



GROUP 12

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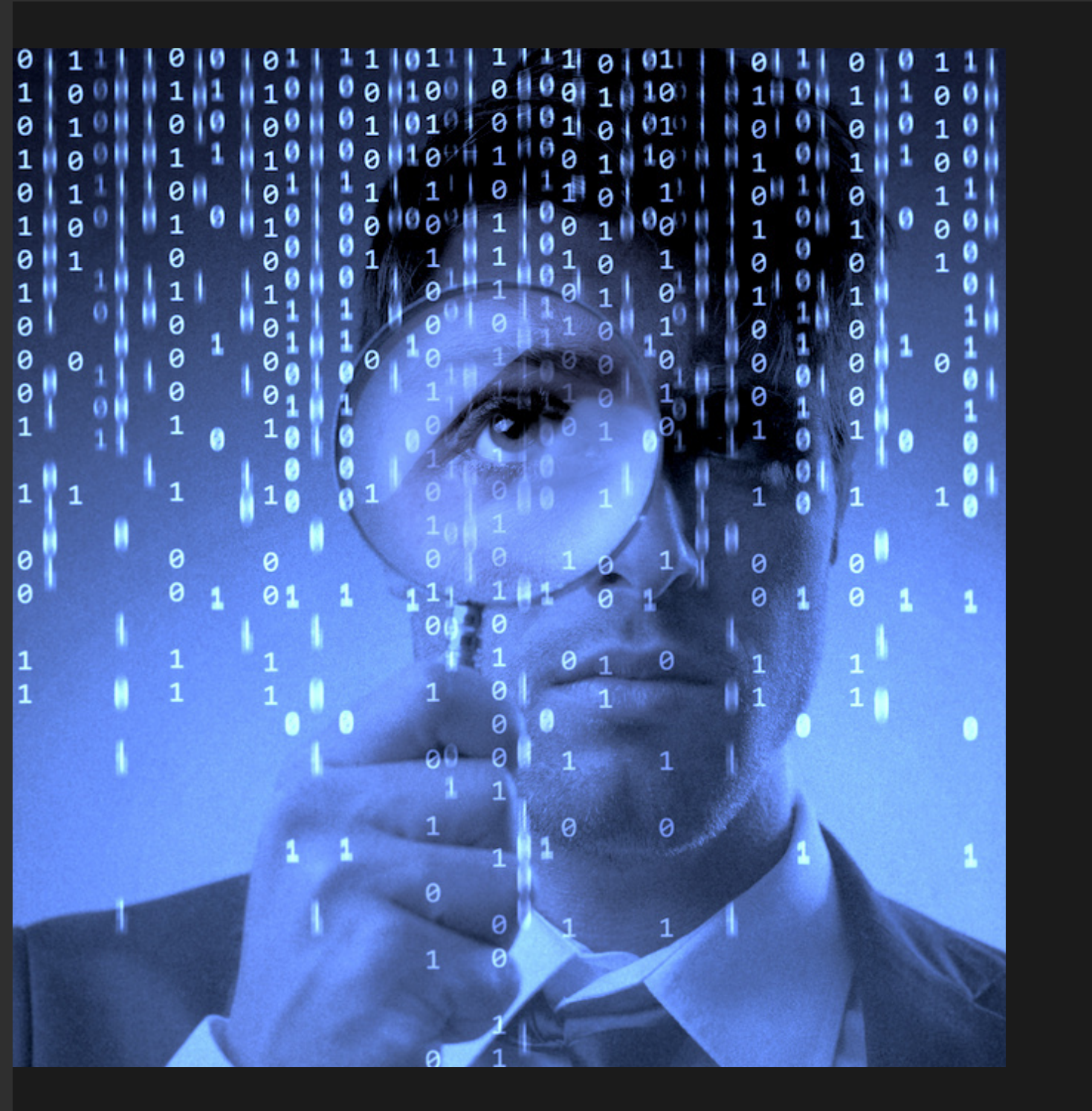
Predicting Crime in Chicago

Chicago is responsible for
almost half of the increase in
U.S. homicides in 2016

New York University's Brennan Center

How can you avoid becoming a victim?

What measures can you and the government take?



Importance of Problem

1

**INCREASE
PUBLIC SAFETY**

2

**OPTIMIZE RESOURCE
USAGE**

3

**REDUCE ECONOMIC
LOSS**

Our Data Set



CRIMES: 2001 TO PRESENT

SUBET: 2018 TO 2020

Source: Chicago Data Portal



PER CAPITA INCOME

Source: Chicago Data Portal

Overview of Variables

Variable

DATE & TIME

Year, month, date, time

Variable

CRIME TYPE

Description

Variable

LOCATION

Community, ward, latitude, longitude, etc

Variable

ECONOMIC FACTORS

Unemployment rate, hardship index, etc

Exploratory Analysis

Data Cleaning

1

**ADJUST DATA
TYPE(S)**

2

**SUBSET 2018 TO
2020 DATA**

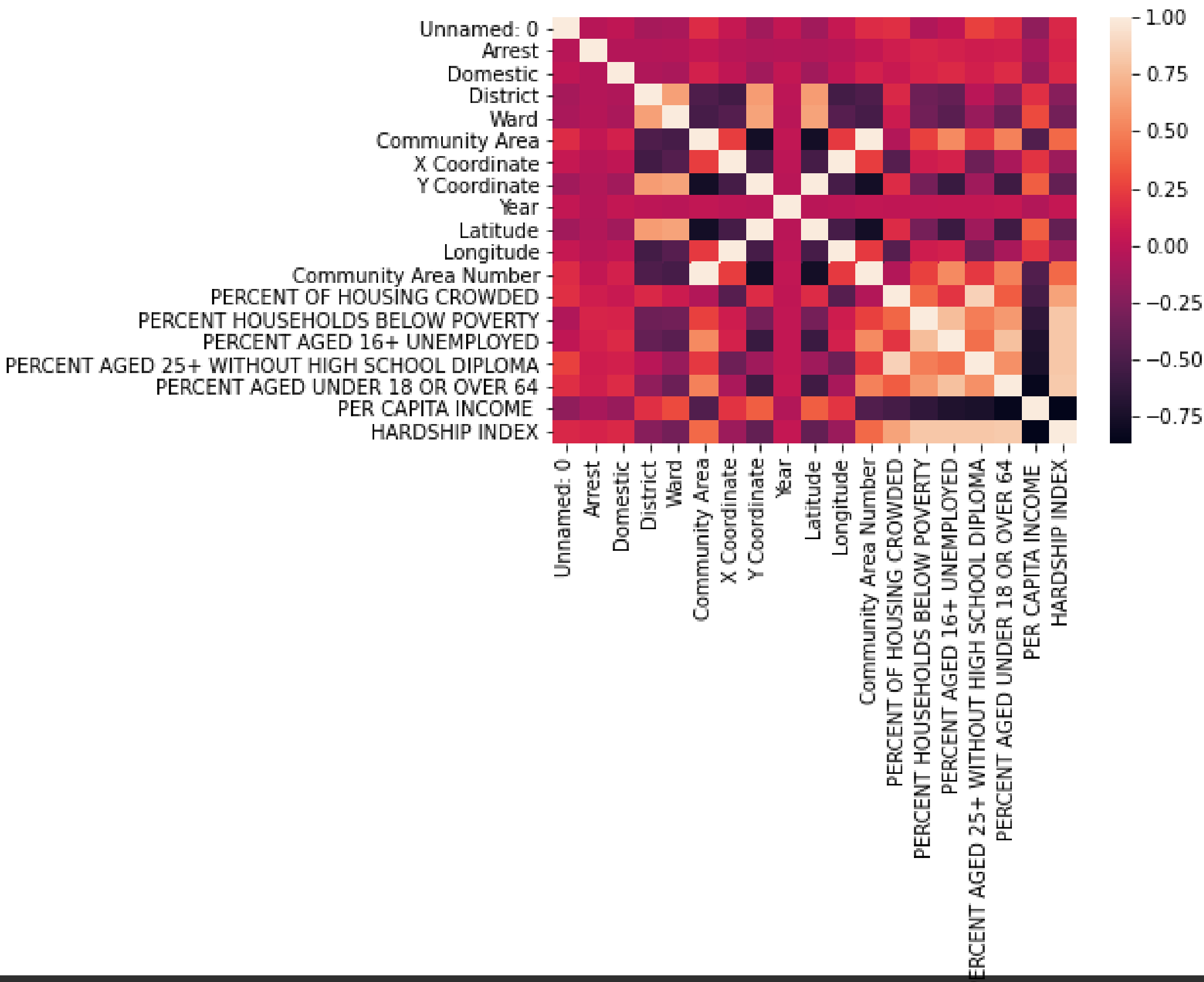
3

**JOIN ECONOMIC
INDICATORS**

4

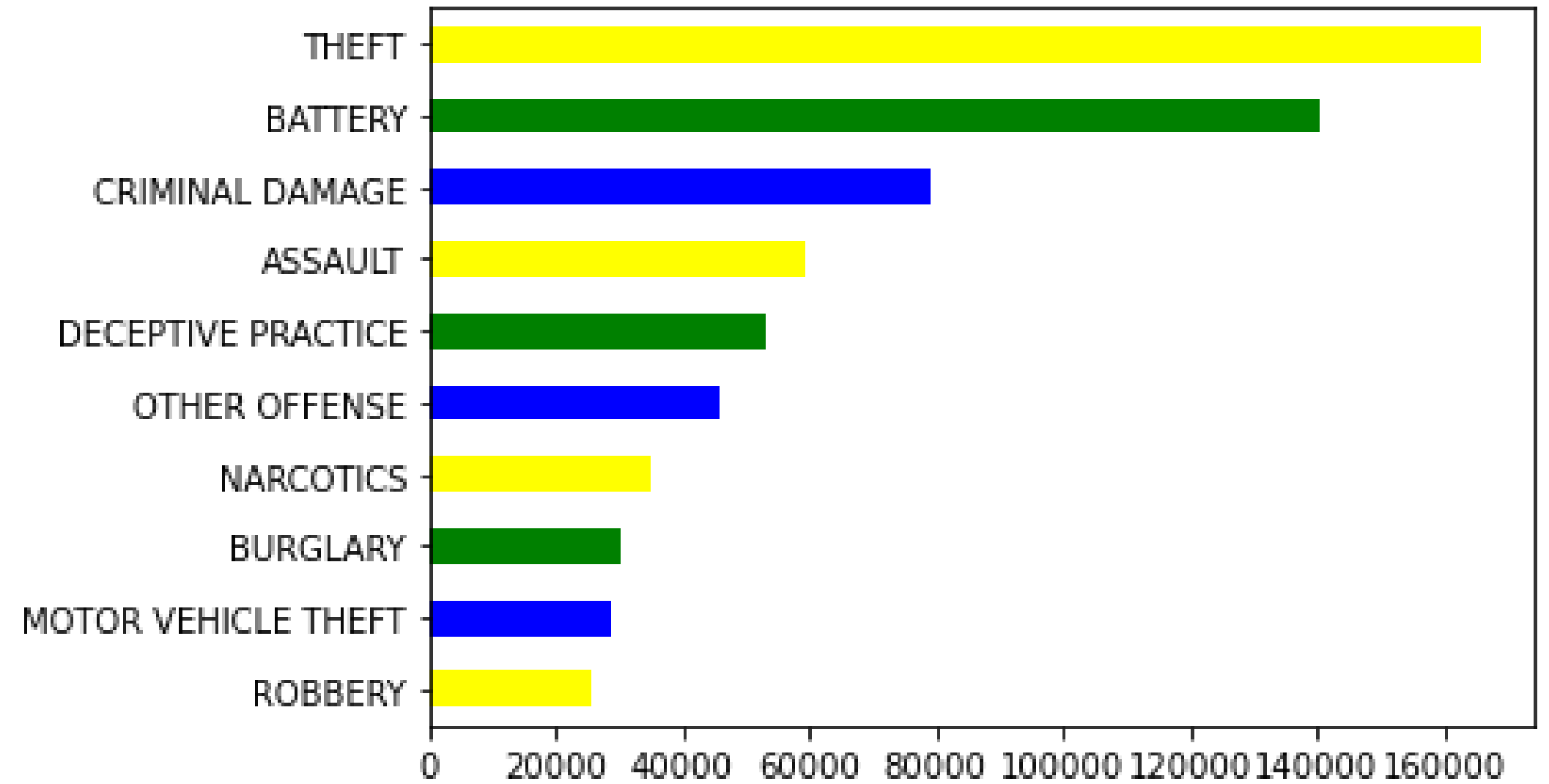
**DROP ROWS WITH
EMPTY LAT/LONG**

Correlation Plot



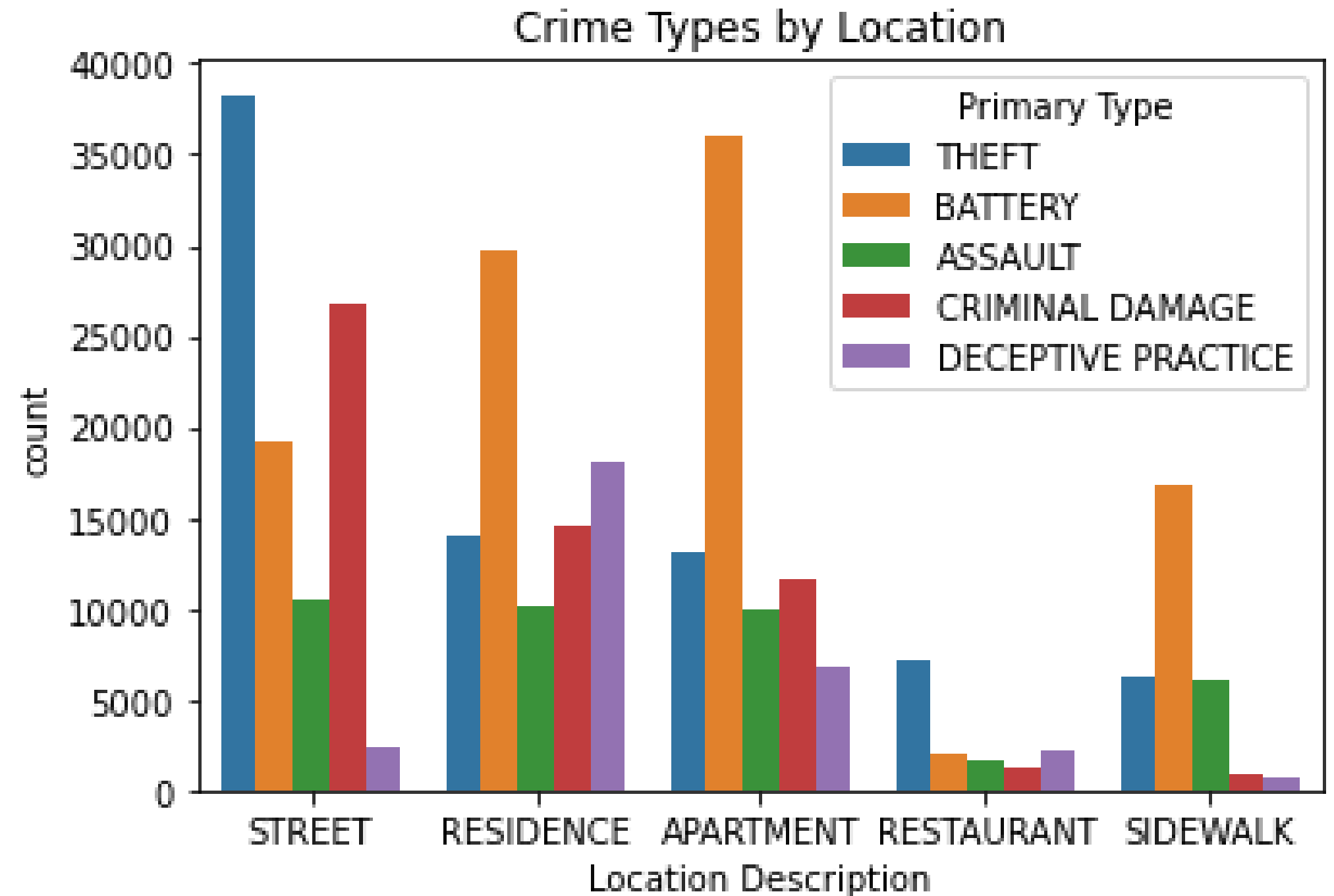
Crimes by Type

Most frequent crime types are THEFT, BATTERY, CRIMINAL DAMAGE, ASSAULT, DECEPTIVE PRACTICE.



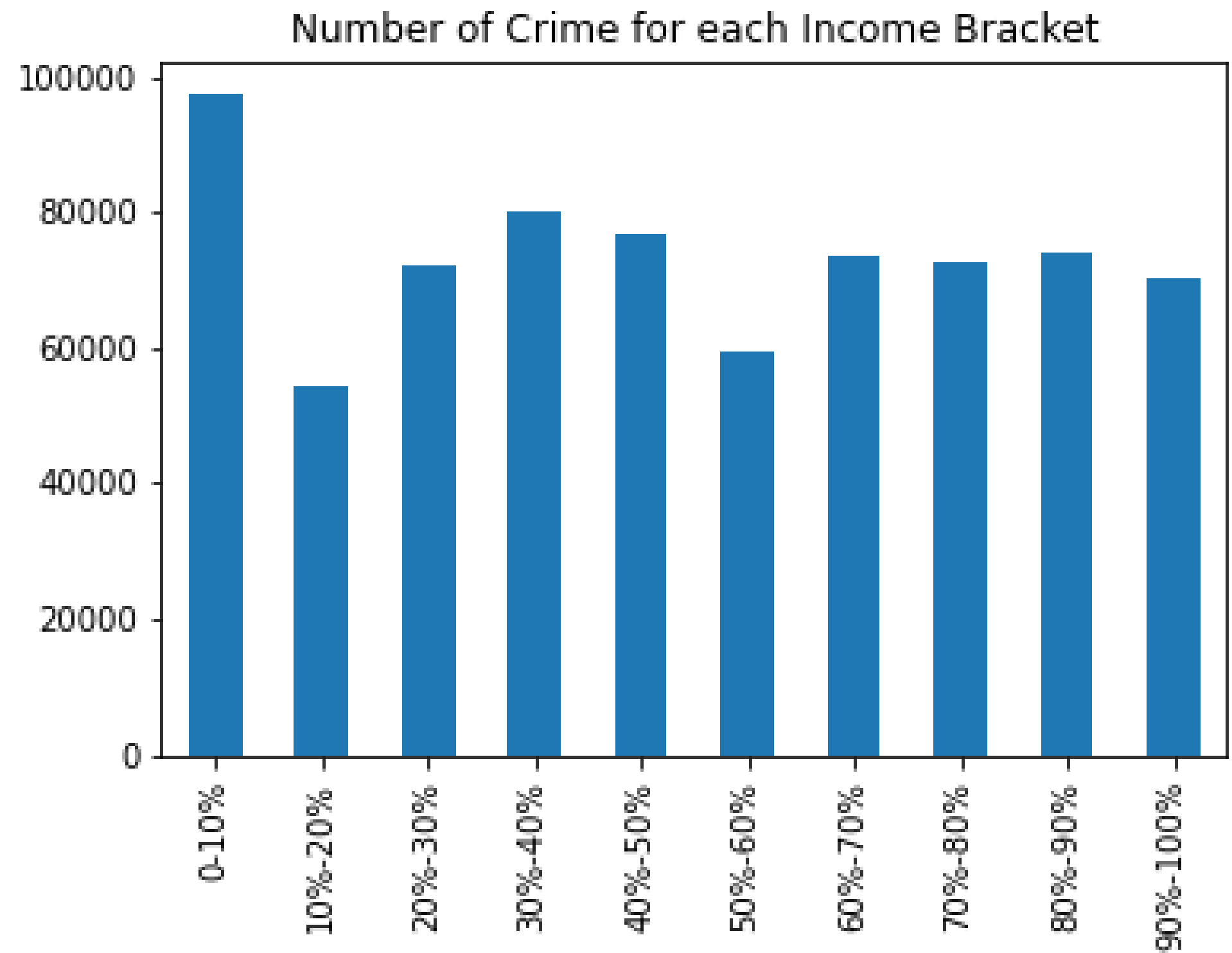
Crimes by Location

There are more THEFT crime on the streets, while in residential area, there is more BATTERY crime.



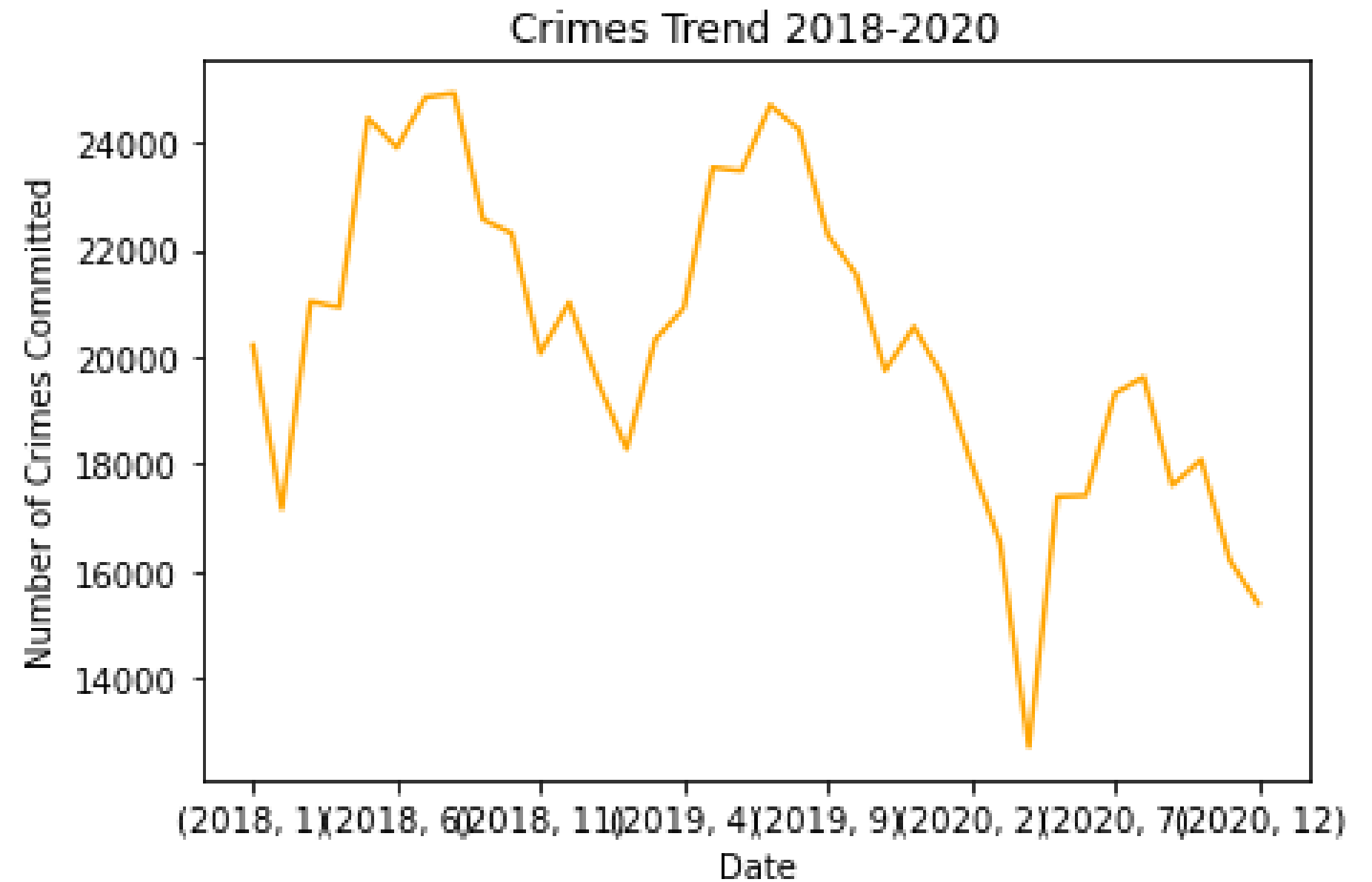
Crimes vs. Income

Areas in the lowest income bracket have the most crime.



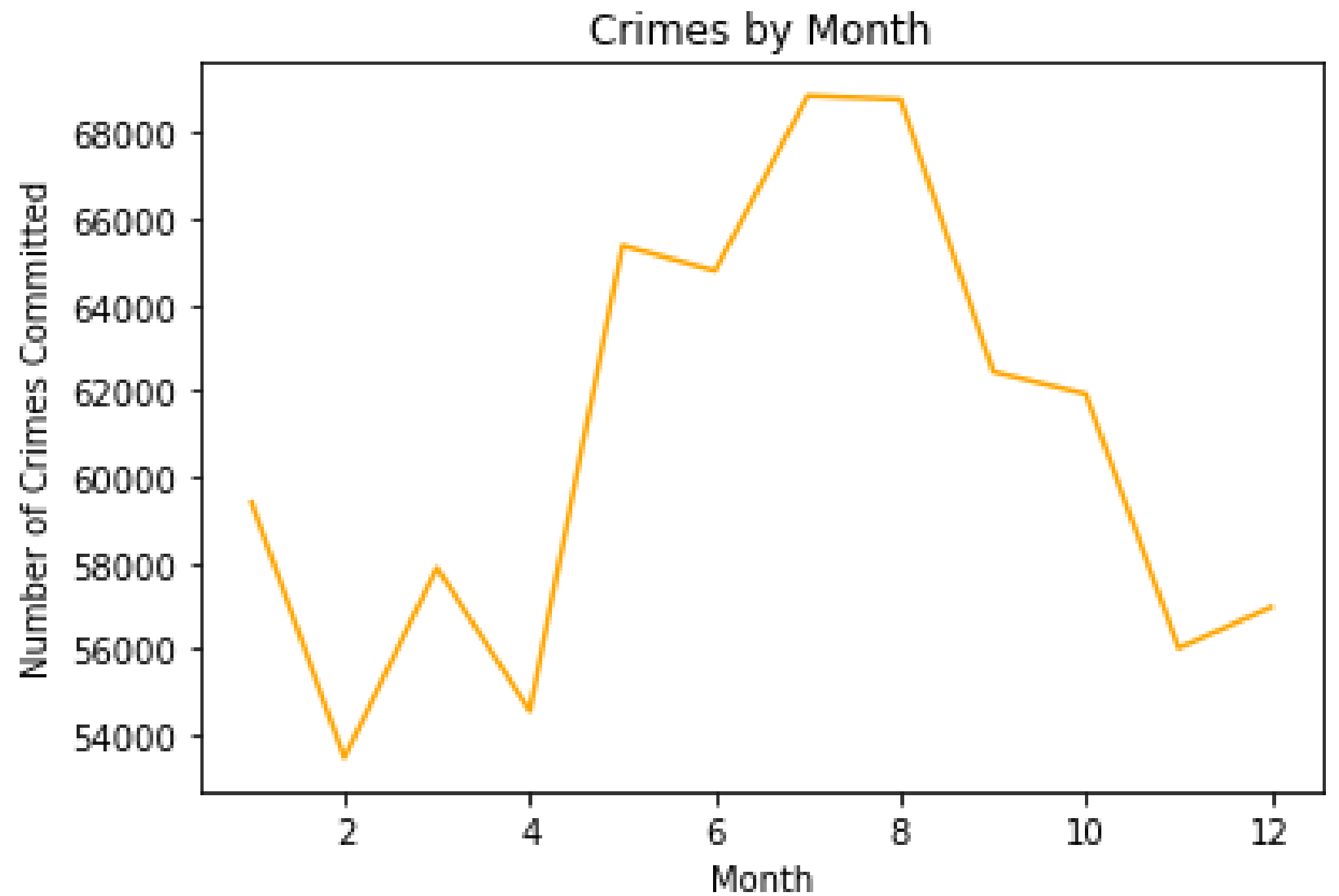
Trend of Crimes

There is a huge drop in crime during the beginning of the lockdown(s).



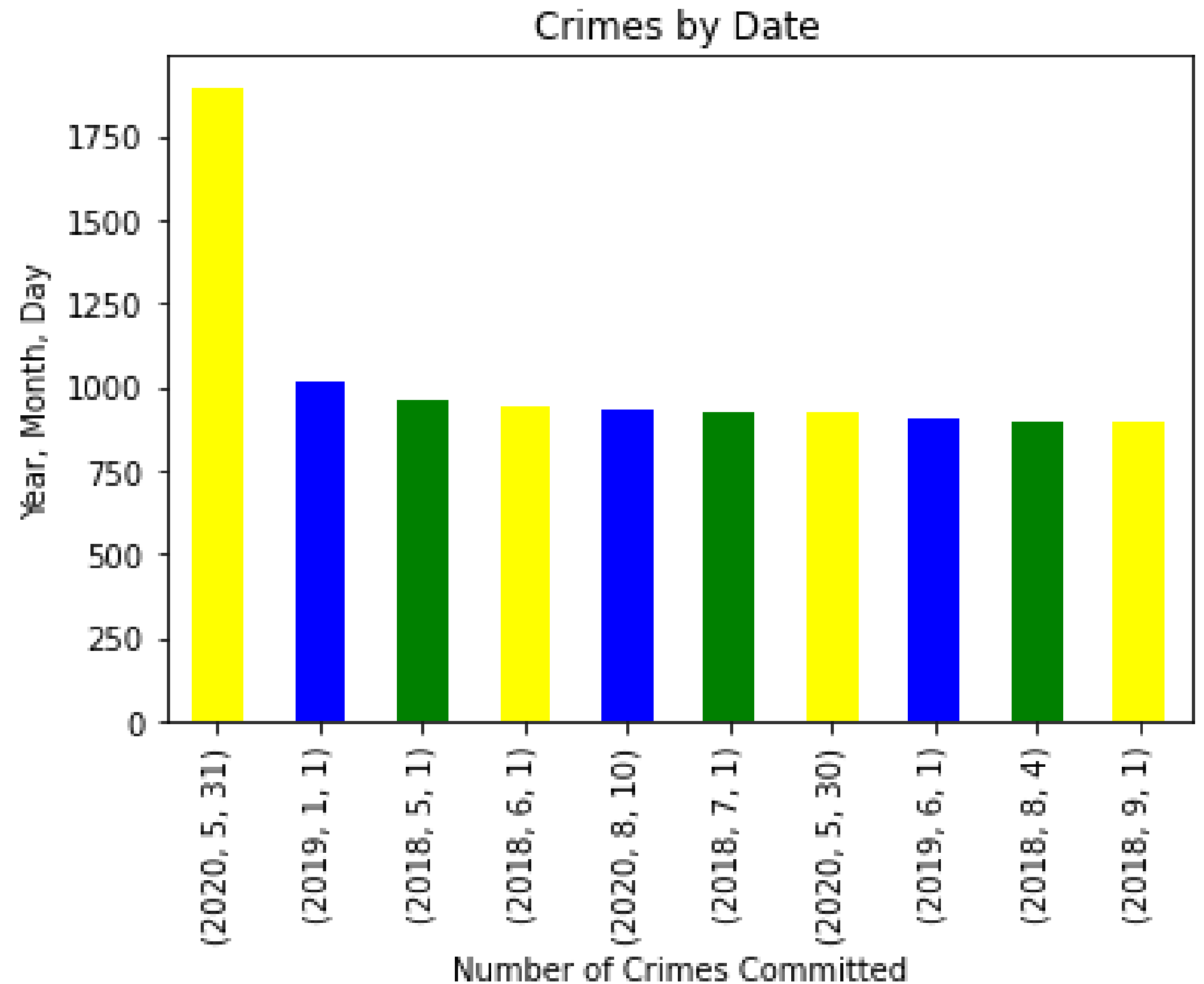
Crimes by Month

Total crime per month increase when the weather gets hotter.



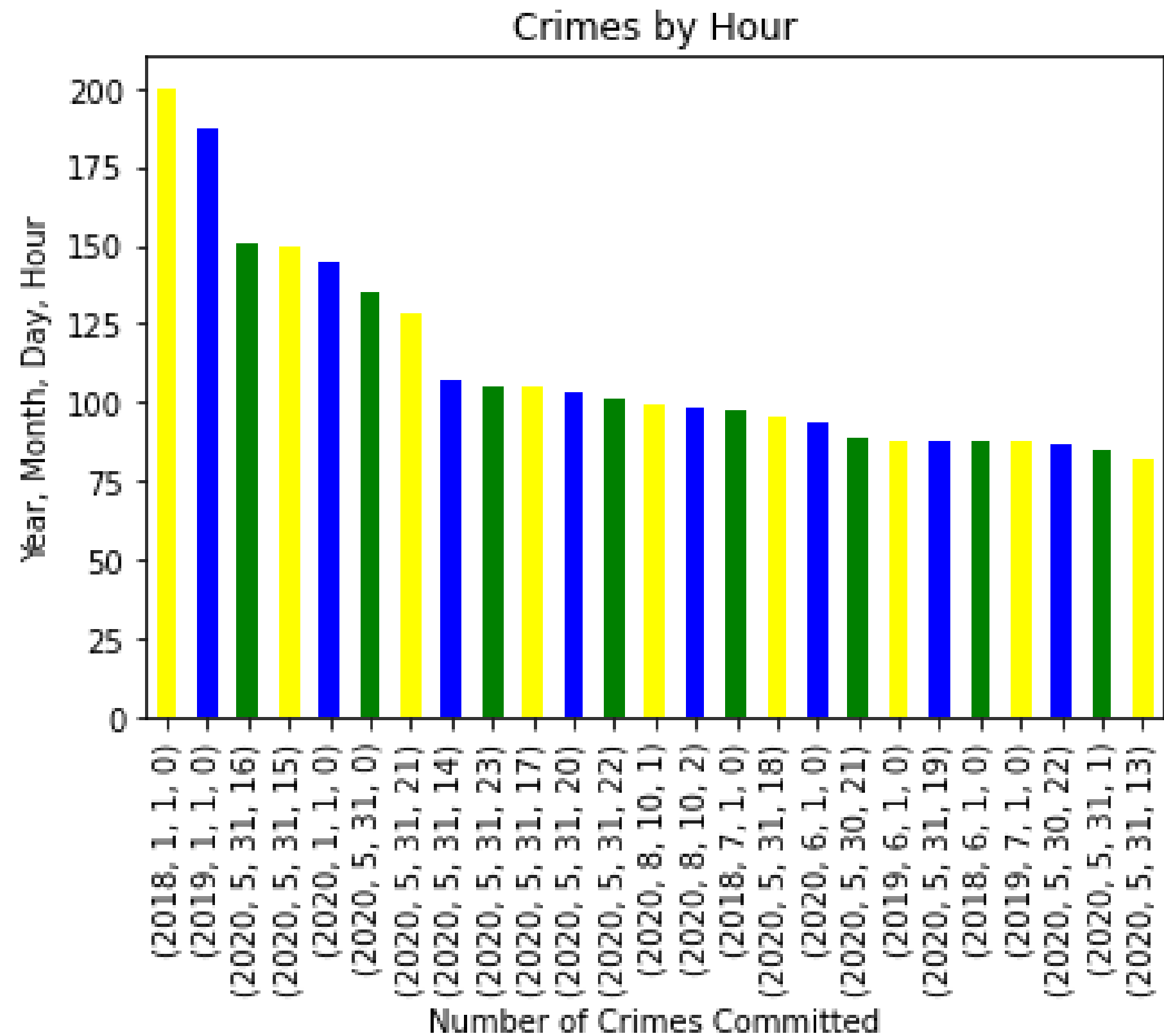
Crimes by Date

05/31 (George Floyd protests) had the highest crimes, followed by 2019/01/01.

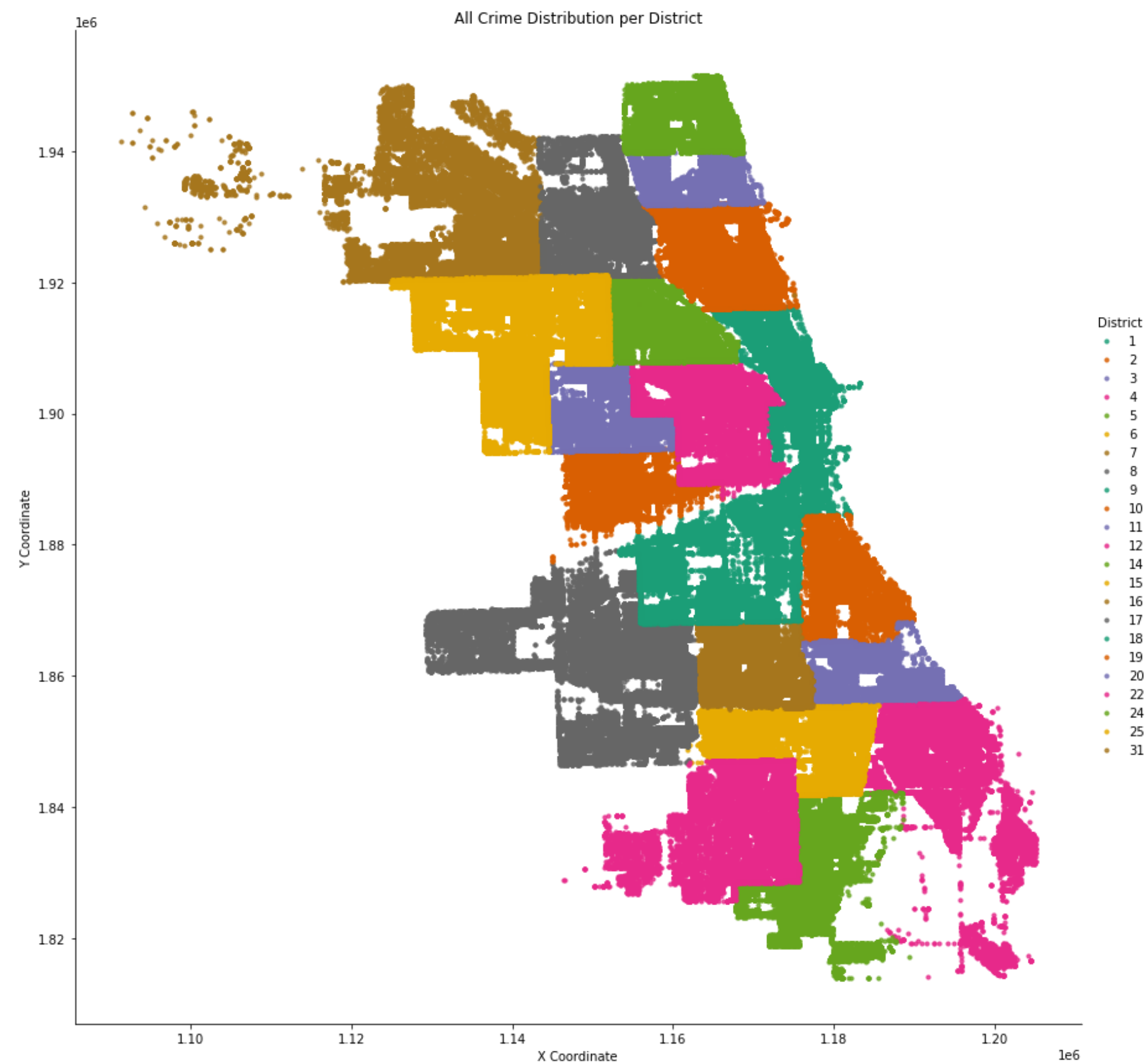


Crimes by Hour

The most crime infested hour is 12am-1am on New Years Day.



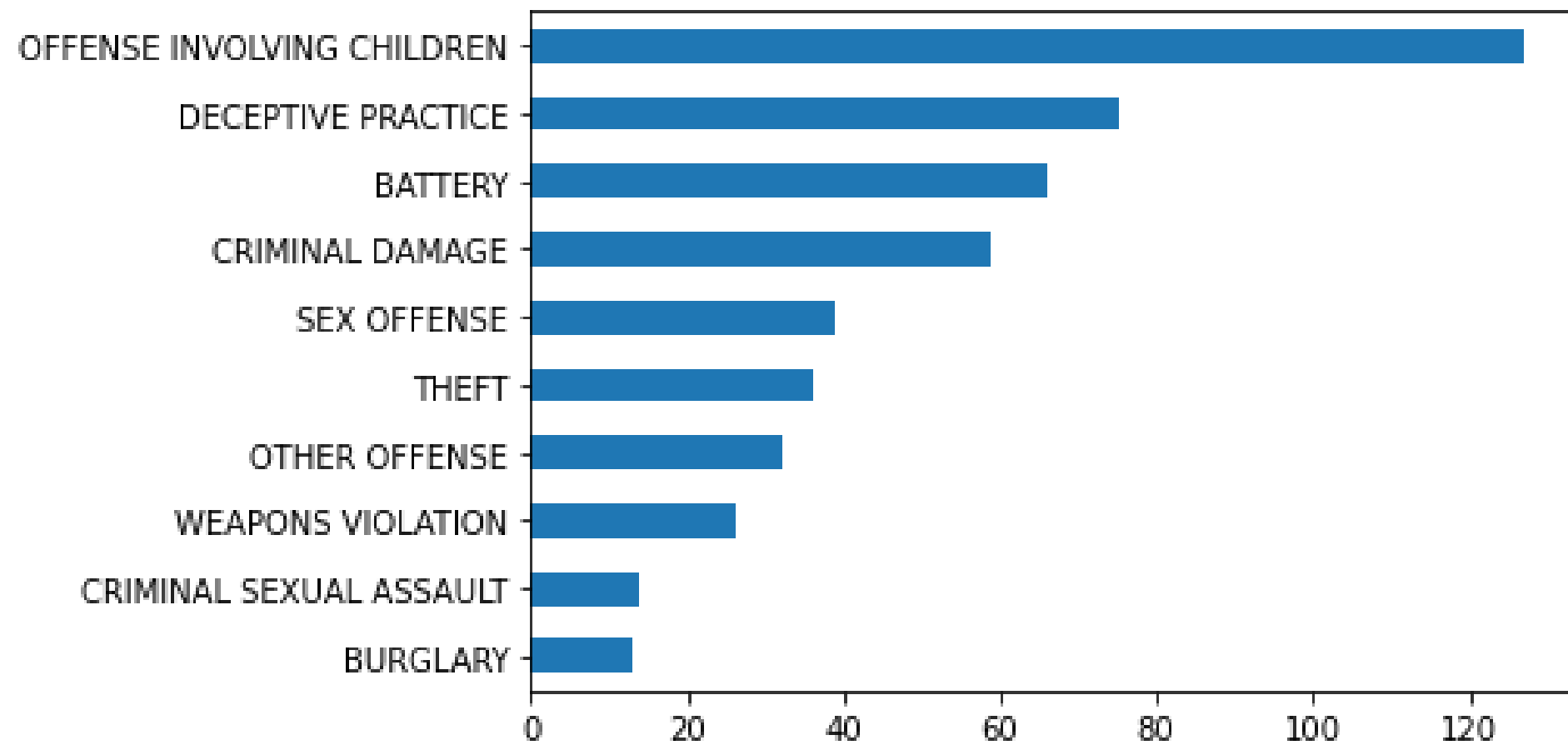
Crime Location



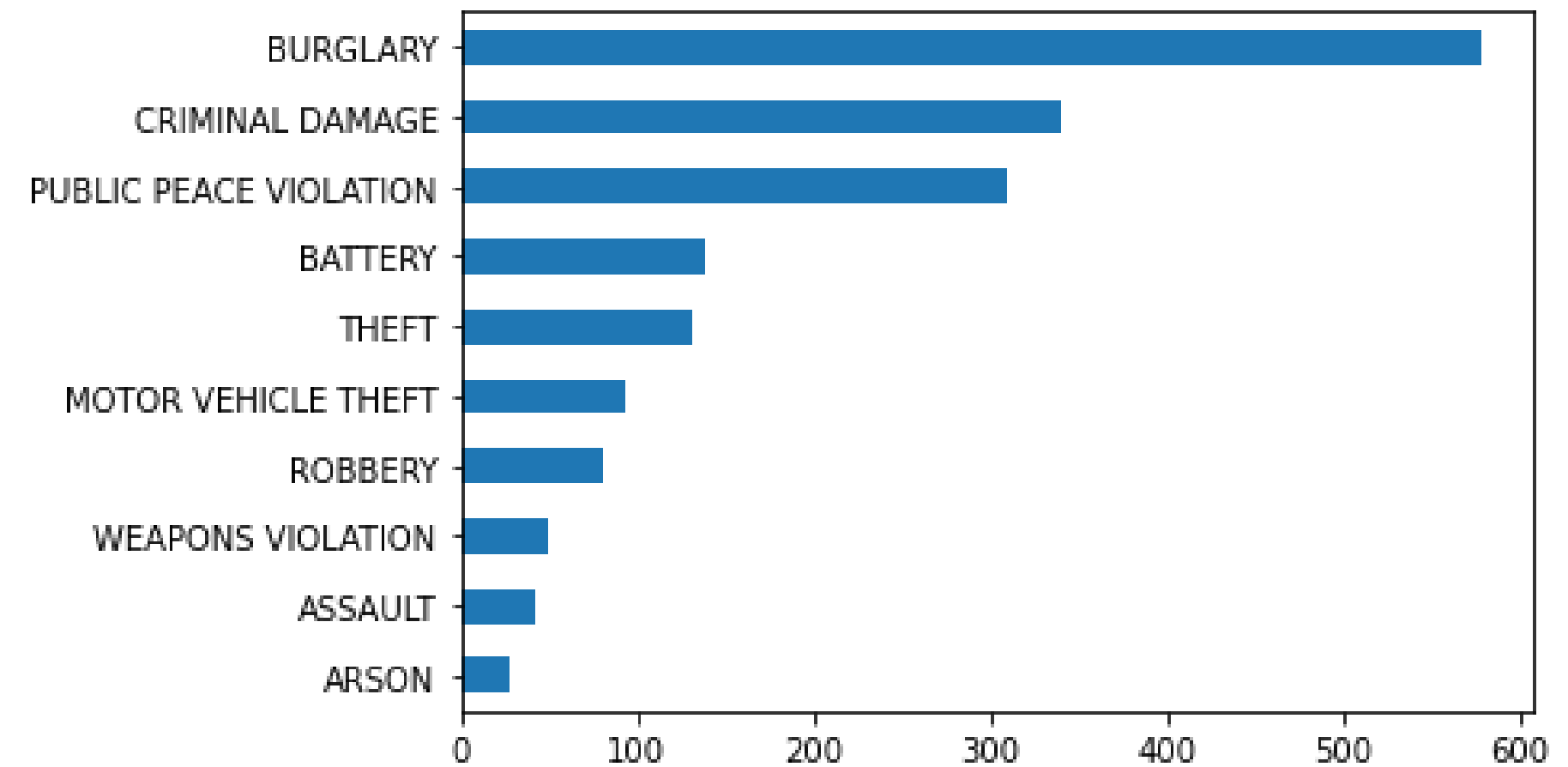
Crime Locations on New Year vs. BLM



Crime Type Comparison



New Year



George Floyd Protest

Insights

ALL CRIMES

- **THEFT**
- **BATTERY**
- **CRIMINAL DAMAGE**

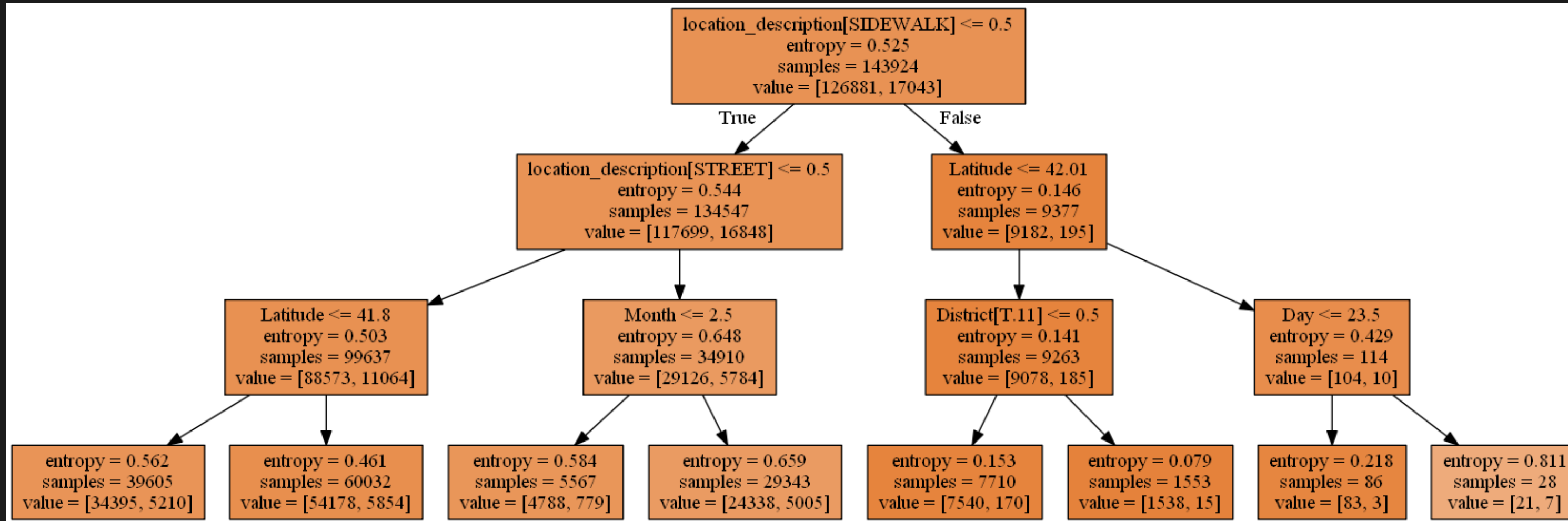
HOLIDAYS

- **OFFENSE INVOLVING CHILDREN**
- **DECEPTIVE PRACTICE**
- **BATTERY**

ANOMALIES

- **BURGLARY**
- **CRIMINAL DAMAGE**
- **PUBLIC PEACE VIOLATION**

Decision Trees



Criminal Damage Tree

Average Accuracy = **83%**

Logistic Regression

Average Accuracy = 83.2%

All Crimes

- Theft: 81.53%
- Battery: 80.08%
- Criminal Damage: 87.99%

Holidays

- Underage Offences : 88.37%
- Deceptive Practices: 81.40%
- Battery: 74.42%

Anomalies

- Burglary: 77.42%
- Criminal Damage: 84.05%
- Peace Violation: 86.74%

Logistic Regression

General

<i>Crime Type</i>	<i>Safe Areas</i>	<i>Dangerous Areas</i>
Theft	Sidewalks, Residences	Drug Stores, Porches
Battery	Retail Stores, Residences	CHA Apartments, Public Buildings
Damage	Sideways, Grocery Stores	Residence Yards, Streets

Logistic Regression

Holidays

<i>Crime Type</i>	<i>Safe Areas</i>	<i>Dangerous Areas</i>
Underage	Streets, Ward 12	Ward 37, Ward 20
Deception	Ward 2, Streets	Ward 11, District 14
Battery	Residences, Ward 6	Ward 38, District 9

Logistic Regression

Anomalies

<i>Crime Type</i>	<i>Safe Areas</i>	<i>Dangerous Areas</i>
Burglary	Streets, Sidewalks	Grocery Stores, District 25
Damage	Grocery Stores, Sidewalks	Ward 21, Ward 44
Public Peace	District 25, Residences	Retail Stores, Restaurants

Proposed Solutions

Evaluation Process

DATA EXPLORATION

- Income variables are negatively correlated to total crimes
- More unemployed individuals = more hardship and higher crime indexes.
- Only ~20% of all criminals are arrested

KEY FINDINGS

- Probability of being a victim significantly increases (+75% and +30% respectively) during protests and holidays
- Offenses involving children most prevalent on New Year's; Burglary, Theft and Arson take center stage during protests.
- Most crimes occur on the street, with apartments and residences following at a close second.

Solving the Spike in Crime

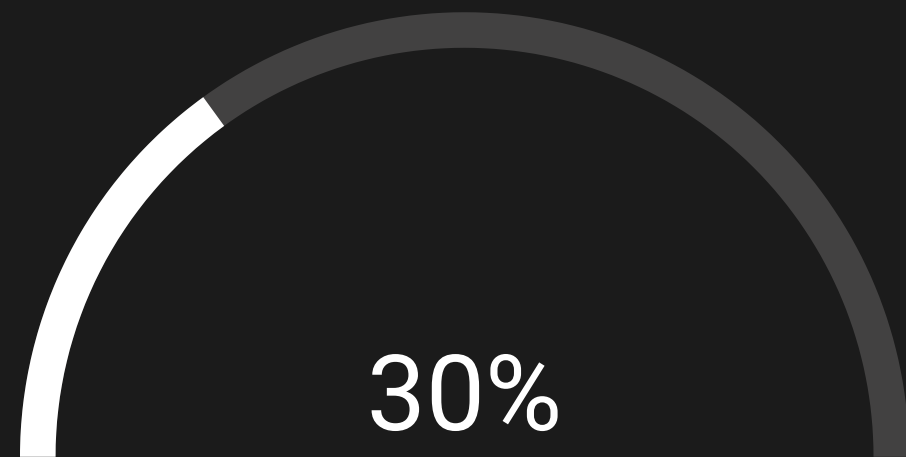
RESIDENTIAL CRIMES

- Create a helpline for anonymous domestic violence reporting.
- Formulate standard guidelines for neighborhood watch programs with clear escalation methods.

CITIZEN EDUCATION

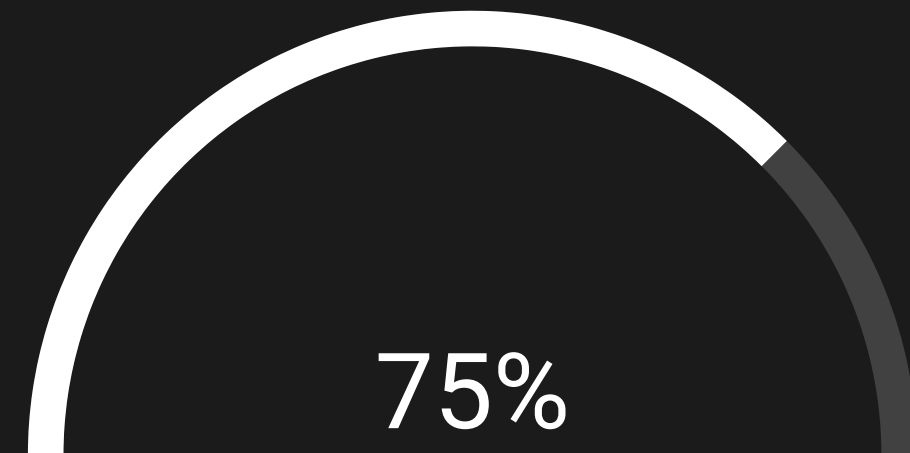
- Run more workshops and engagement programs in high crime areas to sensitize citizens
- Conserve resources through community involvement

Probability of Becoming a Victim



NEW YEARS

Underage Drinking, Tobacco Use



**GEORGE FLOYD
PROTESTS**

Burglary, Theft, Arson

Increase Efficiency of Chicago PD

ANOMALIES

Volunteer cops for handling less heinous crimes like underage drinking and tobacco usage.

ALLOCATE RESOURCES EFFECTIVELY

Assign more officers to high crime area and run more citizen education programs.

Thank You