

Police Data on Terry Stops

Predicting outcomes of police encounters based on demographics, geography, and related metrics

By Seth Schober

Agenda

1. Objective & Approach
2. The Data
3. Exploratory Analysis
4. Modeling
5. Interpretation
6. Limitations and Next Steps
7. Conclusion

Objective & Approach

Goal

- Create a predictive model to determine whether a Terry stop will result in negative consequences on a subject's criminal record.

Methodology:

- Analyze police records about Terry stops
- Create predictive machine learning models
- Identify the most impactful/predictive features
- Explore further data trends

The Data

Source

- “Terry Stops” public safety dataset from the Seattle Police Department



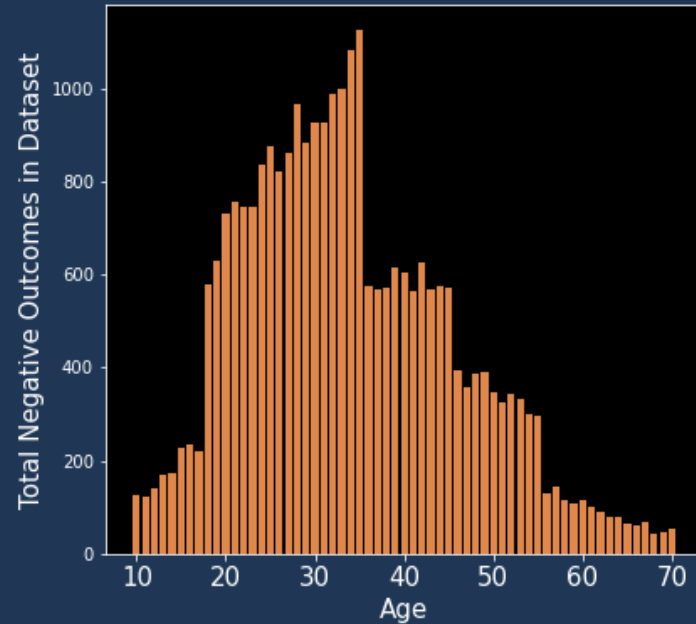
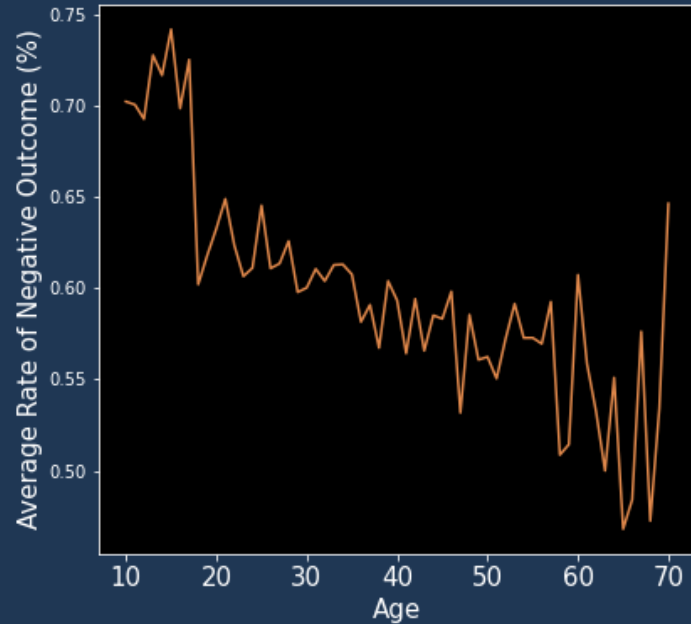
Seattle

Key Features

- Demographics: race, age, gender
- Situational: weapons involved, time/date
- Administrative: call type, precinct, officer squad
- Outcome: arrest, citation, field contact, offense report

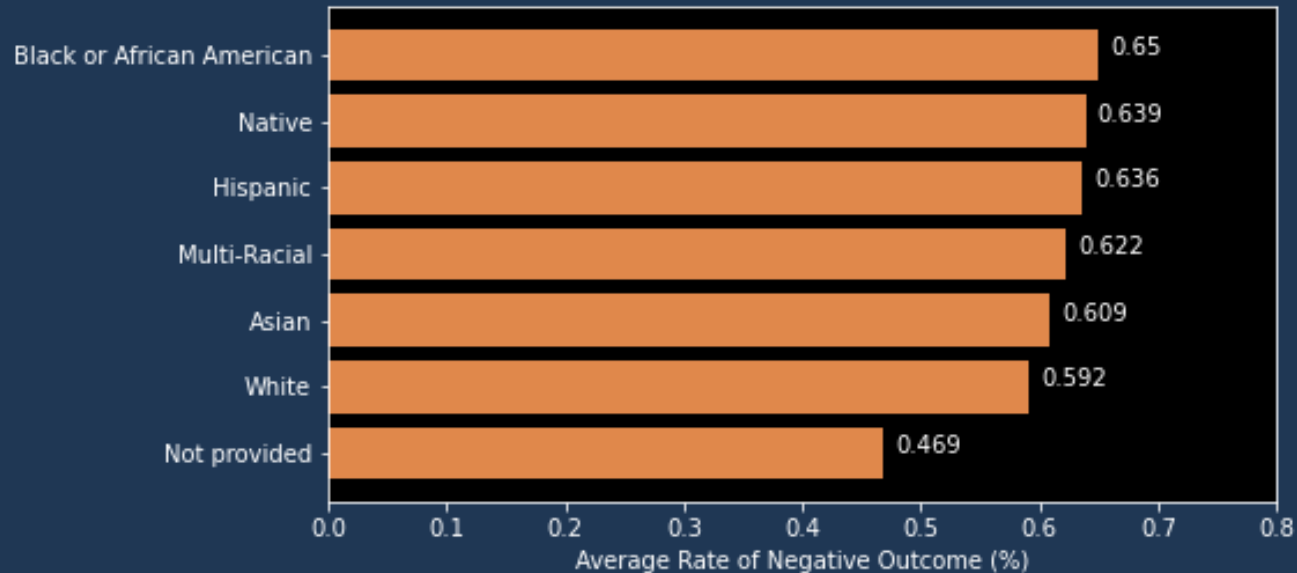
Exploratory Analysis: Subject Age

Relationship Between Subject Age and Negative Outcome



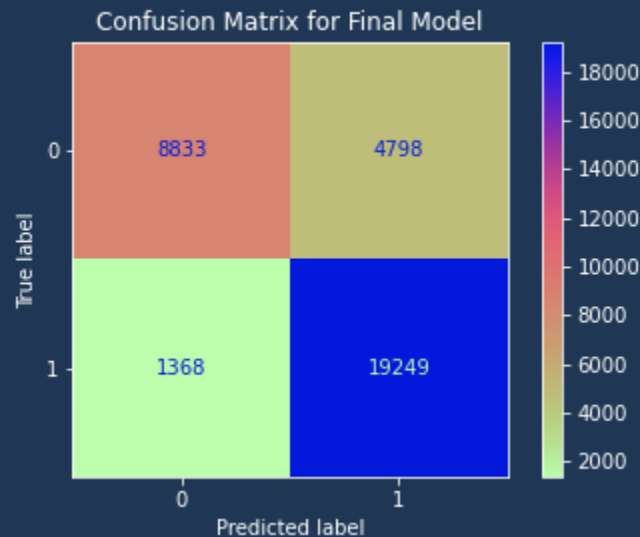
Exploratory Analysis: Subject Race

Negative Outcome Rate by Subject Race



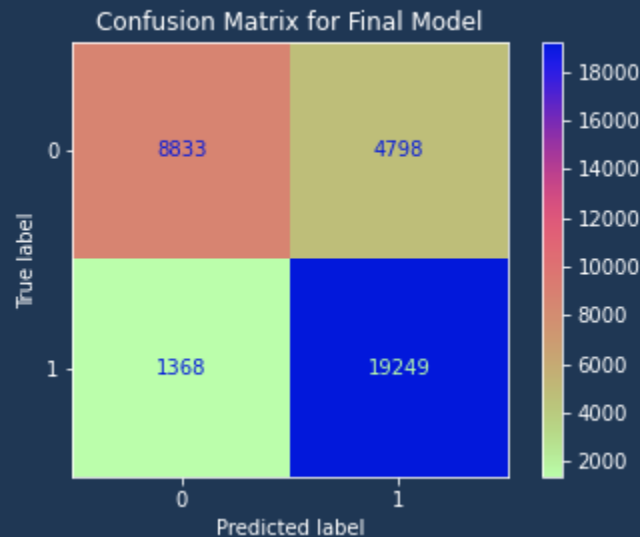
Modeling

- Dozens of models tested
- Final selection: Gradient Boosting (XG Boost)
- Accuracy: 79%
- F1 score: 84%

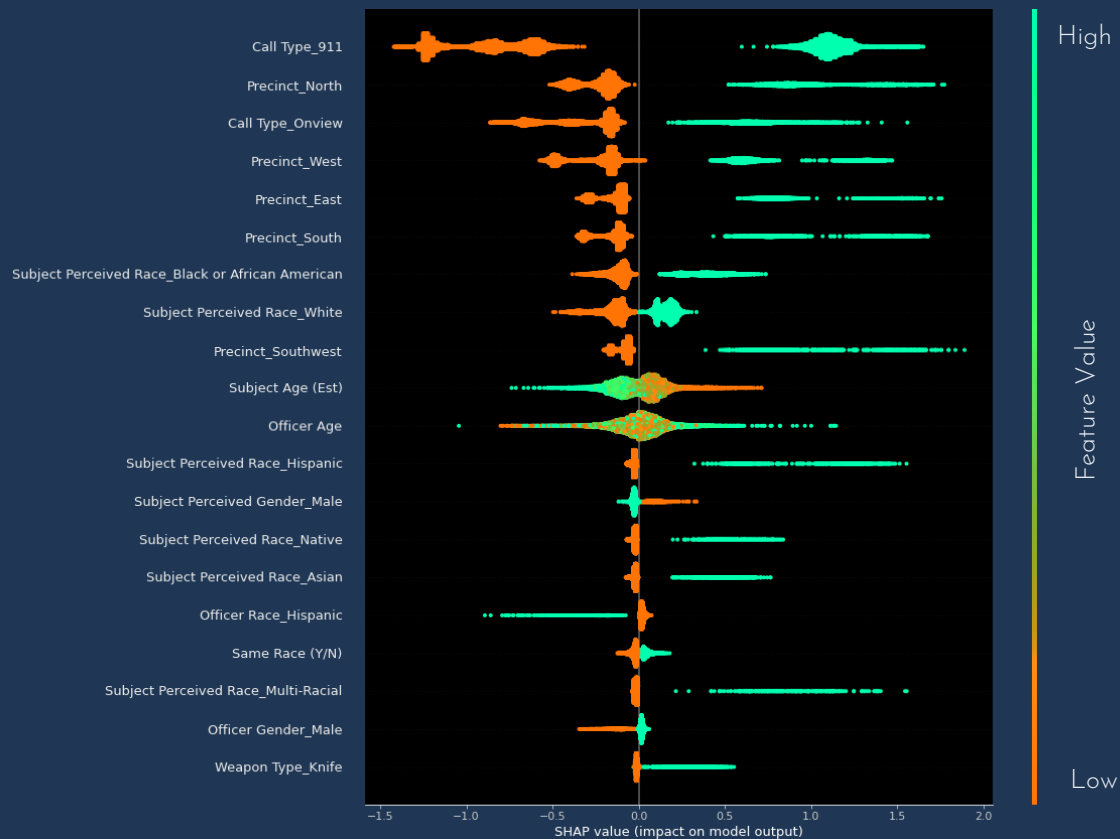


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Interpretation: SHAP Summary Plot



Limitations & Next Steps

Limitations

- Geographic and temporal scope
- Missing values
- Ambiguous metric for stop resolution

Next Steps

- Investigation of “call type” feature (reason why Terry stop occurred)
- Geographic scope expansion

Conclusion

The valuable predictors of a negative outcome for a Terry stop are:

- Origin of the call, such as a 911 or an on-view stop
- Police precinct where stop took place
- Subject perceived race

Take note that each of these factors is more impactful than other intuitive indicators of what might lead to a negative outcome, such as:

- Whether or not the subject has a weapon
- Officer gender
- Subject gender

Contact Information

