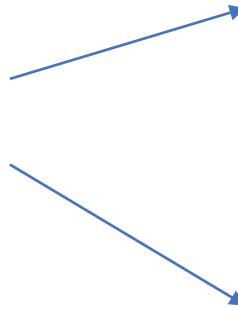# Relationship of Income and Robbery in Toronto

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1. Introduction/Business problem

- A restaurant is key service for people who want to live special or who do not have a time to make own meals. However, restaurants are threatened by some criminals. They can kill some innocence person or robbery shops, etc. To avoid those danger, this study is based on helping people planning to open a new restaurant in Toronto to choose the right location by providing data about the income and crime rate of each neighborhood for weighing safety and richness. There are many people in Toronto with high density. it is recommended to make their restaurant safe. In fact, safety cannot cover everything. Income is important too. Therefore, analyzing those two can make critical ways to solution.
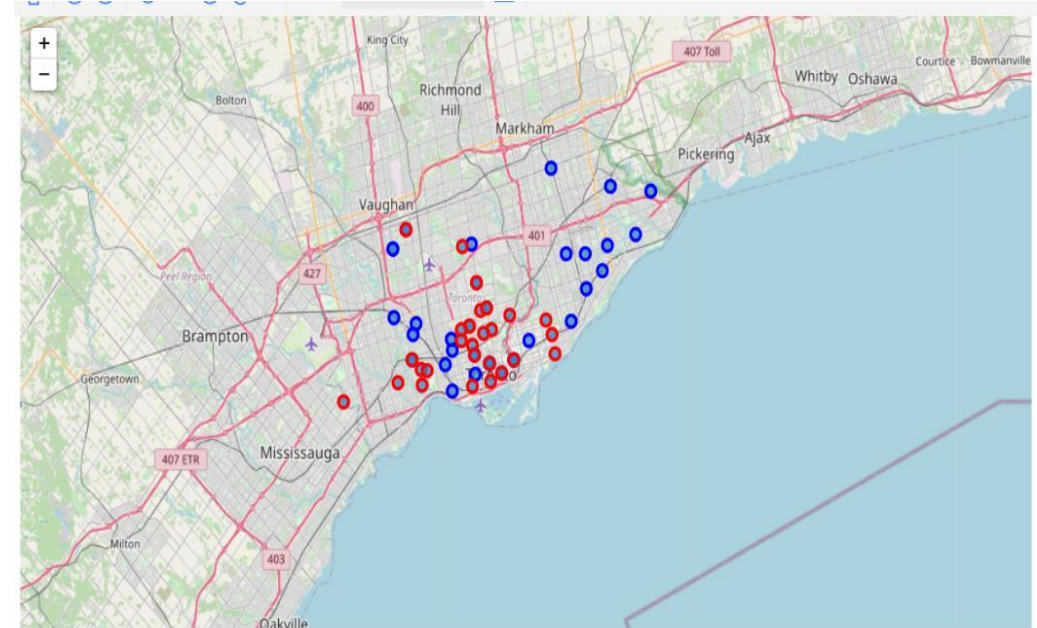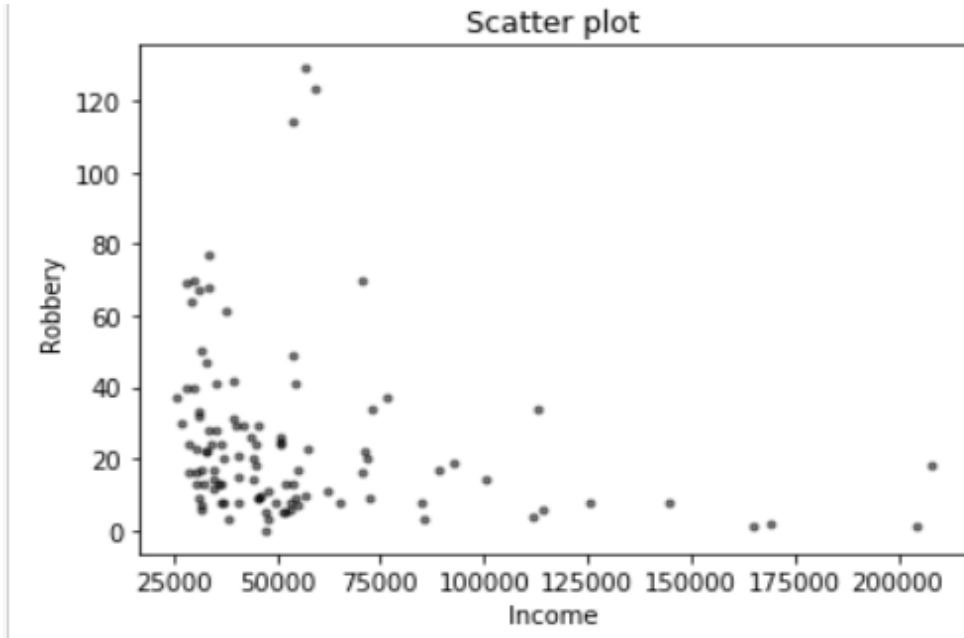
2. Data

1) Toronto's 2016 Census(***https://www.toronto.ca/city-government/data-research-maps/open-data/open-data-catalogue/#8c732154-5012-9afe-d0cd-ba3ffc813d5a***)

2) Toronto's 2016 crime rate(https://opendata.arcgis.com/datasets/af500b5abb7240399853b35a2362d0c0_0.csv?outSR=%7B%22latestWkid%22%3A26717%2C%22wkid%22%3A26717%7)

- Obtain data line: neighborhood, income_2016, robbery_2016
- Add data line: address, geolocation

3. Methodology

- 1. Use scatterplot to analyze relationship(linear or nonlinear)

- 2. Use folium map to mark featured neighborhood for each factor.(High income, High robbery)

- used data(head)

	Neighbourhood	Borough	Income_2016	Robbery_2016	address	Coordinates	latitude	longitude
0	Agincourt North	Toronto	30,414	13	Toronto,Agincourt North	(Agincourt North, Scarborough North, Scarborou...	43.808038	-79.266439
2	Alderwood	Toronto	47,709	11	Toronto,Alderwood	(Alderwood, Etobicoke—Lakeshore, Etobicoke, To...	43.601717	-79.545232
3	Annex	Toronto	112,766	34	Toronto,Annex	(The Annex, University—Rosedale, Toronto, Gold...	43.670338	-79.407117
5	Bathurst Manor	Toronto	45,936	10	Toronto,Bathurst Manor	(Bathurst, Poulters Place, University—Rosedale...	43.665519	-79.411937
6	Bay Street Corridor	Toronto	56,526	129	Toronto,Bay Street Corridor	(Toronto Star, Metro, Bay Street, Church-Welle...	43.662844	-79.386311

4. Results

- Higher income, lower robbery.
- There are different neighborhood group between high income and high robbery.

5. Discussion/ Conclusion

- Because it is hard to obtain json file, I just used foilum and market and a simple plot. There is a significant finding in this report. There is a high-income restaurant with low robbery rate. Also, those neighborhood are clustered approximately by 3 group. It is hard to cluster in my skills and not enough time. This is very bad. But I did my best to show their relationship.

- Despite of this study's weakness about analyzing diverse, it shows meaningful relationship. According to data, if there are high income restaurant, they are safe than other neighborhoods. If our stakeholders are willing to open the restaurant, I'll recommend those places. Safety is most important.