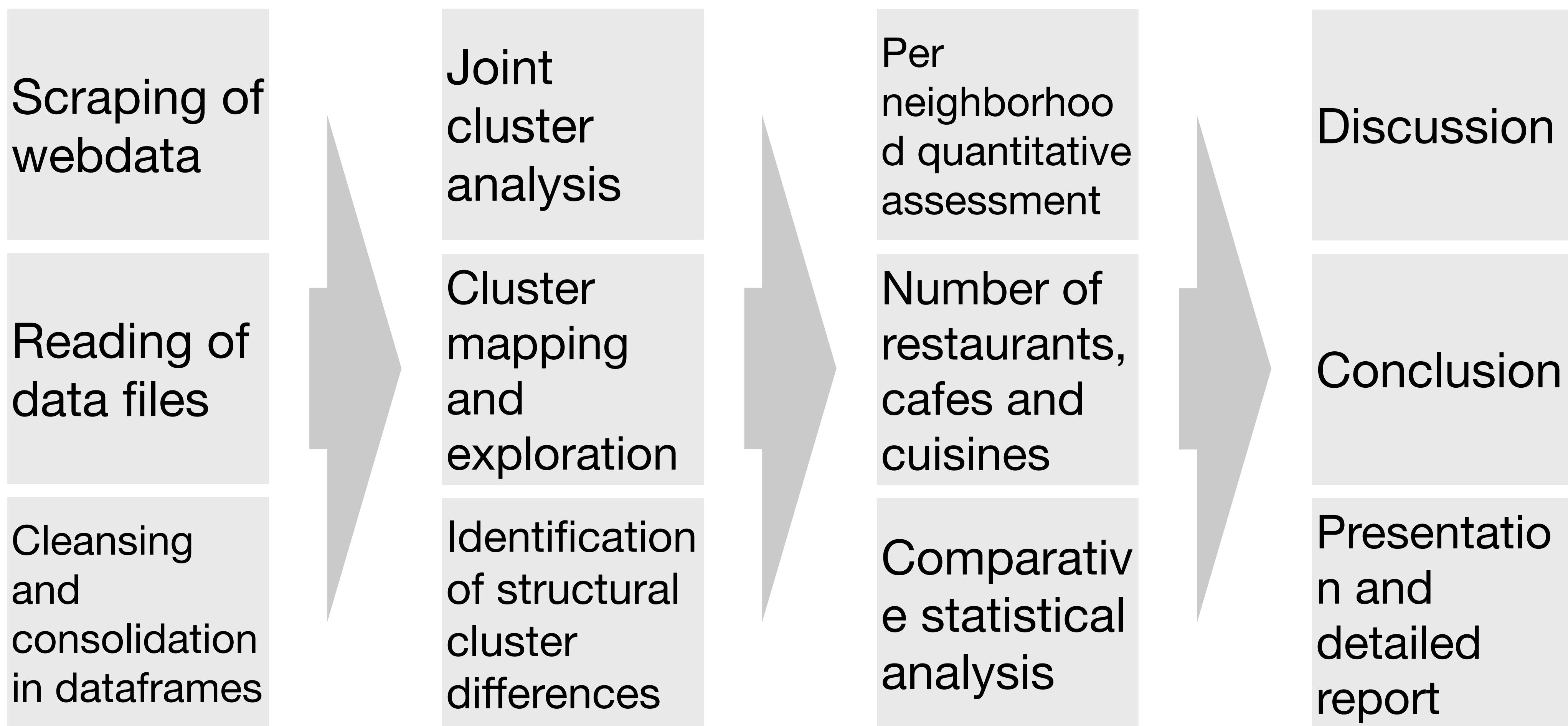
list of neighborhoods, including coordinates provided by Coursera and IBM: https://cf-courses-data.s3.us.cloud-object-storage.appdomain.cloud/IBMDriverSkillsNetwork-DS0701EN-SkillsNetwork/labs/newyork_data.json

Venue data from FourSquare: https://api.foursquare.com/v2/venues/explore?&client_id={}&client_secret={}&v={}&ll={},{},{}&radius={}&limit={}' (client_id and client_secret are confidential)

search radius: 500m default limit: 100 venues per neighborhood

Maps and display of neighborhood and venue locations using Folium library

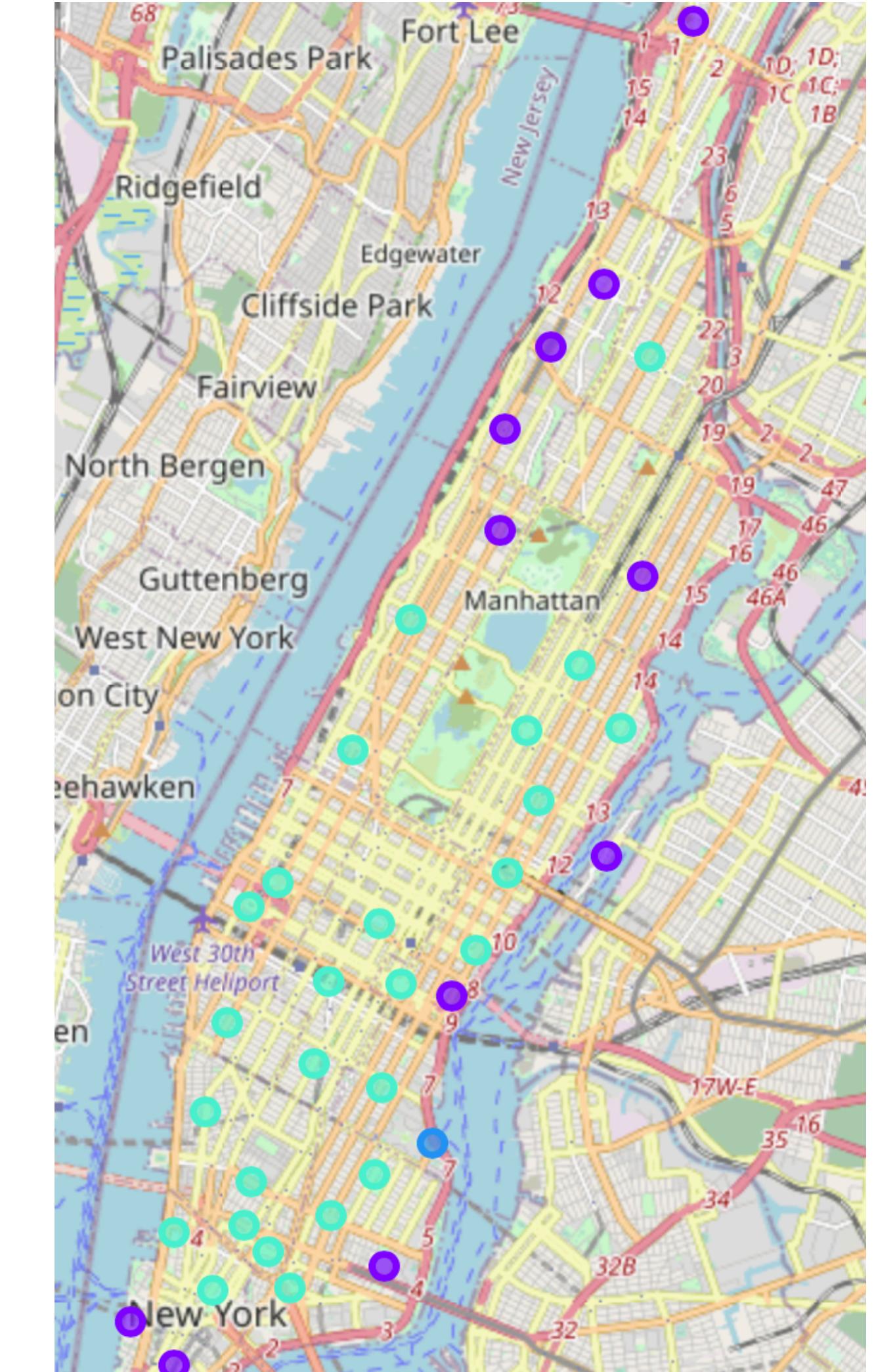
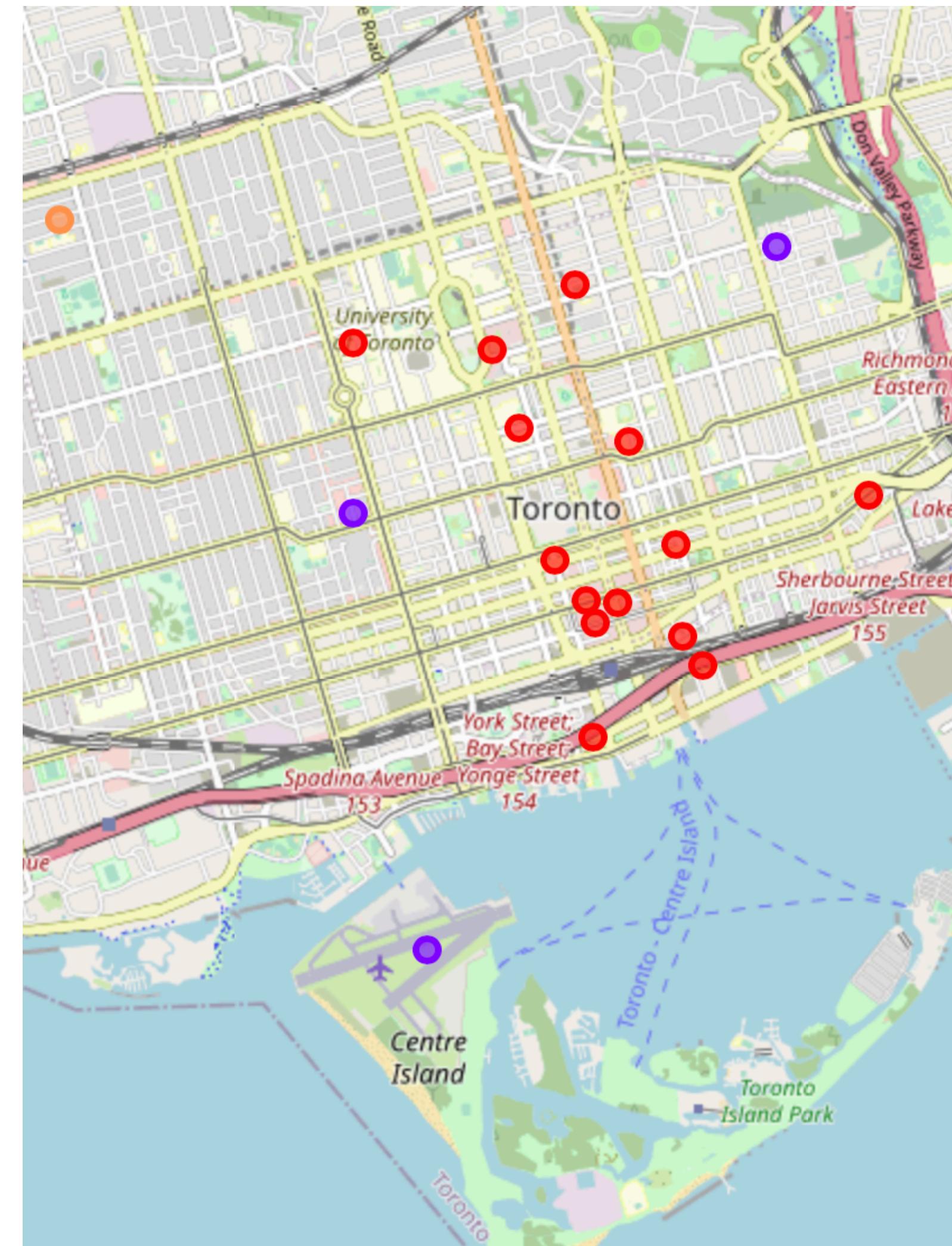
Data exploration and analysis



Neighborhood cluster analysis

Significant cluster differences between the central areas of Downtown Toronto (cluster 1, red) and central areas of Manhattan (cluster 4, turkoise)

- k-means clustering ($k = 6$)
- common dataframe for neighborhoods of both cities



Analysis of central neighborhood clusters

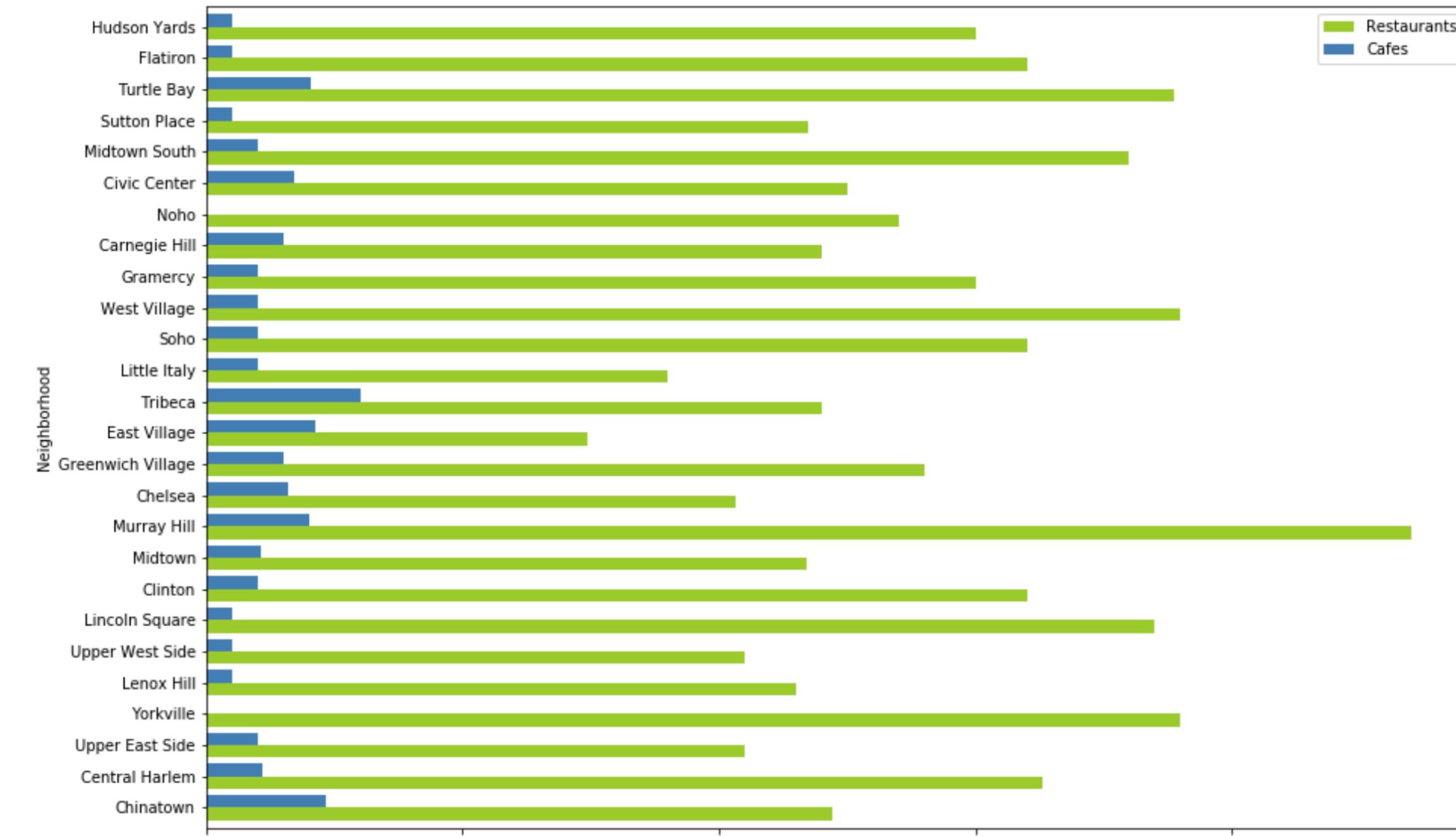
Number of restaurants and cafes

Higher cafe venue share in Downtown Toronto

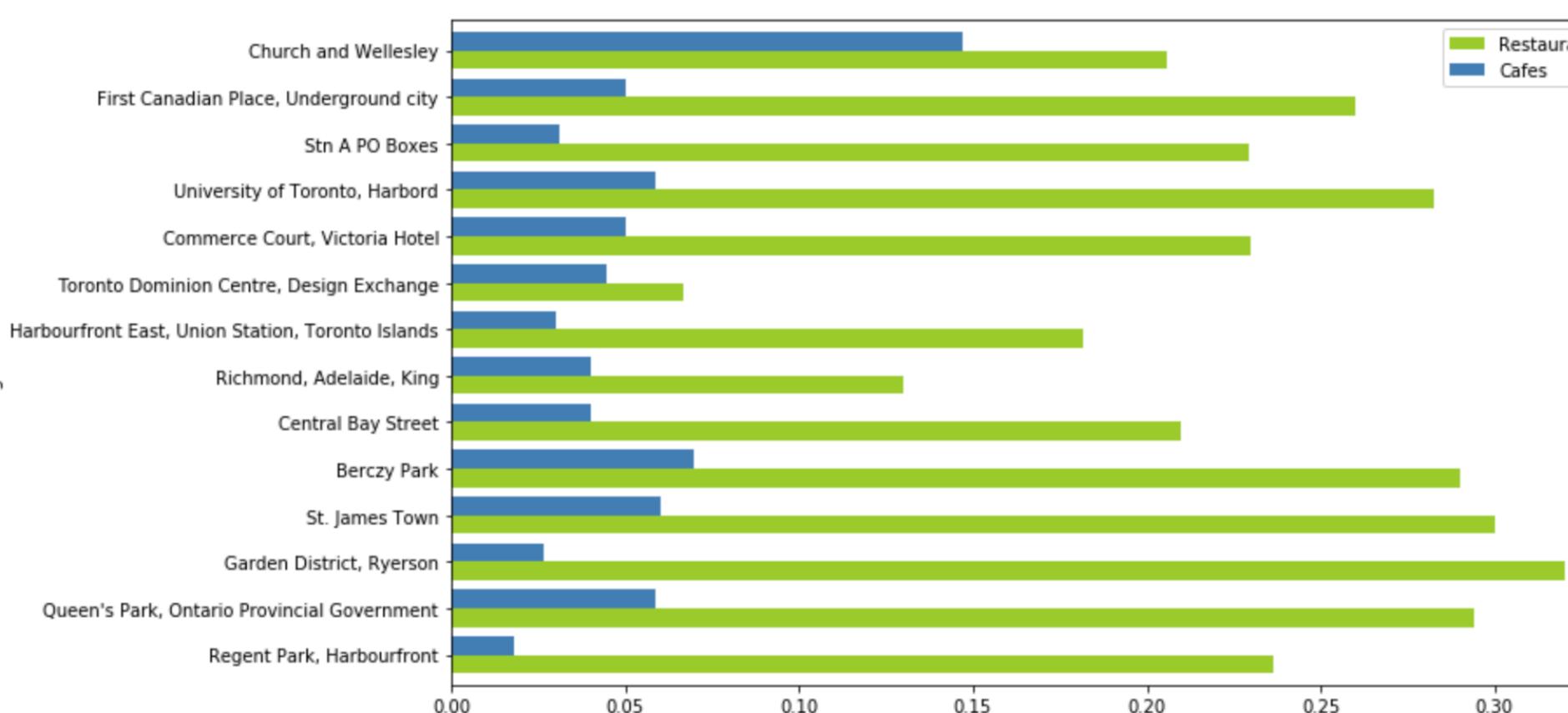
Restaurant venue share of best Downtown Toronto neighborhoods on level of typical Manhattan neighborhoods

Clear gap to best Manhattan neighborhoods

Manhattan
cluster 4 neighborhoods



Downtown Toronto
cluster 1 neighborhoods



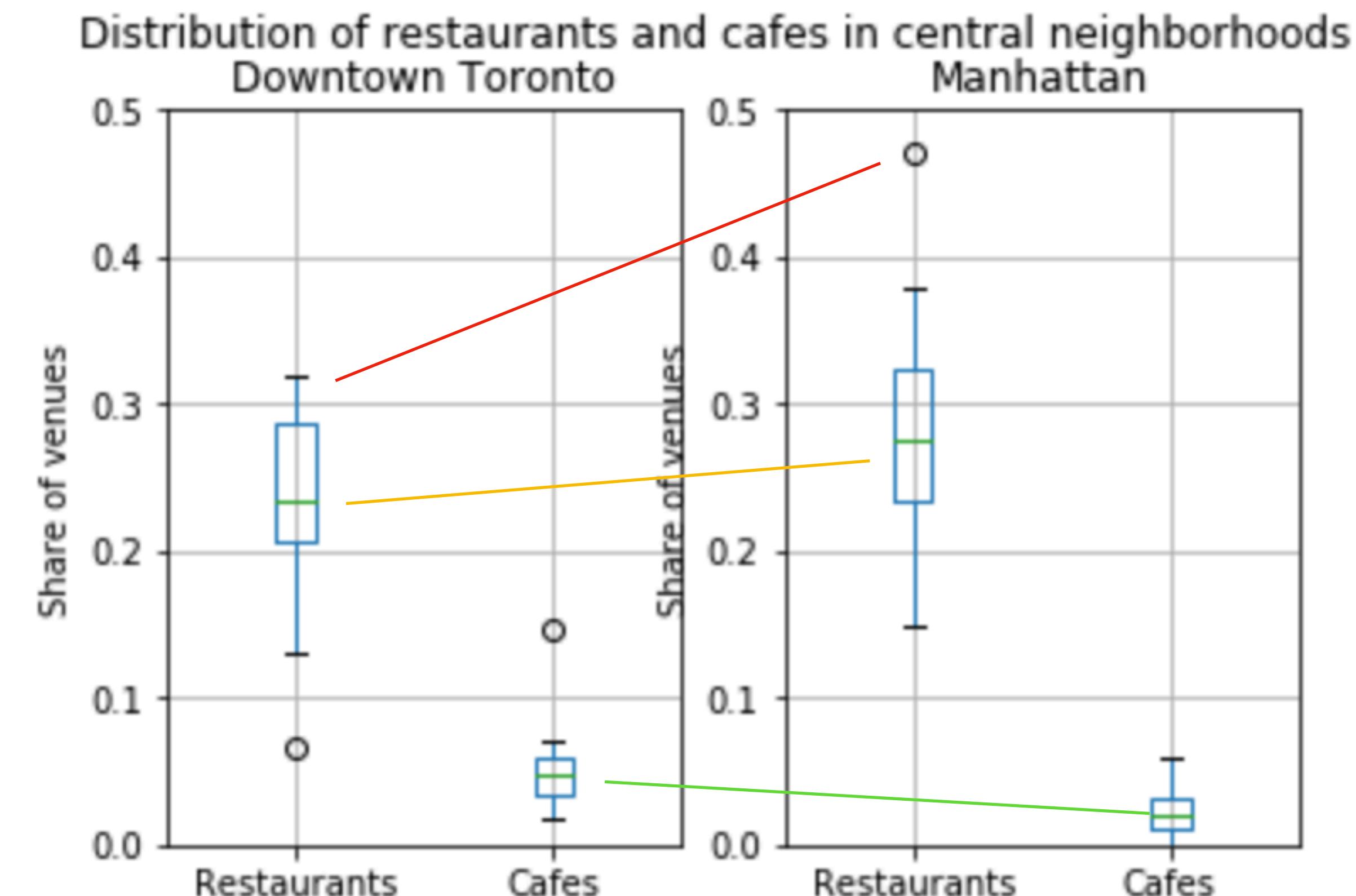
Statistical summary of central neighborhood clusters

Number of restaurants and cafes

Mean cafe share of venues at 5% compared to 2% in Manhattan

Mean restaurant share of venues at 23% compared to 28% in Manhattan

Highest restaurant venue share of a Downtown Toronto neighborhood at only 32% clearly behind 47% in best Manhattan neighborhood



Analysis of central neighborhood clusters

Number of cuisines

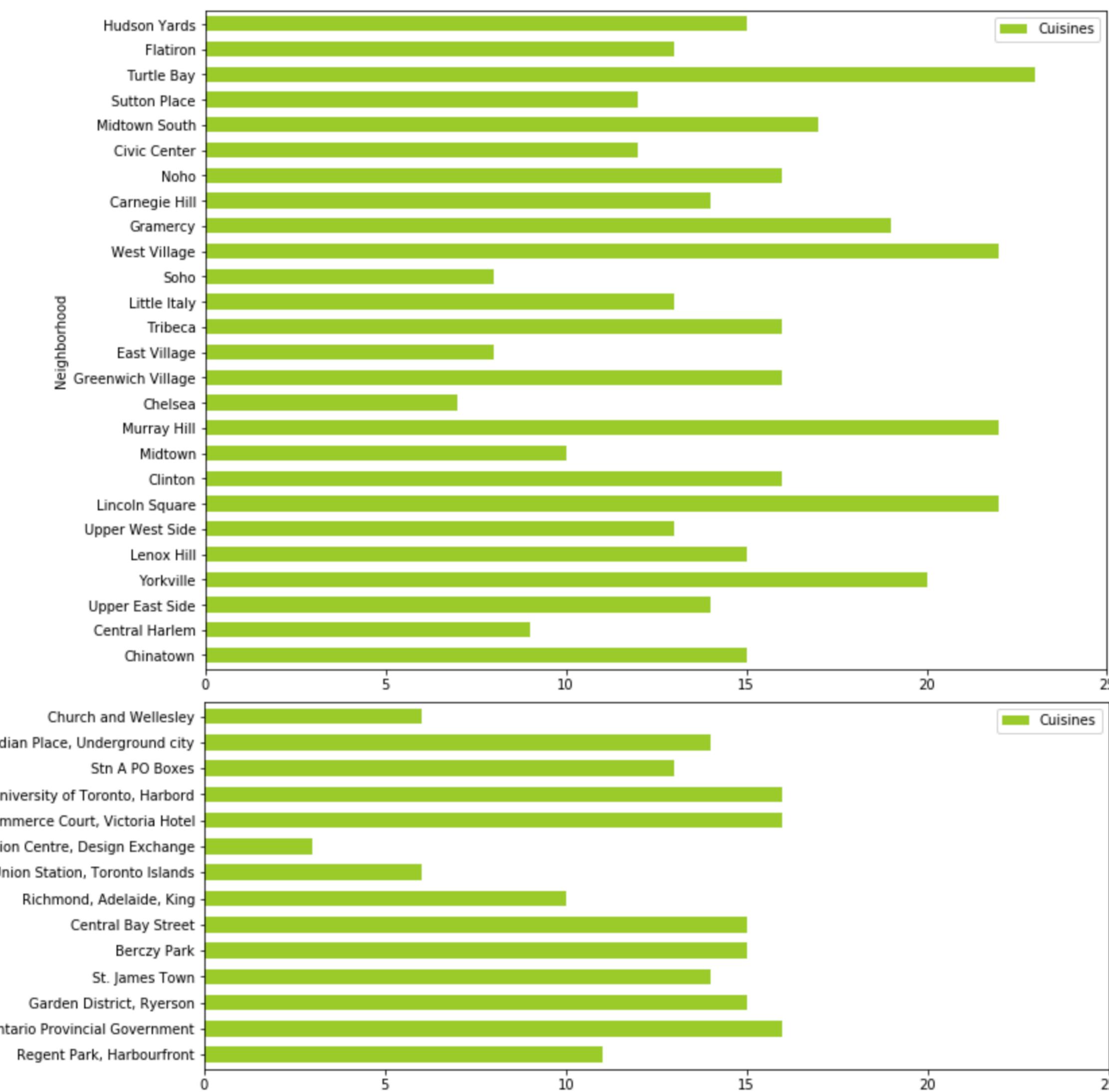
Little choice of cuisine in some Downtown Toronto neighborhoods

Variety of internal cuisines in best Downtown Toronto neighborhoods on level of typical Manhattan neighborhoods

Clear gap to best Manhattan neighborhoods

Manhattan
cluster 4 neighborhoods

Downtown Toronto
cluster 1 neighborhoods



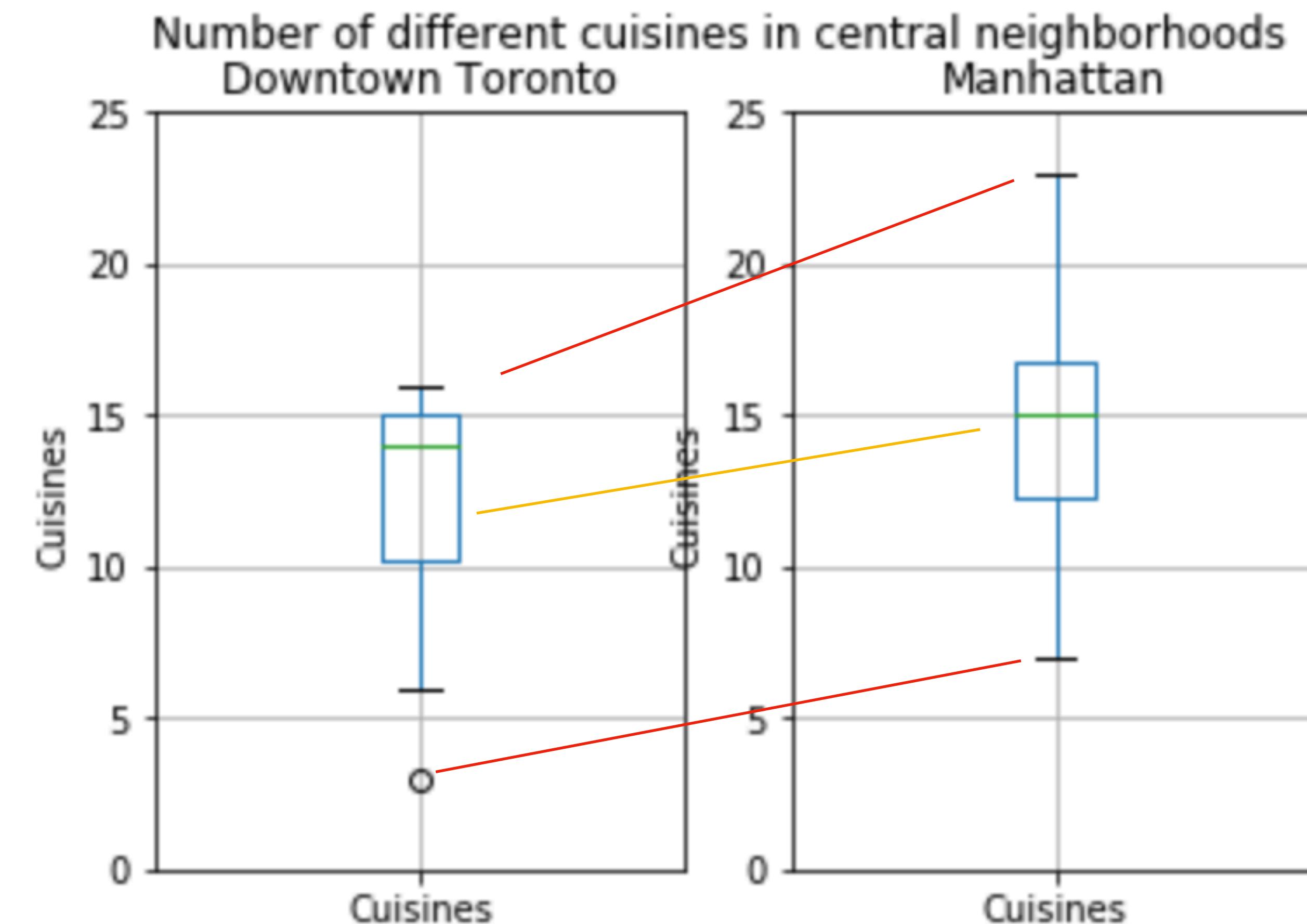
Statistical summary of central neighborhood clusters

Number of cuisines

Only 3 cuisines in one
Downtown Toronto
neighborhood compared to
7 in lowest Manhattan
neighborhood

Mean number of
cuisines at 12
compared to 15 in
Manhattan

Only 16 cuisines in best
Downtown Toronto
neighborhood compared to
23 in best Manhattan
neighborhood



Discussion

A clear gap in number (venue share) and choice (number of cuisines) between best Downtown Toronto and best Manhattan neighborhoods

No significant difference in typical neighborhoods

Limited choice of cuisines in some Downtown Toronto neighborhoods

Conclusion

Build on a good existing venue distribution, which is already close to that of Manhattan.

Develop existing top restaurant neighborhoods further to close the gap to the best Manhattan neighborhoods.

Encourage establishment of restaurants with additional international cuisines in these areas

Encourage establishment of additional restaurants in neighborhoods with smallest restaurant venue share