CRIME DATA ANALYSIS IN THE CITY OF TORONTO

**A Project work for the course CSDA 1000 Introduction to Big Data – Winter 2020**

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# Introduction/Background.

Crime in Toronto has been relatively low in comparison to other major cities. In 2017, a ranking of 60 cities by The Economist ranked Toronto as the fourth safest major city in the world and the safest major city in North America[1, 2]. A CEOWORLD magazine ranked Toronto as the 95th safest cities in the world for 2018, running behind several other major cities like Tokyo, Osaka, Singapore, Hong Kong and Taipei but ahead of any other city in North America, other than New York City[3]. However, in 2018, Toronto had the highest homicide rate among major Canadian cities[4]. Toronto’s reached a record high homicide number count, with a rate of 3.11 per 100,000 people, higher than the 3.05 per 100,000 people for that of New York City[5]. The number of homicides that year broke the homicide record that was set 27 years prior[6].

With the increase in the number of crimes taking place in Toronto, it will be helpful to have a clear insight into the trend and correlates to better inform law enforcement agencies and other concerned parties to take an appropriate measure. With this in mind, we are going to explore open data of crime from the Toronto Police Service dataset portal in order to investigate the following problems.

## Problem Statement:

To analyze and explore the Toronto Crime data set to understand trends and patterns that will help predict any future occurrences, possibly the spatial distribution and patterns. Specifically the project will be required to answer the following questions:

* Identifying the most common types of crime in toronto?
* Which neighborhoods experience the highest crime rates?
* How do crime rates fluctuate over time?
* How does the Socioeconomic status in a neighborhood affect crime rates?

# Methodology

## Data Set Description:

* A reported instance of crime in Toronto will be pulled from the Toronto Police Service Open Data for the time of 2014 - 2019.
* Census tract profile from Stats Canada Census Profiles API
* We will also pull a neighborhood profiles from the city of Toronto opendata.

## Statistical analysis

Python version 3.x will be used with appropriate packages to perform the following statistical analysis.

* Descriptive analysis
* Regression analysis
* Time Series analysis
* Spatial analysis

# Proposed Plan.

|  |  |  |
| --- | --- | --- |
| Activities | Time | Notes |
| Concept note preparation by the team | Feb 13-14 |  |
| Data extraction and cleaning | Feb 15-21 |  |
| Analysis | Feb 21-24 |  |
| Result summary and writeup | Feb 25-27 |  |
| Preparing resentation and Submition | Feb 28-29 |  |

# Reference/citation

1. <https://safecities.economist.com/safe-cities-index-2017/>. Available from: <https://safecities.economist.com/safe-cities-index-2017/>.

2. <https://web.archive.org/web/20170204085548/http://www.torontocrimemap.ca/>. Available from: <https://web.archive.org/web/20170204085548/http://www.torontocrimemap.ca/>.

3. <https://ceoworld.biz/2019/08/01/the-worlds-safest-cities-ranking-2019/>. Available from: <https://ceoworld.biz/2019/08/01/the-worlds-safest-cities-ranking-2019/>.

4. <https://www.huffingtonpost.ca/2018/11/20/toronto-homicide-rate-murder_a_23594924/>.

5. <https://www.ctvnews.ca/canada/stats-show-sharp-uptick-in-toronto-shootings-but-murder-rate-still-below-a-dozen-other-canadian-cities-1.4224142>. Available from: <https://www.ctvnews.ca/canada/stats-show-sharp-uptick-in-toronto-shootings-but-murder-rate-still-below-a-dozen-other-canadian-cities-1.4224142>.

6. <https://toronto.ctvnews.ca/toronto-s-most-deadly-year-a-look-at-the-96-homicide-victims-of-2018-1.4232568>. Available from: <https://toronto.ctvnews.ca/toronto-s-most-deadly-year-a-look-at-the-96-homicide-victims-of-2018-1.4232568>.