Introduction/Business Problem

I have been living on the west side of the City of Toronto in Canada for the past few years. I love the neighborhood, mainly because of all the great amenities and other types of venues that exist in the neighborhood, such as local food stores, pharmacies, parks, grad schools and so on. However, my work locations have always been in downtown Toronto. So, I'm thinking of moving to downtown or somewhere closer to downtown area. In order to make the decision, I want to understand if downtown a similar or better neighborhood has compared to the west side of Toronto.

Areas that I'm interested needs to meet the following criteria:
- A neighborhood with an average to above average total population
- Above average populations of 25–40-year-old male and female professionals
- A high concentration of the population having secondary education
- Average to above average median net household incomes

Describe the Data

The necessary information needed to make the moving decision will come from the following sources:

1). City of Toronto Neighborhood Profiles for providing an overview of the neighborhoods in Toronto.

City of Toronto Open Data Catalogue : for population data based on the Census of Population that was held across Canada in 2016. Information includes population, age and sex, type of dwelling, families, households and marital status, language, income, immigration and ethnocultural diversity, housing, Aboriginal peoples, education, labour, journey to work, language of work and mobility and migration, as measured in the census program. CSV File

City of Toronto Neighborhood Shapes for mapping : GeoJSON File based on CKAN API

2). Wikipedia for Toronto Neighborhood Borough Designation : Each of the 140 social planning neighborhoods of Toronto reside within a defined borough. While the City of Toronto is a singular municipality, the 140 neighborhoods are still grouped into six distinct boroughs.

3).Foursquare API to collect information on other venues/competitors in the neighborhoods of Toronto

Analysis

In order to establish the targeted neighborhood(s) – Downtown Toronto and Etobicoke, we will first explore the demographics of the neighborhoods in the city of Toronto by segmenting the data and conducting descriptive analysis using Panda. Additional data will be gleaned by web scraping and API will be used to generate data. In the end, we will focus our analysis on the two neighborhoods specifically.

2016 Census Data:

1. Data was pulled into from the City of Toronto Neighborhoods Profile Census CSV File to create a dataframe.
2. This dataframe contains all the census data (2016) of the neighborhoods of Toronto that will be filtered.
3. Data is filtered into columns based on neighborhood population, male and female age groups, education level, and after-tax income.

Characteristic	Neighbourhood Number	Population, 2016	Population density per square kilometre	Average household size	University certificate, diploma or degree at bachelor level or above	After-tax income: Average amount ($)	Male	Female
Agincourt North	129	29,113	3,929	3.16	4240	26,955	2530	2715
Agincourt South-Malvern West	128	23,757	3,034	2.88	4615	27,928	2490	2525
Alderwood	20	12,054	2,435	2.6	1980	39,159	1220	1230
Annex	95	30,526	10,863	1.8	12640	80,138	4745	4980
Banbury-Don Mills	42	27,695	2,775	2.23	8060	51,874	2115	2500

Wikipedia data - neighborhoods with boroughs:

1. Wikipedia page for Toronto Neighborhood Borough Designations is scraped using BeautifulSoup.
2. Scraped data is transformed to dataframe.

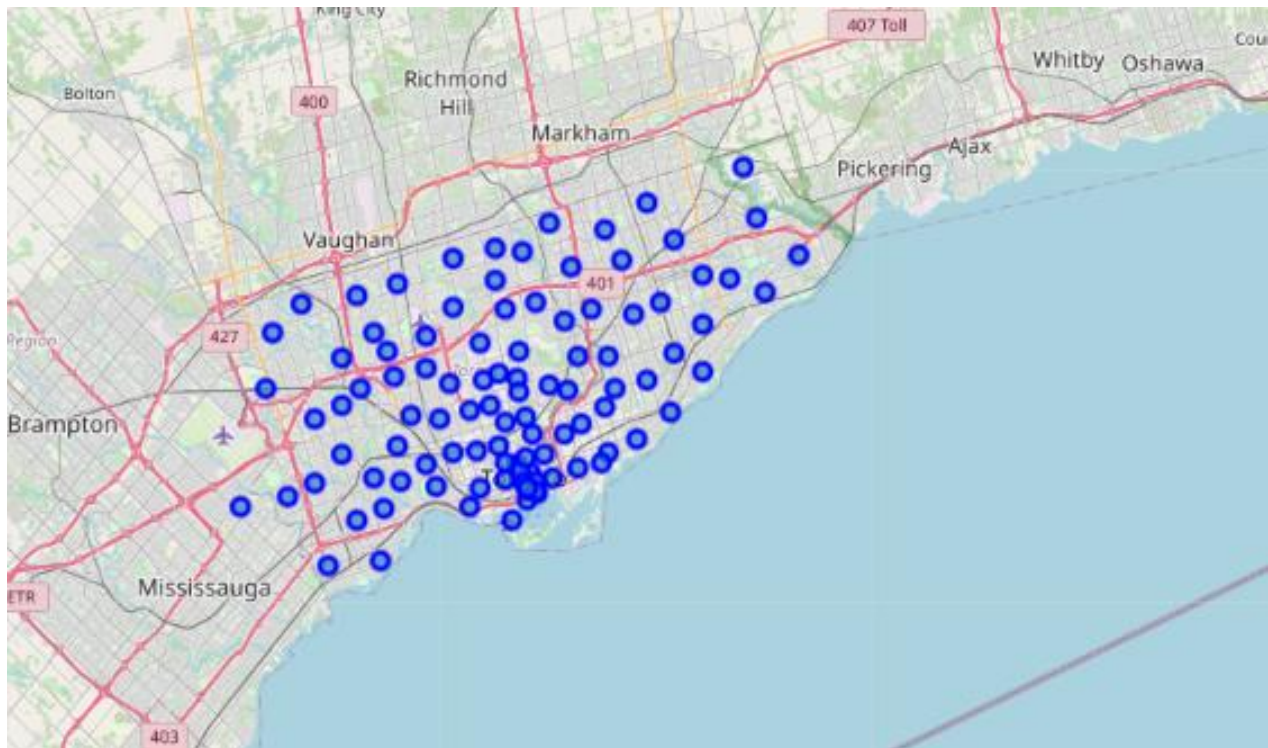|	Postcode	Borough	Neighborhood	Latitude	Longitude
0	M3A	North York	Parkwoods	43.753259	-79.329656
1	M4A	North York	Victoria Village	43.725882	-79.315572
2	M5A	Downtown Toronto	Regent Park, Harbourfront	43.654260	-79.360636
3	M6A	North York	Lawrence Manor, Lawrence Heights	43.718518	-79.464763
4	M7A	Downtown Toronto	Queen's Park, Ontario Provincial Government	43.662301	-79.389494
5	M9A	Etobicoke	Islington Avenue	43.667856	-79.532242
6	M1B	Scarborough	Malvern, Rouge	43.806686	-79.194353

Pull Toronto shape file:

1. Get the shape file.
2. Remove unnecessary data and merge to previous dataframe.

NAME	Neighbourhood Number	Population, 2016	Population density/sk	Average household size	Higher Education	After-tax income	Male	Female	LATITUDE	LONGITUD
urt North	129	29,113	3929	3.16	4240	26955	2530	2715	43.805441	-79.266712
urt South-n West	128	23,757	3034	2.88	4615	27928	2490	2525	43.788658	-79.265612
ood (20)	20	12,054	2435	2.60	1980	39159	1220	1230	43.604937	-79.541611
(95)	95	30,526	10863	1.80	12640	80138	4745	4980	43.671585	-79.404001
y-Don 2)	42	27,695	2775	2.23	8060	51874	2115	2500	43.737657	-79.349718
st Manor	34	15,873	3377	2.56	4030	37927	1530	1670	43.764813	-79.456055

Map of Toronto Neighborhoods:

Using Foursquare API to analyze Neighborhoods in Downtown Toronto and Etobicoke

1) # of venues in each neighborhood:

Neighborhood	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
Alderwood, Long Branch	9	9	9	9	9	9
Berczy Park	55	55	55	55	55	55
CN Tower, King and Spadina, Railway Lands, Harbourfront West, Bathurst Quay, South Niagara, Island airport	17	17	17	17	17	17
Central Bay Street	63	63	63	63	63	63
Christie	17	17	17	17	17	17
Church and Wellesley	74	74	74	74	74	74

2)Most common venues

	Neighborhood	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
0	Alderwood, Long Branch	Pizza Place	Gym	Pool	Skating Rink	Sandwich Place	Pub	Coffee Shop	Pharmacy	Col Res
1	Berczy Park	Coffee Shop	Cocktail Bar	Restaurant	Seafood Restaurant	Beer Bar	Bakery	Café	Cheese Shop	Jap Res
2	CN Tower, King and Spadina, Railway Lands, Har...	Airport Lounge	Airport Service	Airport Terminal	Harbor / Marina	Coffee Shop	Boat or Ferry	Rental Car Location	Bar	Sc Ga
3	Central Bay Street	Coffee Shop	Italian Restaurant	Sandwich Place	Café	Burger Joint	Thai Restaurant	Japanese Restaurant	Salad Place	Ice Sh
4	Christie	Grocery Store	Café	Park	Candy Store	Diner	Italian Restaurant	Baby Store	Athletics & Sports	Re

Results and Discussion section

1) Clustering the Neighborhoods;

	Postcode	Borough	Neighborhood	Latitude	Longitude	Cluster_Labels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue
0	M8W	Etobicoke	Alderwood, Long Branch	43.602414	-79.543484	1	Pizza Place	Gym	Pool	Skating Rink
1	M5E	Downtown Toronto	Berczy Park	43.644771	-79.373306	1	Coffee Shop	Cocktail Bar	Restaurant	Seafood Restaurar
2	M5V	Downtown Toronto	CN Tower, King and Spadina, Railway Lands, Har...	43.628947	-79.394420	1	Airport Lounge	Airport Service	Airport Terminal	Harbor / Marina
3	M5G	Downtown Toronto	Central Bay Street	43.657952	-79.387383	1	Coffee Shop	Italian Restaurant	Sandwich Place	Café

2) Census Data:

	AREA_NAME	Neighbourhood Number	Population, 2016	Population density/sk	Average household size	Higher Education	After-tax income	Male	Female	LATITUDE	LO
47	Niagara (82)	82	31,180	10156	1.62	15755	54803	8860	8920	43.636681	-79
73	Stonegate-Queensway (16)	16	25,051	3199	2.40	7010	49002	2255	2390	43.635518	-79
82	Waterfront Communities-The Island (77)	77	65,913	8943	1.61	35675	54292	18180	16805	43.633880	-79

First, even though most of the neighborhoods in Etobicoke are in the same cluster as of neighborhoods in Downtown Toronto, the venues within the two Borough are different. However, they do have same level of similarities as well.

We may discuss our results under below main perspectives.

First, most common venues in Downtown Toronto are cafes and restaurants and Parks. Parks and restaurants are also a common venue in Etobicoke area.

Second, although restaurant is a common venue in both Borough, the cuisines might be very different, and further research need to be done on that. On the other hand, Etobicoke area has some hardware stores that Downtown doesn't have.

Conclusion

To sum up, the analysis above would support my moving decision from Etobicoke to Downtown Toronto.

From the population census perspective, Downtown Toronto has far more people with higher education, and more young people from age 25 to 40. The household income in Downtown is also a lot higher than in Etobicoke. However, the overall population in Downtown is higher than Etobicoke, so I may feel crowd if moving to Downtown.

From the venue's perspective, Downtown has more cafes and restaurants than the area I live.

Overall, Downtown is more suitable for young professionals or people looking for more social life and likes the busy part of the city.