



HOW TO GET AWAY WITH MURDER

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The Murder Accountability Project

- Gives police and the public access to datasets maintained by the Federal Bureau of Investigation
- We worked with the Supplementary Homicide Report from 1976 to the 2016

<http://www.murderdata.org/>

Goals:

- Help flag cases that are at risk of being unsolved

Data

Each row is a Homicide case

We have information about

- Victim (Sex/Ethnicity/Age)
- Perpetrator (Sex/Ethnicity/Age)
- Relationship
- Murder Weapon
- Location
- What type of agency had the case

Solved: 70%

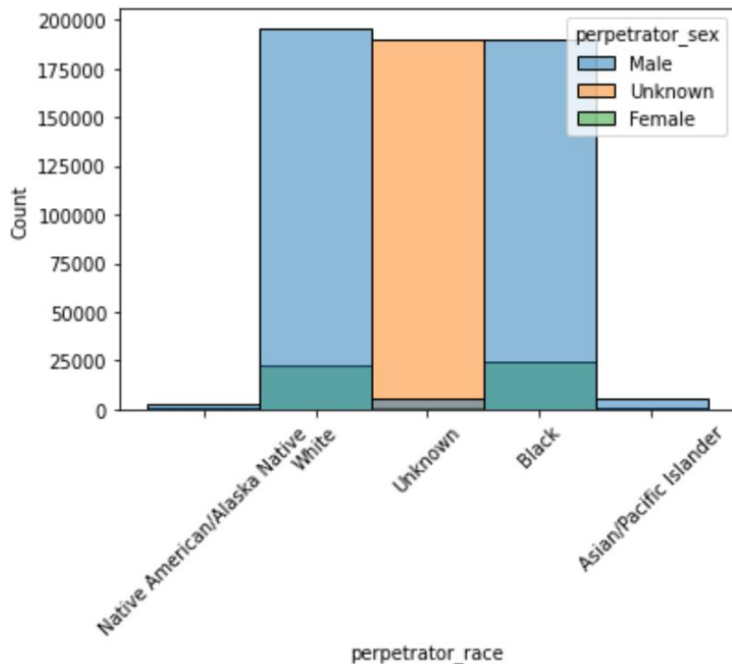
Unsolved: 30%



Who are the Perpetrators?

62% of all perpetrators were Male

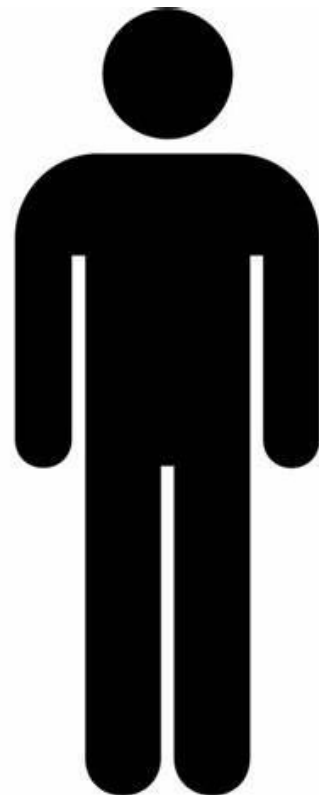
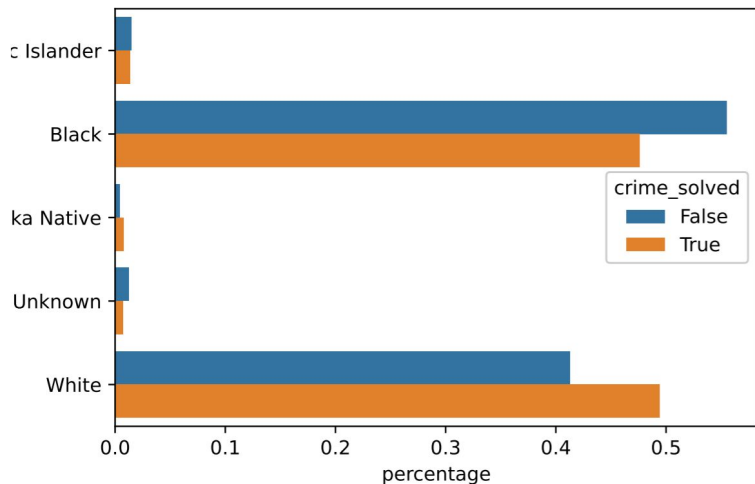
7.6% of all perpetrators were Female



Who are the Victims?

77% of all victims were Male

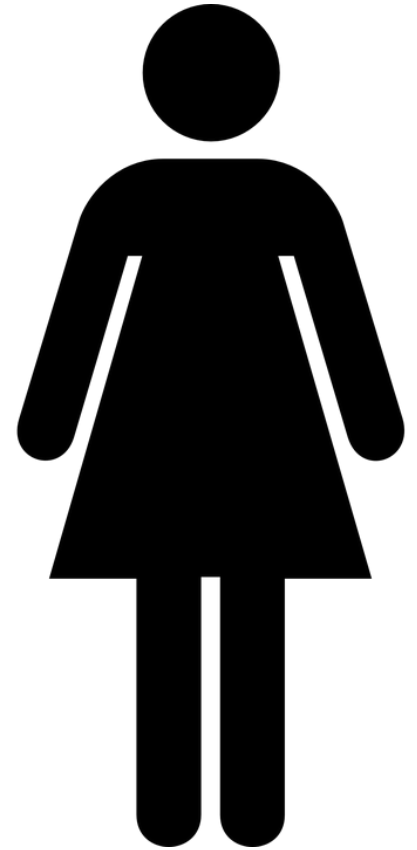
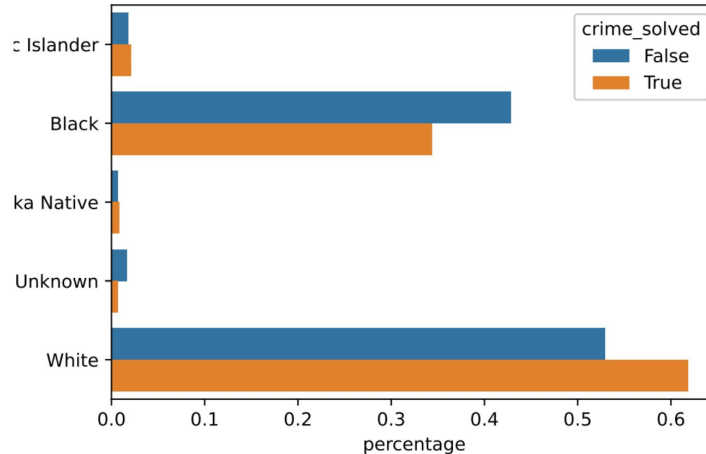
- Black Males are most at risk for having their cases go unsolved
 - Solved 65% of the time



Who are the Victims?

22% of all victims were Female

- Females are more likely to have their case solved
- Black females are 10% less likely to have their case solved when compared to other females.



Where do murders occur?

15.6% of homicides occur in California

9.7% in Texas

7.7% in New York

Solved

California	14.1%
Texas	10.5%
New York	5.9%

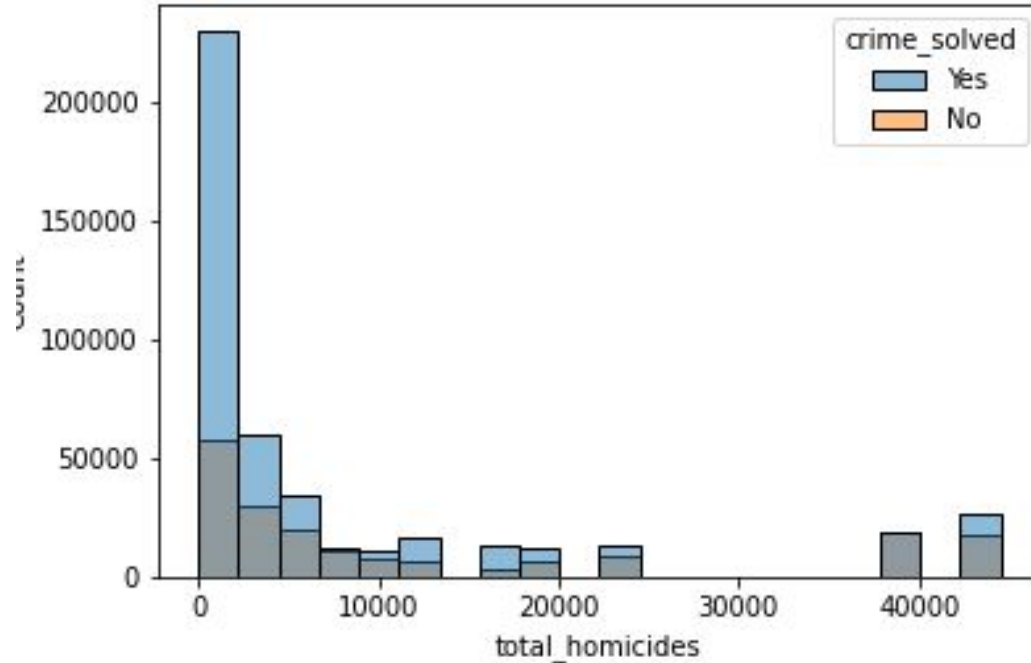
UnSolved

California	19.1%
New York	11.8%
Texas	7.7%

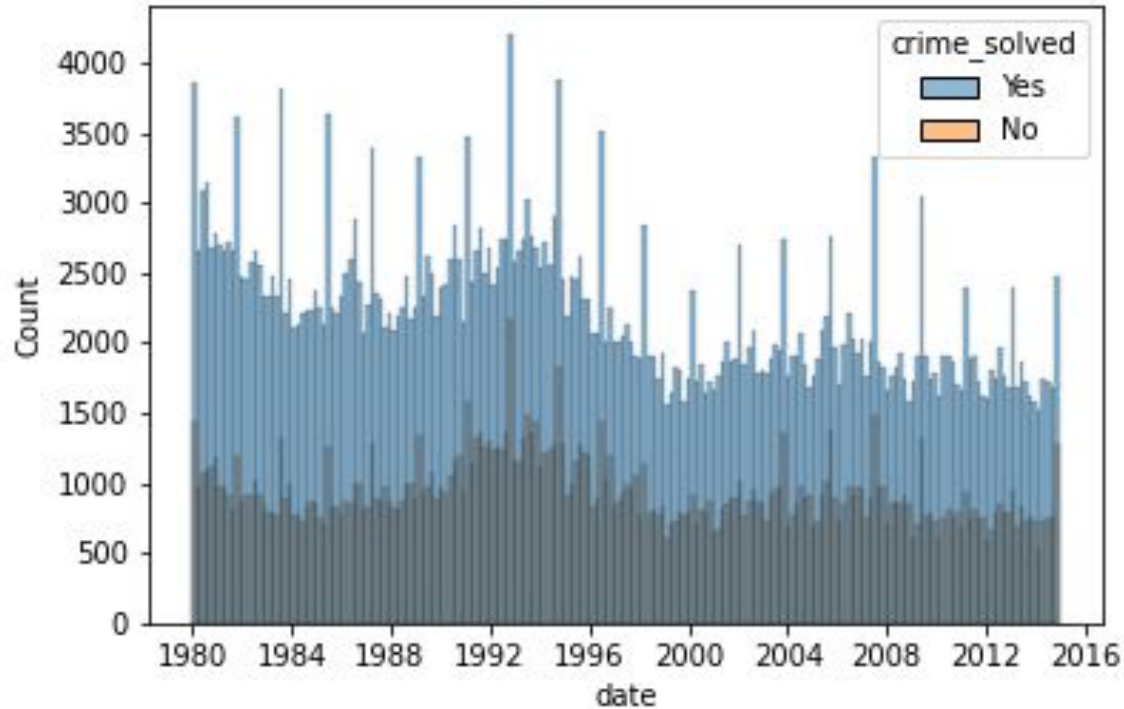
To gain insight about population we tried merging with a major city data base.
However 50% of the data was missing.

We created a new column `total_homicides` which contains the total number of homicides that occurred in a specific city

Total homicides in cities



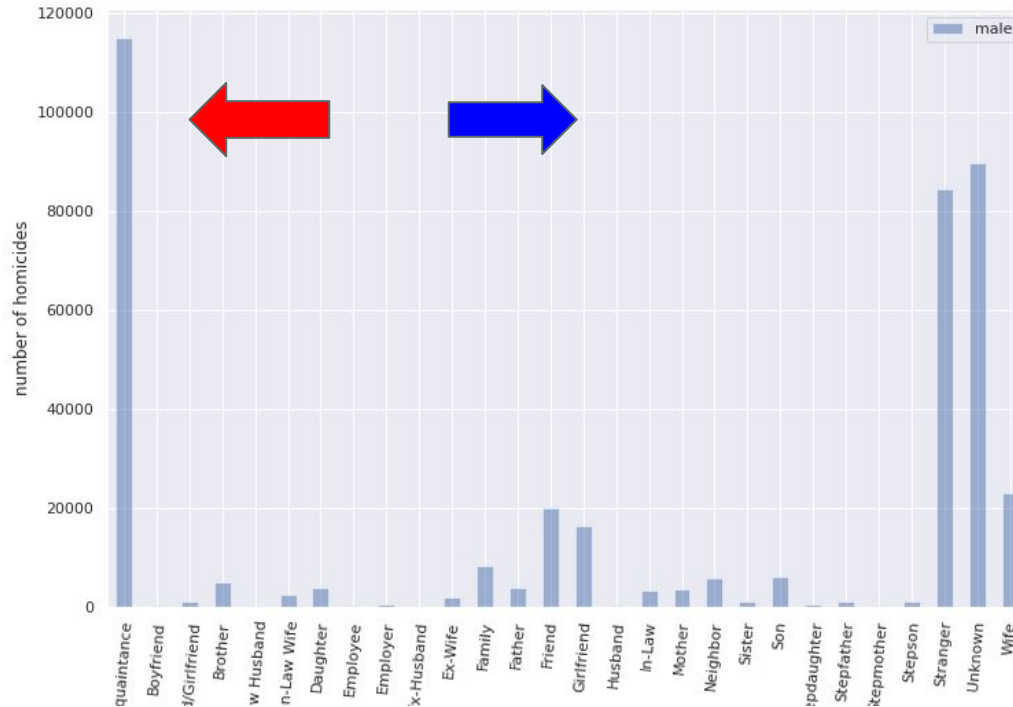
Trends over time



Comparisons

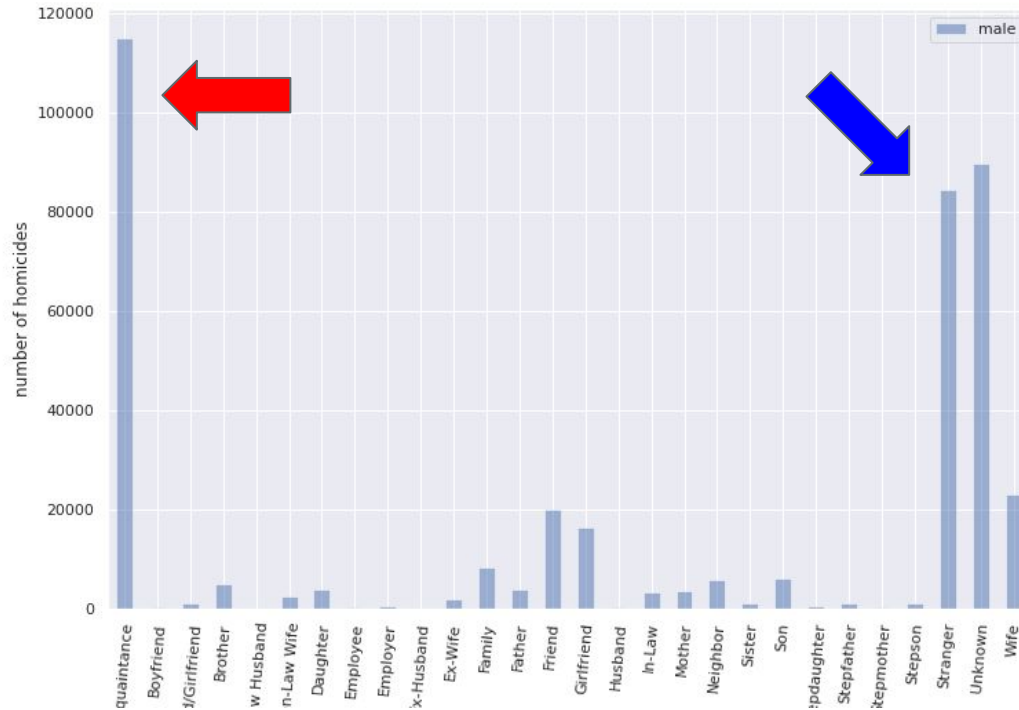
Perpetrator Sex Vs Relationships

Male Perp vs relationship

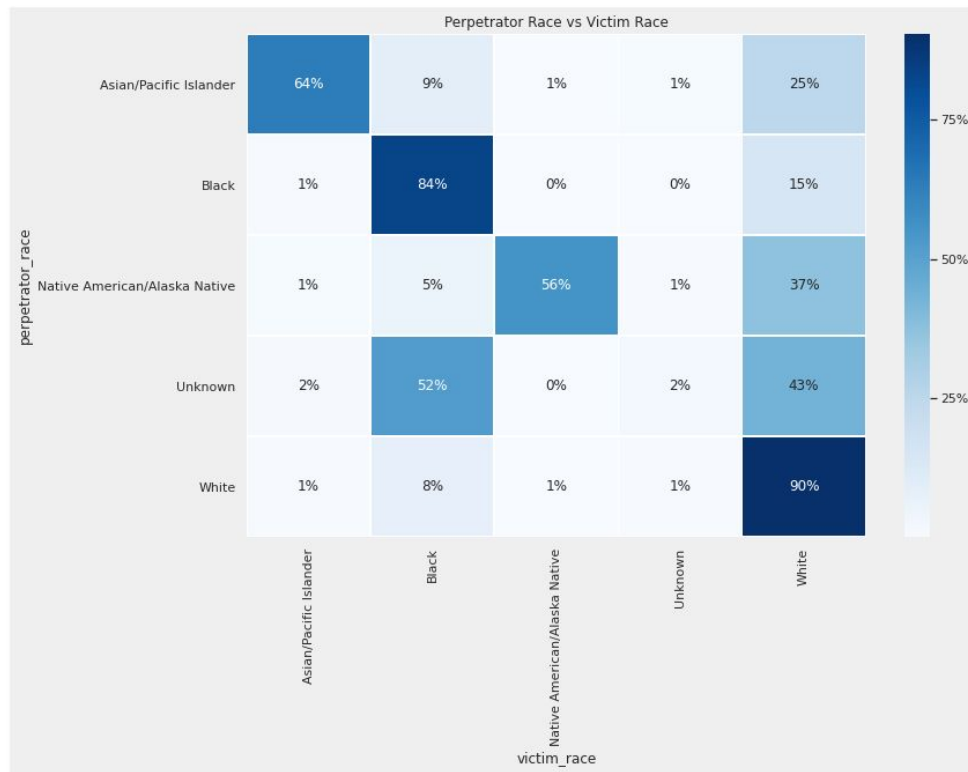


Perpetrator Sex Vs Relationships

Male Perp vs relationship



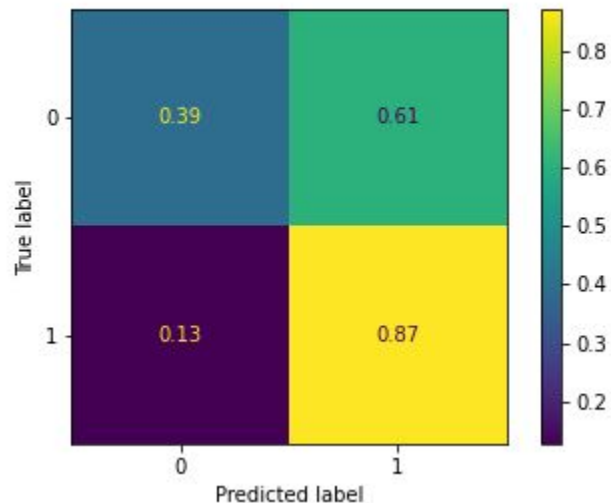
Perpetrator Race vs Victim Race



- Perpetrators tend to target victims of their own race

Predicting if a murder will
go unsolved

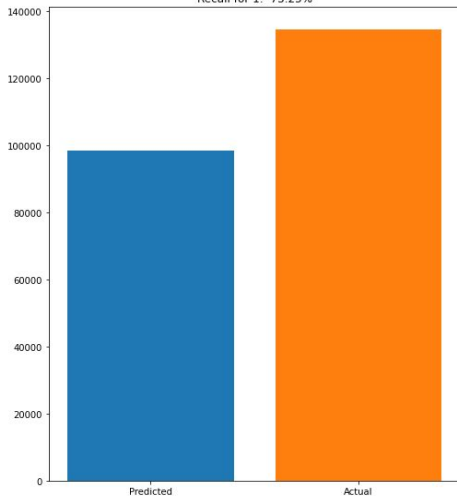
Decision Tree



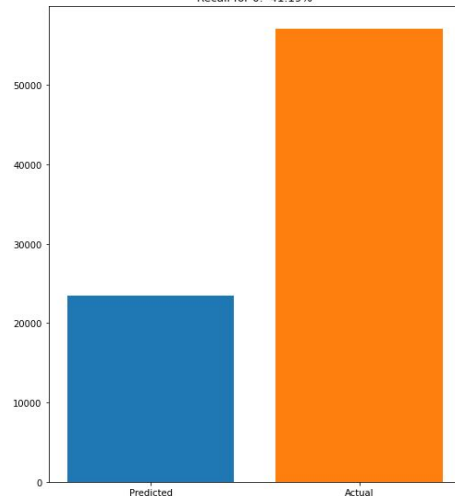
- This model is best at predicting cases that were solved
- The most important features
 - Total_homicides
 - Year
 - Victim_age
- Also sent columns for each weapon used

K-Nearest Neighbors

Recall for 1: 73.25%



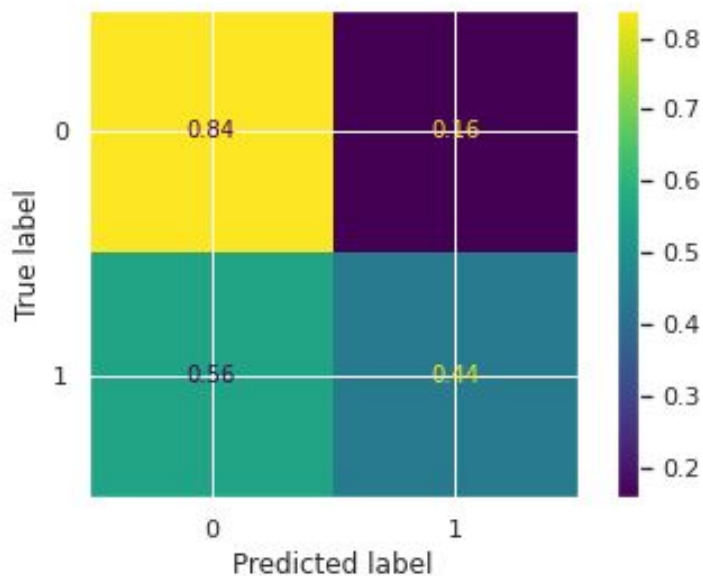
Recall for 0: 41.19%



Features:

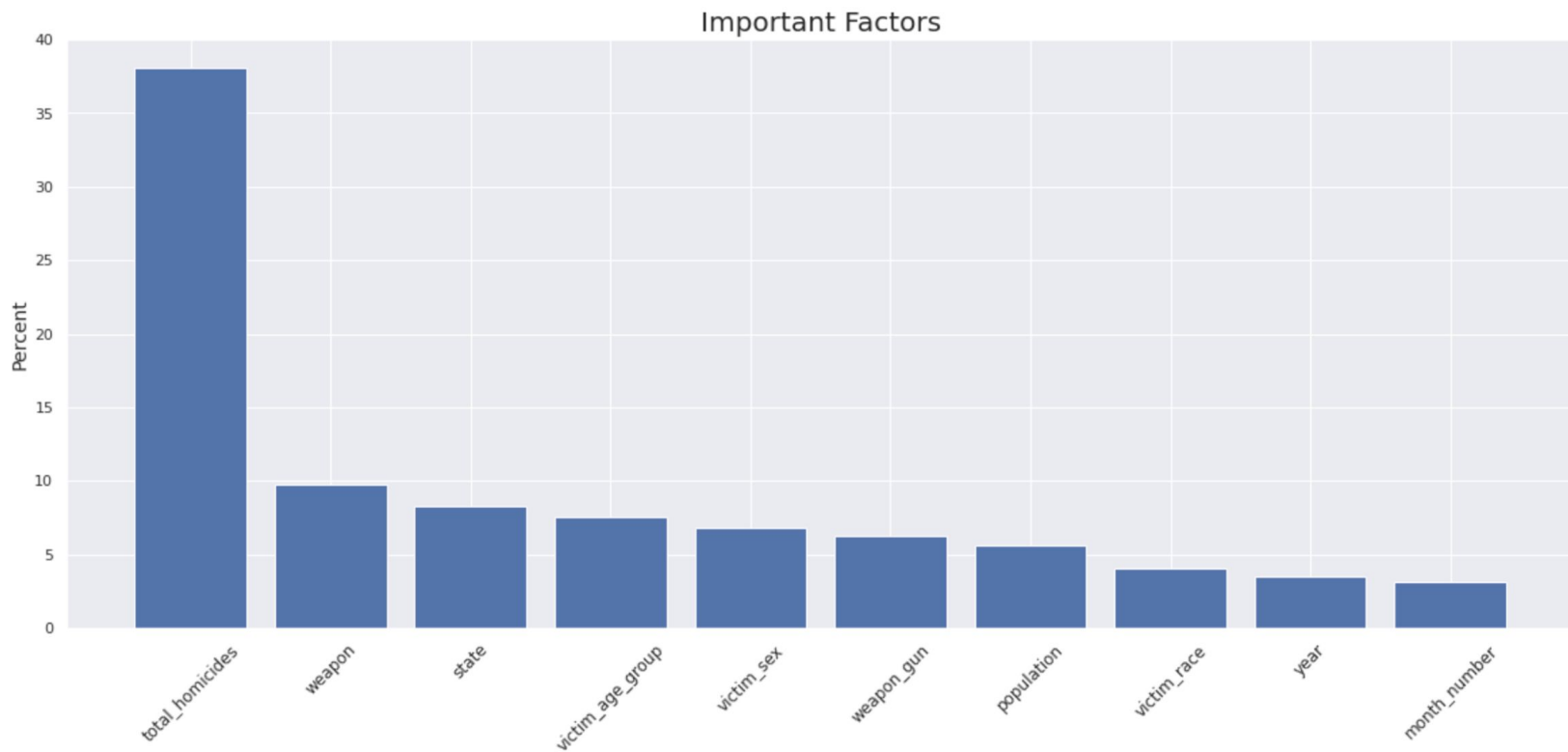
- Agency Type
- State
- Year
- Victim Sex
- Victim Age
- Victim race
- Weapon
- Month number

XG-Boost



- 72% accuracy
- Predicts the solved cases better

Important features



Outside Factors that cause noise in data

- Number of witnesses
- Lack of Motive
- Lack of Evidence

Conclusions

Cases at the largest risk of going unsolved

- Black males
- Victims in highly populated cities

We recommend allocating more resources and creating stronger programs to tackle these higher rates of cases going unsolved

The background features a dark, textured brushstroke that resembles charcoal or black paint, applied horizontally across the center of the image. This stroke is contained within a thin white rectangular border. The overall composition is set against a light gray background.

**Thank You For
Listening**