



Renting Prices and Neighborhood Analysis of Toronto

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Presentation

1. Introduction
2. Data Preprocessing
3. Exploring areas
4. Conclusion



1.

Introduction

Introduction

- ◆ New life in Toronto – where should I move in?
- ◆ Salary: 60.000 CAD -> 3.750 net/month
- ◆ For renting - 1.250 CAD for 1 or 2 Bedroom flat
- ◆ One or more Grocery Store
- ◆ One or more Subway Station
- ◆ Park to chill
- ◆ Gym or Spa for Sport

Introduction

Strategy:

- ◆ Average renting prices based on neighborhoods in Toronto (web)
- ◆ Station Coordinates (web)
- ◆ Google Maps, Foursquare API
- ◆ Folium, geopy

The goal is to find the best area in Toronto city, which is similar as my place at home.



2. Data Preprocessing

Data Preprocessing

rentingPrices dataset

	Unnamed: 0	Bachelor	Unnamed: 2	1 Bedroom	Unnamed: 4	2 Bedroom	Unnamed: 6	3 Bedroom +	Unnamed: 8	Total	Unnamed: 10
0	Agincourt/Malvern	NaN	NaN	1105.0	b	1316.0	a	1569.0	a	1341.0	a
1	Ajax/Pickering	NaN	NaN	953.0	a	1248.0	a	1397.0	a	1283.0	a
2	Alderwood	NaN	NaN	1169.0	c	1462.0	c	NaN	NaN	1435.0	c
3	Aurora	NaN	NaN	1127.0	a	1347.0	a	NaN	NaN	1298.0	b
4	Banbury-Don Mills/York Mills	NaN	NaN	1163.0	a	1335.0	b	1643.0	c	1286.0	b



	Neighborhood	1 Bedroom	2 Bedroom
0	Agincourt/Malvern	1105.0	1316.0
1	Ajax/Pickering	953.0	1248.0
2	Alderwood	1169.0	1462.0
3	Aurora	1127.0	1347.0
4	Banbury-Don Mills/York Mills	1163.0	1335.0



	Neighborhood	Price	Bedrooms
0	Agincourt/Malvern	1105.0	1
1	Ajax/Pickering	1248.0	2
2	Alderwood	1169.0	1
3	Aurora	1127.0	1
4	Banbury-Don Mills/York Mills	1163.0	1

Data Preprocessing

Splitting neighborhoods

	Neighborhood	Price	Bedrooms
0	Agincourt/Malvern	1105.0	1
1	Ajax/Pickering	1248.0	2
2	Alderwood	1169.0	1
3	Aurora	1127.0	1
4	Banbury-Don Mills/York Mills	1163.0	1



	Neighborhood	Price	Bedrooms
0	Agincourt	1105.0	1
1	Ajax	1248.0	2
2	Alderwood	1169.0	1
3	Aurora	1127.0	1
4	Banbury-Don Mills	1163.0	1



	Neighborhood	Price	Bedrooms
57	Lorne Park	1212.0	1
58	Malton	1181.0	2
59	Malvern	1105.0	1
60	Maple Leaf	1196.0	2
61	Markham	1213.0	1
62	Milliken	1136.0	1

Data Preprocessing

Coordinates:

- ◆ Google Maps API
- ◆ Geopy - Geolocator

	Neighborhood	Latitude	Longitude
0	Agincourt	43.788009	-79.283882
1	Ajax	43.850855	-79.020373
2	Alderwood	43.601710	-79.545238
3	Aurora	44.006480	-79.450396
4	Banbury-Don Mills	43.749115	-79.366359

```
#Lat and Lon of Toronto, using geolocator
address = 'Toronto, Ontario'

geolocator = Nominatim(user_agent="toronto_ontario")
location = geolocator.geocode(address)
toronto_latitude = location.latitude
toronto_longitude = location.longitude
print('The coordinates of Toronto are {}, {}'.format(toronto_latitude, toronto_longitude))
```

```
The coordinates of Toronto are 43.653963, -79.387207.
```

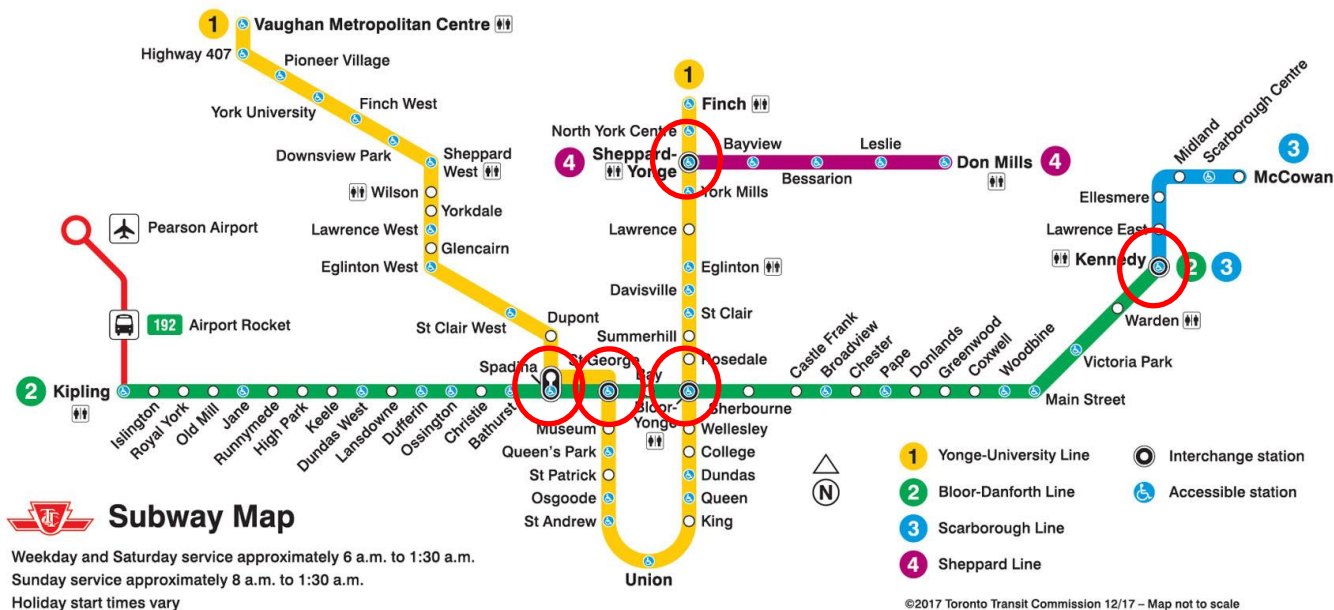
Data Preprocessing

Subway Stations

```
subway1 = pd.read_csv('bloor-danforth-NAD83.csv', header=None)
subway2 = pd.read_csv('sheppard-yonge-NAD83.csv', header=None)
subway3 = pd.read_csv('srt-NAD83.csv', header=None)
subway4 = pd.read_csv('yonge-university-spadina-NAD83.csv', header=None)
```

	Latitude	Longitude	Station
0	43.638020	-79.536388	Kipling
1	43.645950	-79.523948	Islington
2	43.648804	-79.511541	Royal York
3	43.650576	-79.495225	Old Mill
4	43.650291	-79.484772	Jane

Data Preprocessing

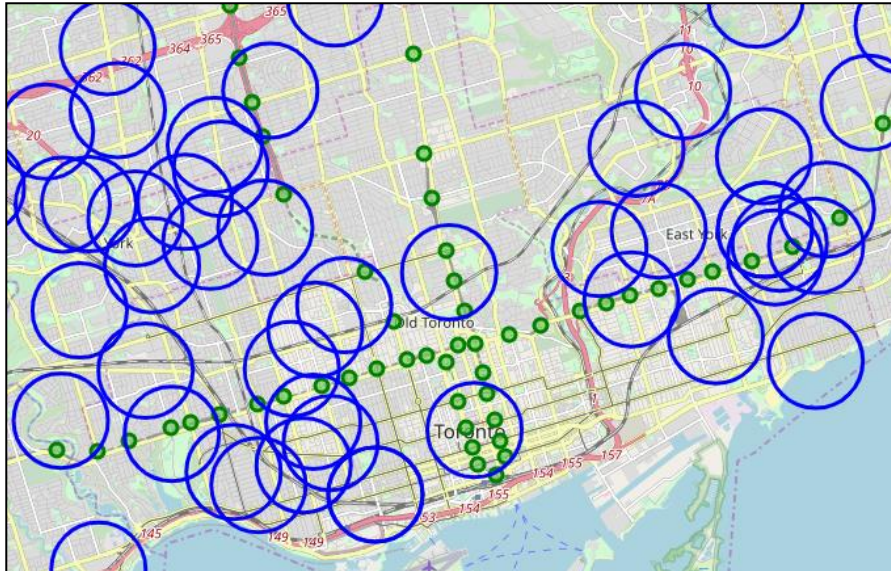


https://www.ttc.ca/Spadina/images/about%20the%20project/SubwayFutureMap_lg.jpg

Data Preprocessing

Folium

Neighborhood vs Subway Station



Data Preprocessing

Counting Subway Stations

```
stationNumbers = []  
  
for i in range(0, len(df_toronto)):  
    counter = 0  
    coords_1 = (df_toronto['Latitude'][i], df_toronto['Longitude'][i])  
  
    for j in range(0, len(torontoSubway)):  
        coords_2 = (torontoSubway['Latitude'][j], torontoSubway['Longitude'][j])  
        distance = geodesic(coords_1, coords_2).km  
        if (distance <= 1):  
            counter = counter + 1  
  
    stationNumbers.append(counter)  
  
df_toronto['Station Number'] = stationNumbers
```

```
df_toronto = df_toronto[df_toronto['Station Number'] >= 1].reset_index(drop=True)
```

	Neighborhood	Price	Bedrooms	Latitude	Longitude	Station Number
0	City Centre South	1196.0	1	43.654262	-79.385975	8
1	Clairlea-Birchmount	1056.0	1	43.716205	-79.282842	1
2	Crescent Town	1096.0	1	43.695981	-79.293736	1
3	Danforth Village-East York	1248.0	2	43.689136	-79.296554	2
4	Dorset Park	1139.0	2	43.765831	-79.281111	2

21 Neighborhoods left



3. Exploring areas

Exploring areas

Foursquare API:

- ◆ Limit 100
- ◆ Radius 500

Neighborhood	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
City Centre South	100	100	100	100	100	100
Clairlea-Birchmount	7	7	7	7	7	7
Crescent Town	5	5	5	5	5	5
Danforth Village-East York	28	28	28	28	28	28
Dorset Park	14	14	14	14	14	14
Dovercourt	9	9	9	9	9	9
Dufferin Grove	35	35	35	35	35	35
Englemount-Lawrence	4	4	4	4	4	4
Georgina	52	52	52	52	52	52
High Park-Swansea	14	14	14	14	14	14
Ionview	9	9	9	9	9	9
Islington	10	10	10	10	10	10
Lambton Baby Point	4	4	4	4	4	4
Milton	25	25	25	25	25	25
Newmarket	20	20	20	20	20	20
Oakwood-Vaughan	6	6	6	6	6	6
Playter Estates-Danforth	17	17	17	17	17	17
Riverdale	67	67	67	67	67	67
Woodbine Corridor	5	5	5	5	5	5
Woodbine-Lumsden	5	5	5	5	5	5
Wychwood	8	8	8	8	8	8

Exploring areas

The most important venues:

- ◆ Park
- ◆ Grocery Store
- ◆ Gym or Gym/Fitness Center, Spa (for swimming)
- ◆ Shopping Mall

	Park	Grocery Store	Gym	Gym / Fitness Center	Spa	Shopping Mall
Neighborhood						
City Centre South	0	0	1	1	1	1
Clairlea-Birchmount	0	0	1	0	0	0
Crescent Town	1	0	0	0	0	0
Danforth Village-East York	1	0	0	2	0	0
Dorset Park	0	1	0	0	0	0

Exploring areas

Select neighborhoods along venues

	Park	Grocery Store	Gym / Fitness Center	Spa	Shopping Mall	Number of Venue Type
Neighborhood						
Georgina	2	1	2	2	0	4
City Centre South	0	0	2	1	1	3
Riverdale	0	2	1	1	0	3
Danforth Village-East York	1	0	2	0	0	2
Dovercourt	2	0	1	0	0	2
Dufferin Grove	1	0	1	0	0	2
Lambton Baby Point	2	0	0	0	0	1
Woodbine-Lumsden	0	0	0	1	0	1
Woodbine Corridor	0	0	0	1	0	1
Playter Estates-Danforth	0	1	0	0	0	1
Oakwood-Vaughan	0	1	0	0	0	1
Newmarket	0	2	0	0	0	1
Wychwood	1	0	0	0	0	1
Clairlea-Birchmount	0	0	1	0	0	1
Dorset Park	0	1	0	0	0	1
Crescent Town	1	0	0	0	0	1
Milton	0	0	0	0	0	0
Islington	0	0	0	0	0	0

Exploring areas


Final Decision

	Park	Grocery Store	Gym / Fitness Center	Spa	Shopping Mall	Number of Venue Type
Neighborhood						
City Centre South	0	0	2	1	1	3
Georgina	2	1	2	2	0	4
Riverdale	0	2	1	1	0	3

```
In [58]: toronto_final.sort_values(by = 'Number of Venue Type', ascending=False)
```

```
Out[58]:
```

	Neighborhood	Price	Bedrooms	Latitude	Longitude	Station Number	Park	Grocery Store	Gym / Fitness Center	Spa	Shopping Mall	Number of Venue Type
1	Georgina	1008.0	2	43.684144	-79.392643	3	2	1	2	2	0	4
0	City Centre South	1196.0	1	43.654262	-79.385975	8	0	0	2	1	1	3
2	Riverdale	1189.0	1	43.678985	-79.344910	3	0	2	1	1	0	3



4. Conclusion

Conclusion

- ◆ Georgina has 4 Venues of 5 (Park, Grocery Store, Gym, Spa)
- ◆ 1.008 CAD
- ◆ 2 Bedrooms
- ◆ 3 Subway Stations

```
In [58]: toronto_final.sort_values(by = 'Number of Venue Type', ascending=False)
```

```
Out[58]:
```

	Neighborhood	Price	Bedrooms	Latitude	Longitude	Station Number	Park	Grocery Store	Gym / Fitness Center	Spa	Shopping Mall	Number of Venue Type
1	Georgina	1008.0	2	43.684144	-79.392643	3	2	1	2	2	0	4
0	City Centre South	1196.0	1	43.654262	-79.385975	8	0	0	2	1	1	3
2	Riverdale	1189.0	1	43.678985	-79.344910	3	0	2	1	1	0	3

A gravel path winds through a lush green forest. The path is bordered by rustic wooden fences on both sides. The trees are tall and dense, with sunlight filtering through the leaves. In the top left corner, there are overlapping green and teal geometric shapes. In the bottom right corner, there are overlapping teal and light green geometric shapes. The text "Thank you for your attention!" is centered over the path in a white, sans-serif font.

Thank you for your attention!