BATTLE OF THE NEIGHBOURHOODS

Applied Data Science Capstone

Introduction

Toronto, Ontario

- Toronto is the largest city in Canada, and is considered to be one of the most multicultural cities in the world [1]
- In 2019 it was in the top 10 ‘Most Livable Cities’ as reported by The Economist [2]
- High cost of living – in 2018, the average price among all home types in Toronto was $835,422 [3]

BUSINESS PROBLEM

3-bedroom rental unit target market

- More and more families are moving out of the city when they have children
  - due to the rising cost of home ownership
  - shortage of family-sized rental options
- Toronto has a wealth of schools, libraries, and childcare that are optimal for child-rearing
- The developer aims to empower young families to move back into the city

PROJECT AIM

Compile a shortlist of neighbourhoods that feature criteria that will attract the target market to a rental property.

- Target market: young families who can't afford to purchase a house in the city, but need more space than a traditional 1 or 2 bedroom apartment

DATA

Source

Foursquare API
City of Toronto Open Data Catalogue

Cleaning

Neighbourhood locations
Family-oriented venue features

Analysis

K-means clustering
Data exploration

Visualization

Folium maps

DATA SOURCES

- Location data: City of Toronto Open Data Catalogue
- Venue data: Foursquare API

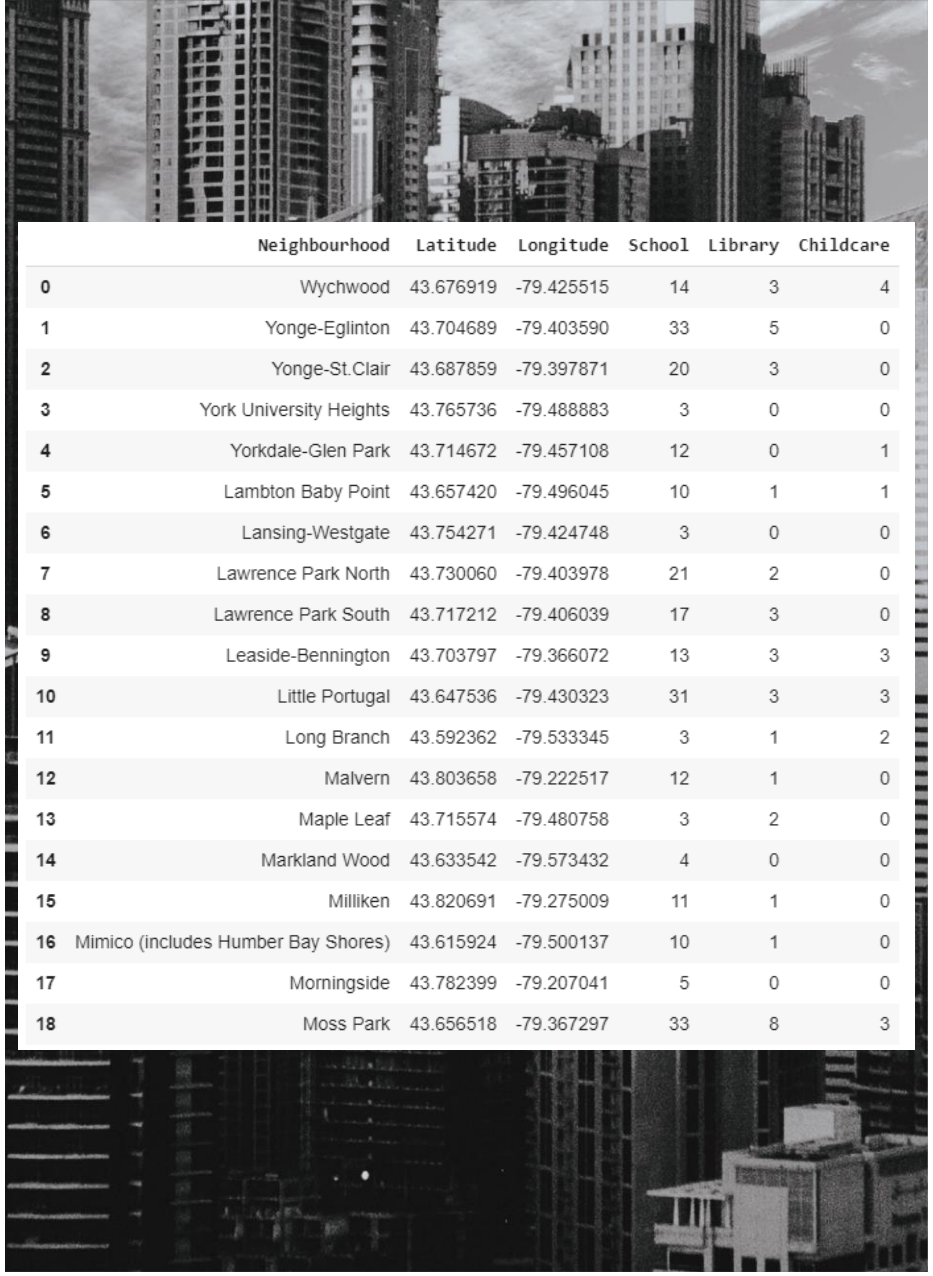
DATA CLEANING

- Location data: City of Toronto Open Data Catalogue
  - **Clean up neighbourhood name data**
  - **Save only the coordinates for the centre of neighbourhood**

- Venue data: Foursquare API
  - **Limited to 100 venues within 1km**
  - **Limited to schools, libraries, and childcare centres**

DATA ANALYSIS

- A dataframe is created summarizing the number of each venue of interest per neighbourhood
- The data is normalized using sklearn preprocessing
- K-means clustering is run
- The ‘elbow method’ is used to determine appropriate k value
- Three distinct clusters are resulting



	Neighbourhood	Latitude	Longitude	School	Library	Childcare
0	Wychwood	43.676919	-79.425515	14	3	4
1	Yonge-Eglinton	43.704689	-79.403590	33	5	0
2	Yonge-St.Clair	43.687859	-79.397871	20	3	0
3	York University Heights	43.765736	-79.488883	3	0	0
4	Yorkdale-Glen Park	43.714672	-79.457108	12	0	1
5	Lambton Baby Point	43.657420	-79.496045	10	1	1
6	Lansing-Westgate	43.754271	-79.424748	3	0	0
7	Lawrence Park North	43.730060	-79.403978	21	2	0
8	Lawrence Park South	43.717212	-79.406039	17	3	0
9	Leaside-Bennington	43.703797	-79.366072	13	3	3
10	Little Portugal	43.647536	-79.430323	31	3	3
11	Long Branch	43.592362	-79.533345	3	1	2
12	Malvern	43.803658	-79.222517	12	1	0
13	Maple Leaf	43.715574	-79.480758	3	2	0
14	Markland Wood	43.633542	-79.573432	4	0	0
15	Milliken	43.820691	-79.275009	11	1	0
16	Mimico (includes Humber Bay Shores)	43.615924	-79.500137	10	1	0
17	Morningside	43.782399	-79.207041	5	0	0
18	Moss Park	43.656518	-79.367297	33	8	3

DATA ANALYSIS

- The neighbourhoods in the ‘most ideal’ cluster have their venue scores summed
- A ‘Top 5’ list is created based on feature score

	Neighbourhood	Total_Score
0	Bay Street Corridor	2.170068
1	University	2.133333
2	Church-Yonge Corridor	2.090476
3	Kensington-Chinatown	2.059184
4	North St.James Town	1.773469

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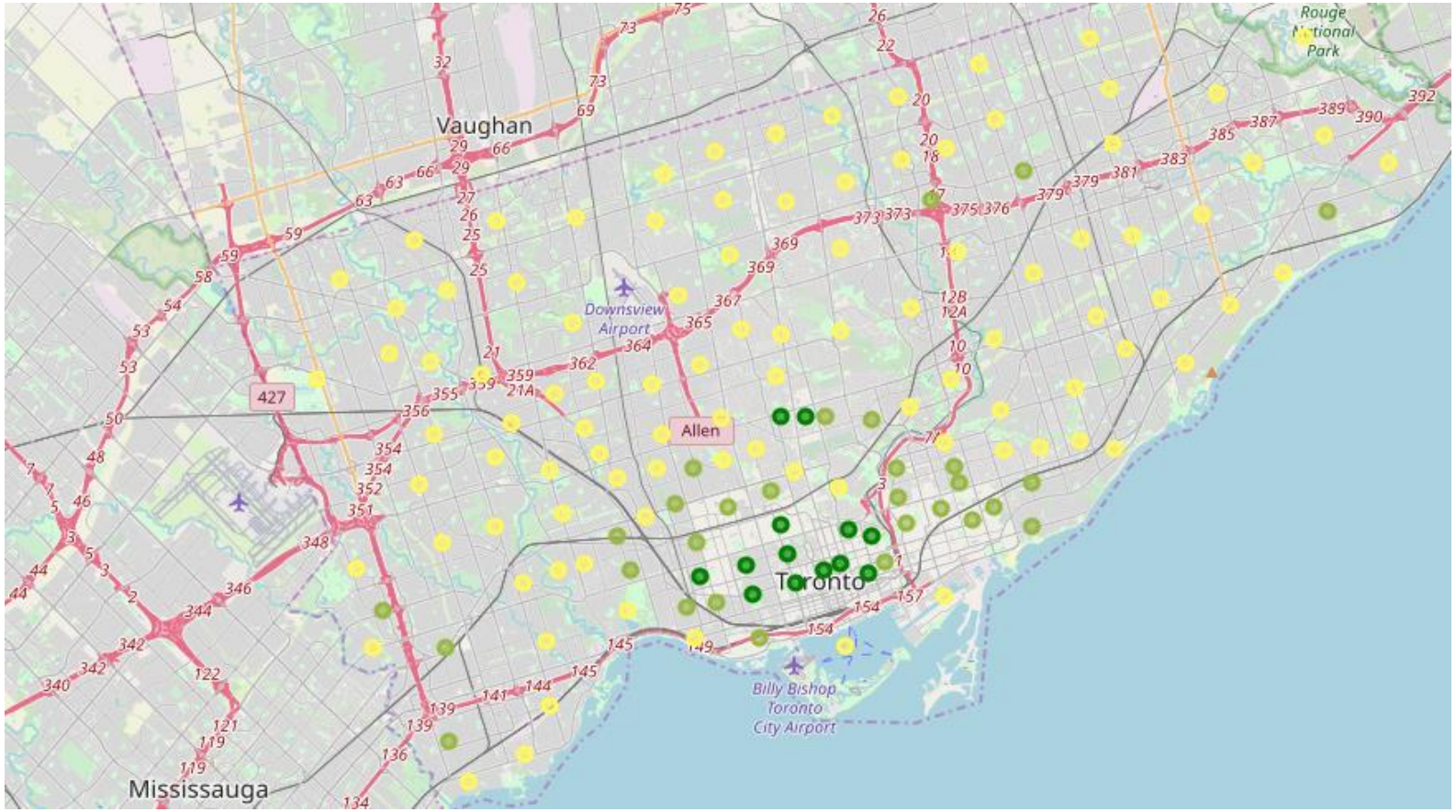
DATA VISUALIZATION

K-means clustered neighbourhood map



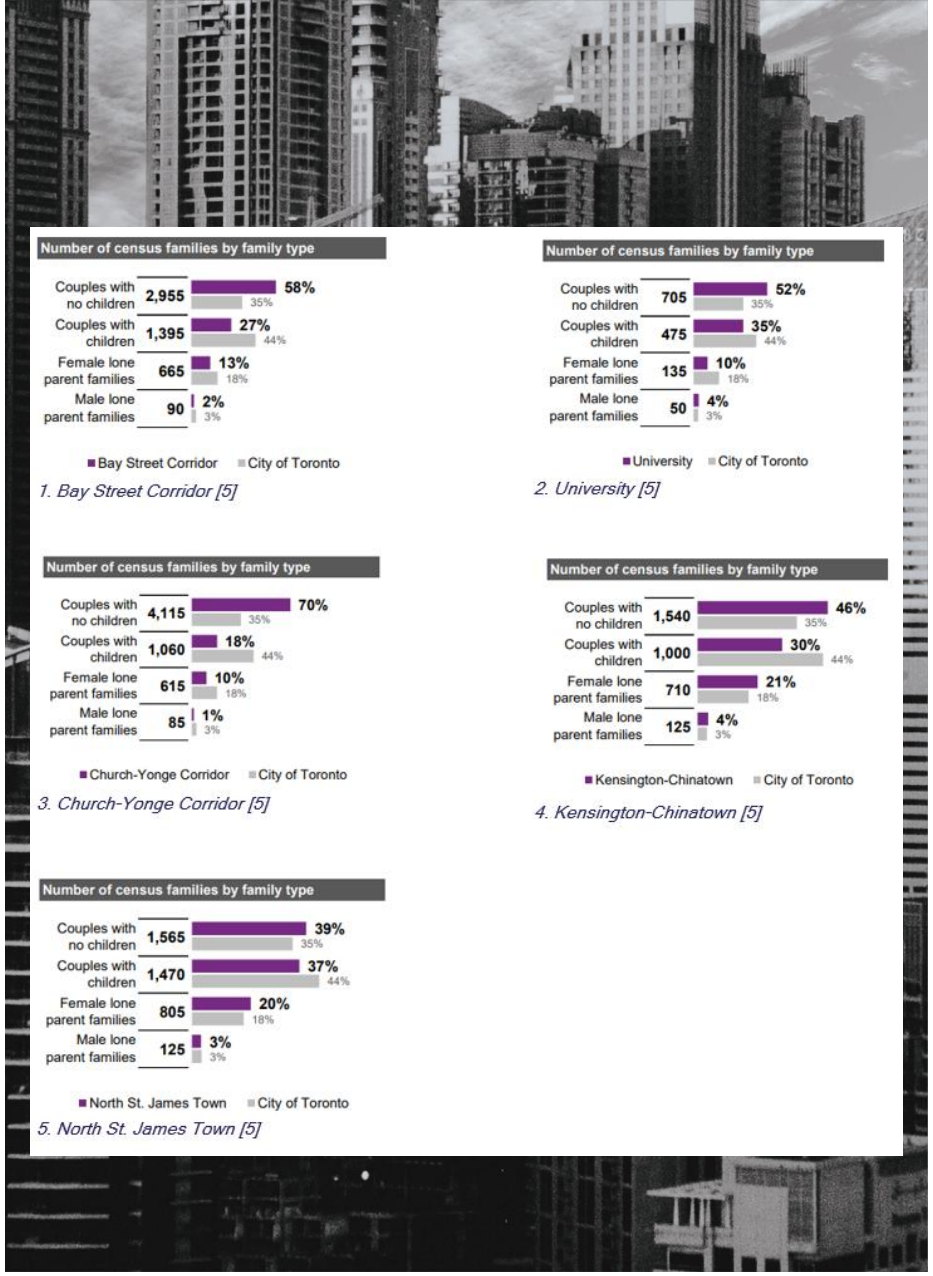
Green = Most ideal
Light green = Moderately ideal
Yellow = Less ideal

DATA VISUALIZATION

‘Top 5’ neighbourhoods as recommended to the developer

DISCUSSION

- Surprisingly, these top 5 neighbourhoods are all in the downtown core
- The demographics of these neighbourhoods indicate that most residents are currently childless – presenting a good opportunity for market growth



CONCLUSION

- This study analyzed the 140 neighbourhoods of the City of Toronto to determine which would be the most appealing for a developer to build young family-oriented rental housing
- These venue variables could easily be changed or added to if the developer chooses to focus in on a more specific cross-section of the demographic
- Significantly deeper analysis could be run to include more nuanced data including income levels, land cost, current rental vacancy rate, and a plethora of more complicated factors

REFERENCES

[1] https://www.toronto.ca/community-people/moving-to-toronto/about-toronto/

[2] https://www.eiu.com/public/topical_report.aspx?campaignid=liveability2019

[3] https://www.toronto.ca/city-government/data-research-maps/toronto-at-a-glance/

[4] https://www.toronto.ca/city-government/data-research-maps/neighbourhoods-communities/neighbourhood-profiles/

[5] https://www.toronto.ca/city-government/data-research-maps/neighbourhoods-communities/neighbourhood-profiles/