Arrest Flag Classifier

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Outline

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Business Overview

A Terry Stop is a brief detention or stop by law enforcement officers of an individual based on reasonable suspicion that the person has committed, is committing, or is about to commit a crime

Problem Statement: Predicting Arrest Flag in Law Enforcement Data

Problem Description:

The aim of this project is to develop a classification model that can predict the likelihood of an arrest flag being raised during law enforcement incidents. The dataset contains various attributes related to law enforcement incidents, such as location, time, officer details, and other relevant factors. The target variable, "Arrest Flag," indicates whether an arrest was made during the incident.

The goal is to build a predictive model that can accurately classify incidents as either resulting in an arrest or not. This model can be used by law enforcement agencies to identify high-risk incidents or allocate resources more effectively.

Problem Statement: Predicting Arrest Flag in Law Enforcement Data

Objective:

The objective is to build a classification model that can predict the likelihood of an arrest flag being raised during law enforcement incidents. The model should be able to accurately classify incidents as either resulting in an arrest or not, based on the available attributes in the dataset.

Evaluation:

The model will be evaluated based on its classification performance metrics, such as accuracy, precision, recall, and F1 score. The goal is to develop a model with high accuracy and balanced performance between the two classes (arrested vs. not arrested).

By successfully developing an accurate predictive model, law enforcement agencies can gain insights into the factors contributing to arrests and make informed decisions to enhance public safety and allocate resources efficiently.

Data Understanding

Data Collection

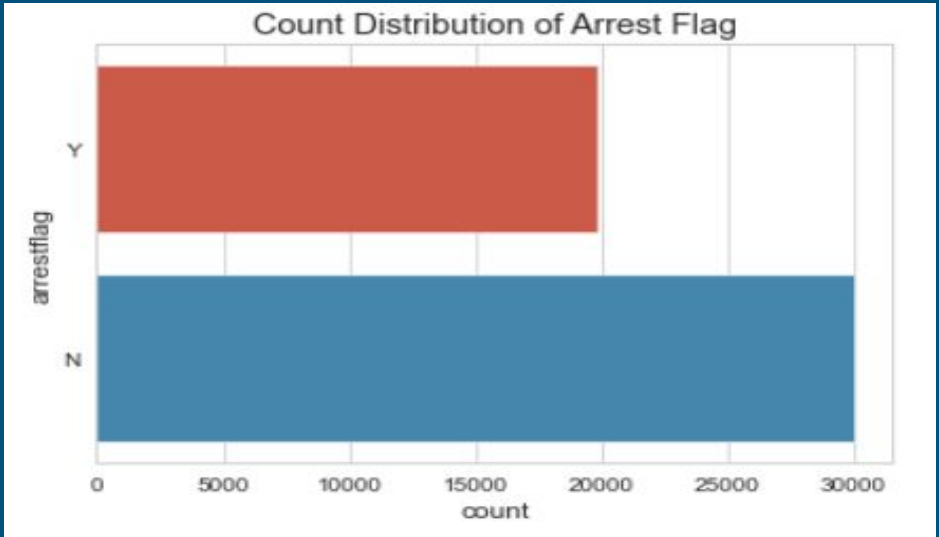
The source of this dataset is from Seattle Terry Traffic Stops dataset SPD_Terry Stops

There are 50000 rows and 23 columns

The data is from 2015- 2023 April

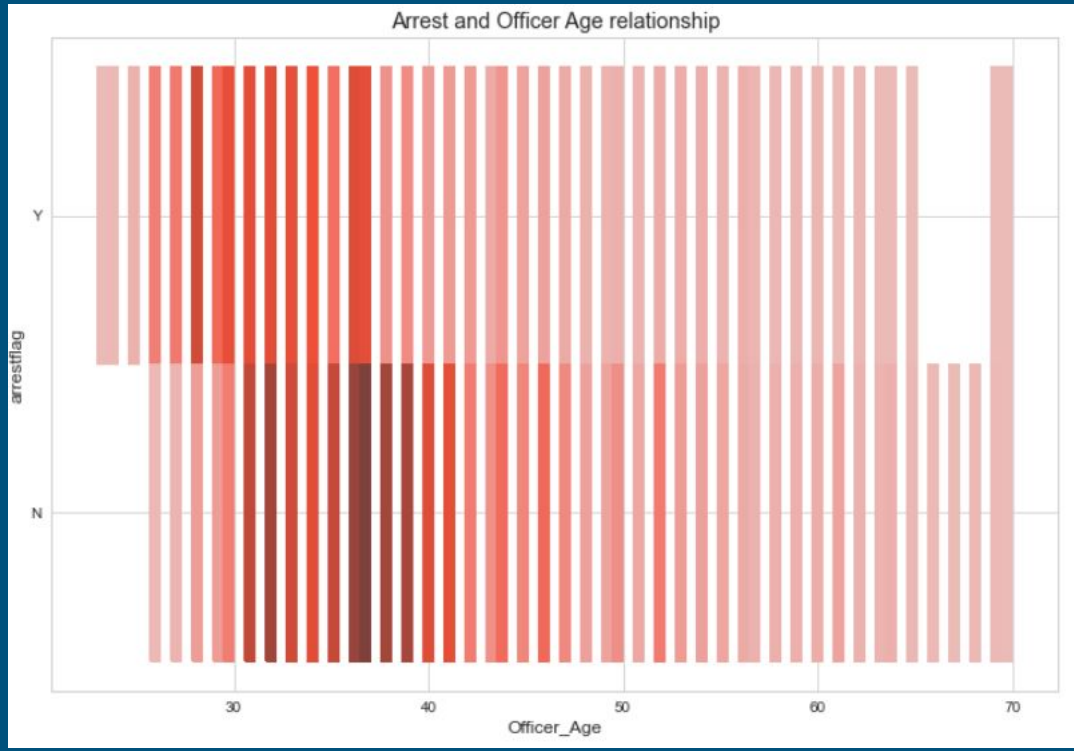
Target variable distr. Arrest Flag

Highest Arrest Flag are No

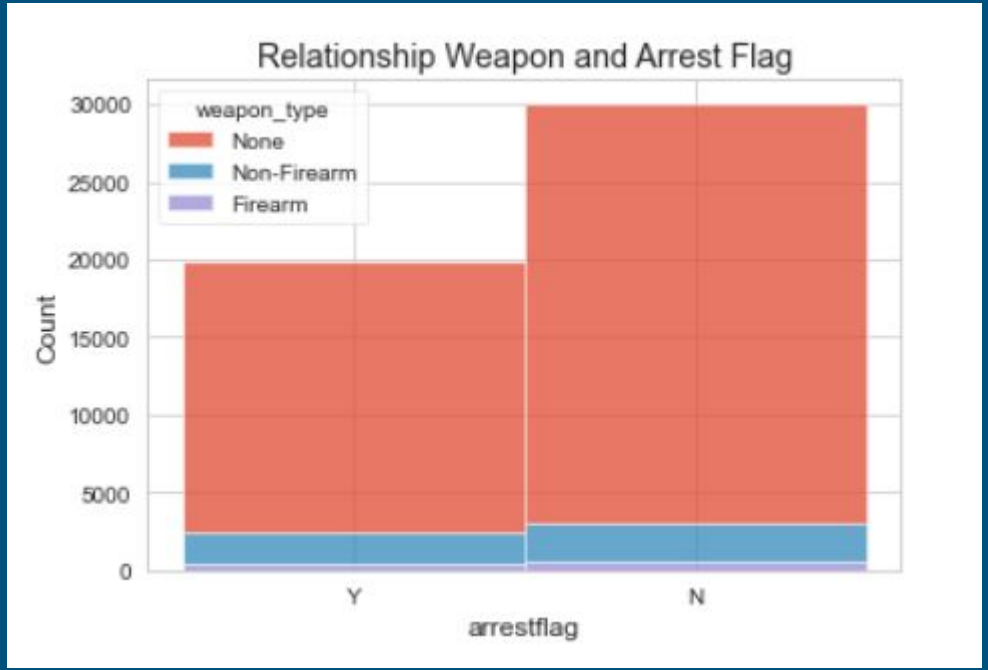


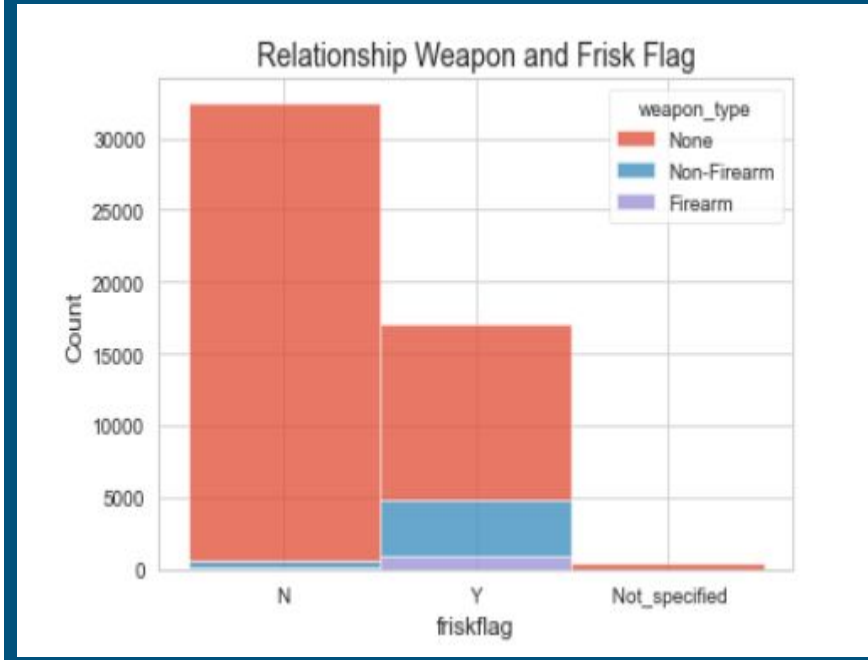
Findings 2:
Officer age and arrest flag relationship

Officers between the ages of 30 and 40 and they are making terry stops by the highest count



Finding 3:
What is the relationship between Weapon and Frisk , Arrest Flag



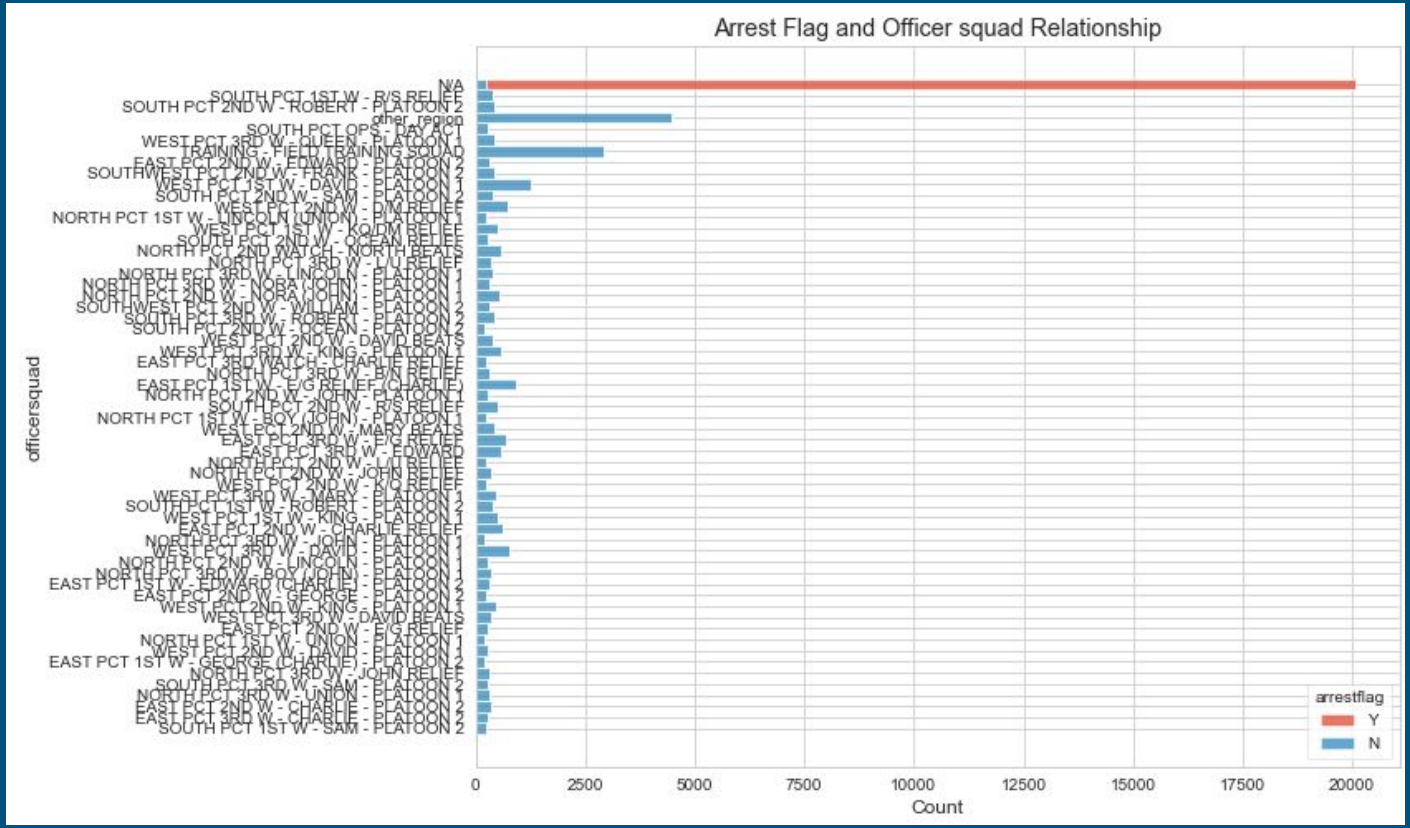


Point of interest during a terry highest count arrest flag have no weapon

Point of interest during a terry if you are frisked its most likely there was no firearm however non firearm are catching up

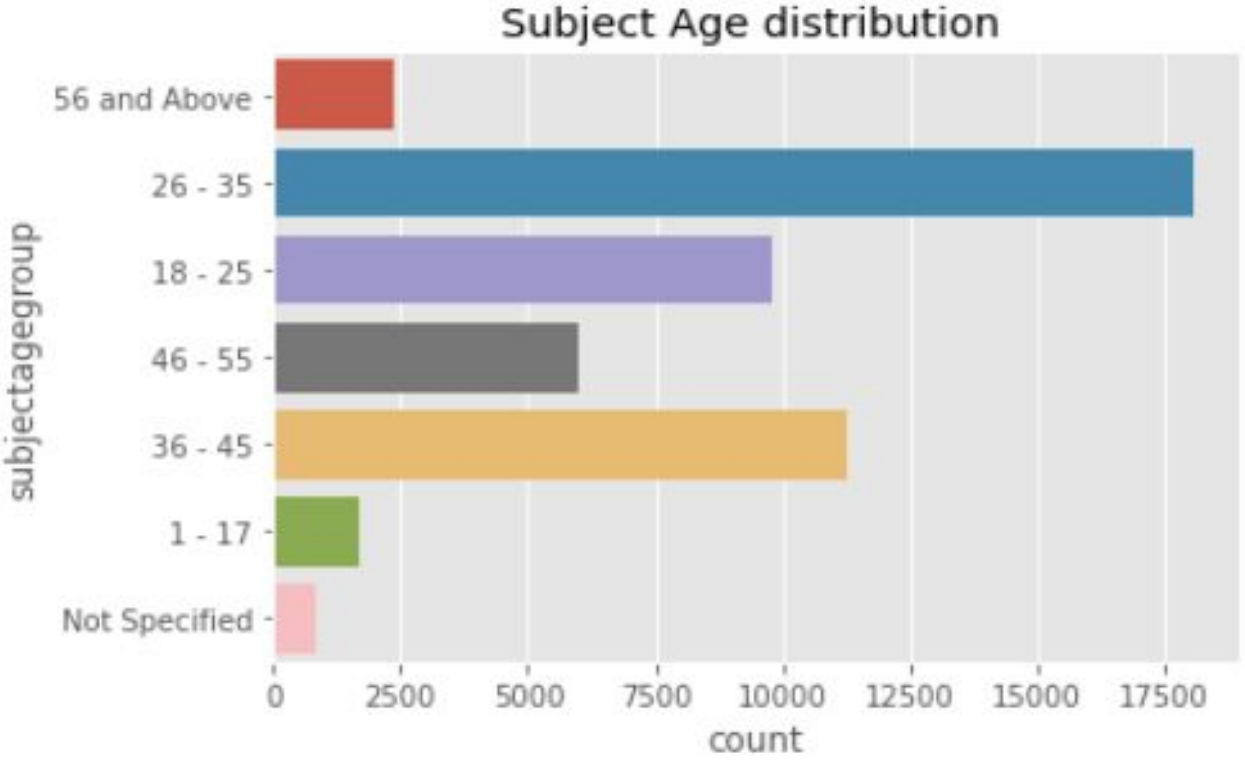
Findings 4:

N/A identified squads have the highest counts



Findings 4 :

Subject Age distribution

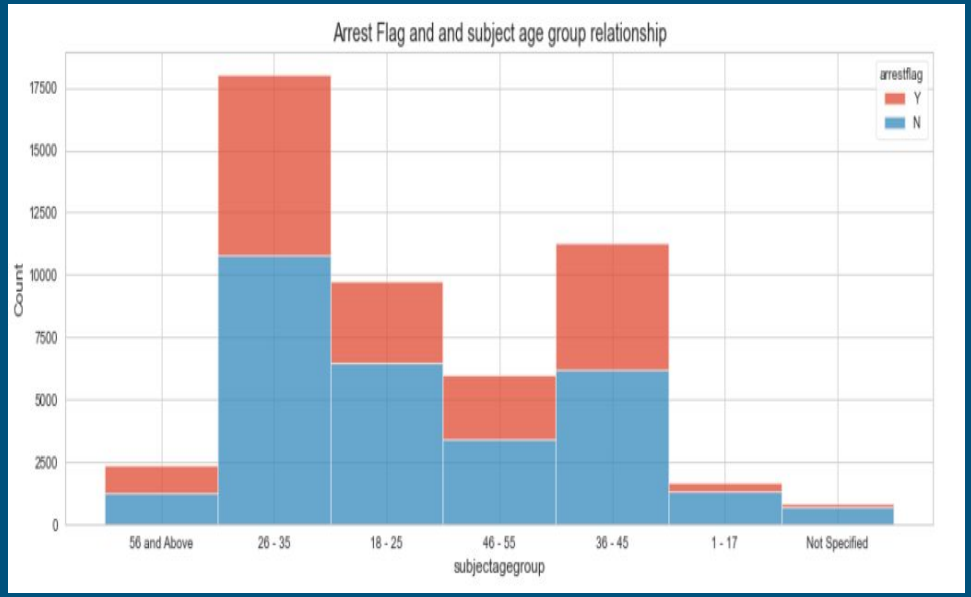


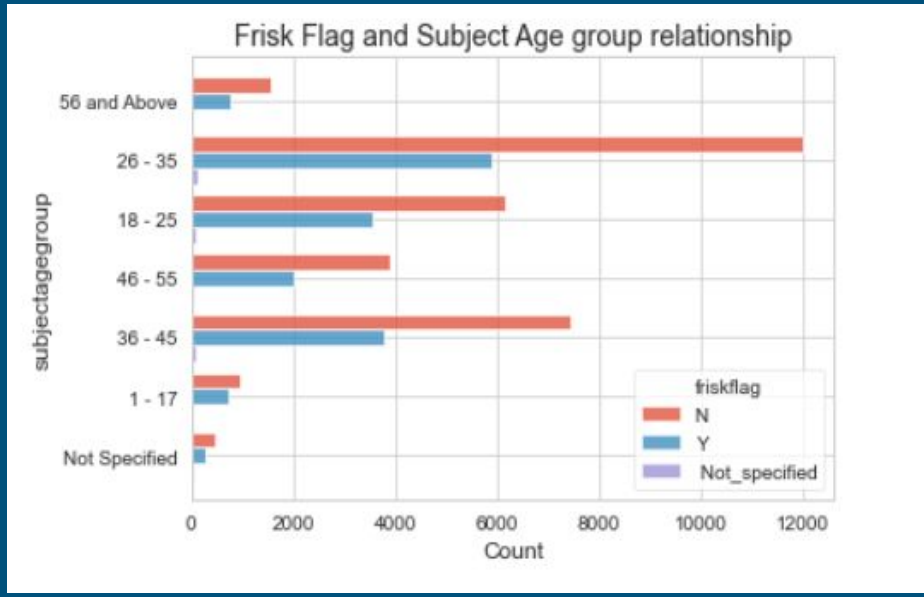
Highest count number are ages between 26 and 35 an 36 and 45

Finding 5
Subject Age and frisk and Arrest Flag

Ages 26-35 have the highest arrest flag arrest flag but 36-45

Ages 26-35 have the highest count of No of frisk done

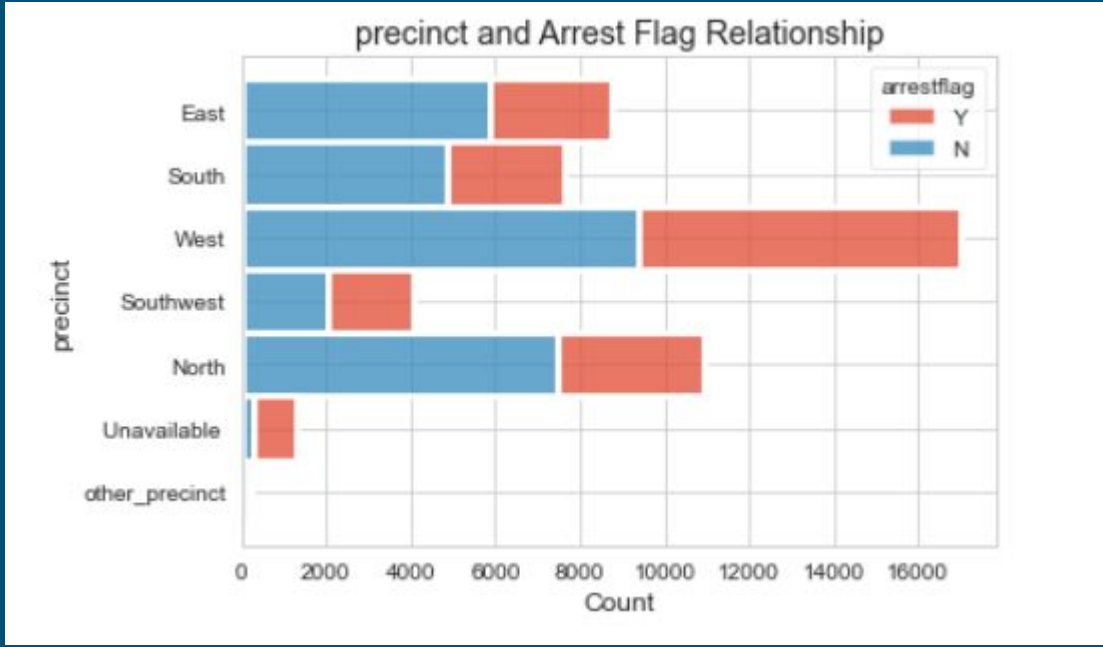




Finding 6:

West has the highest count of responses

And west is leading with the none type being highest



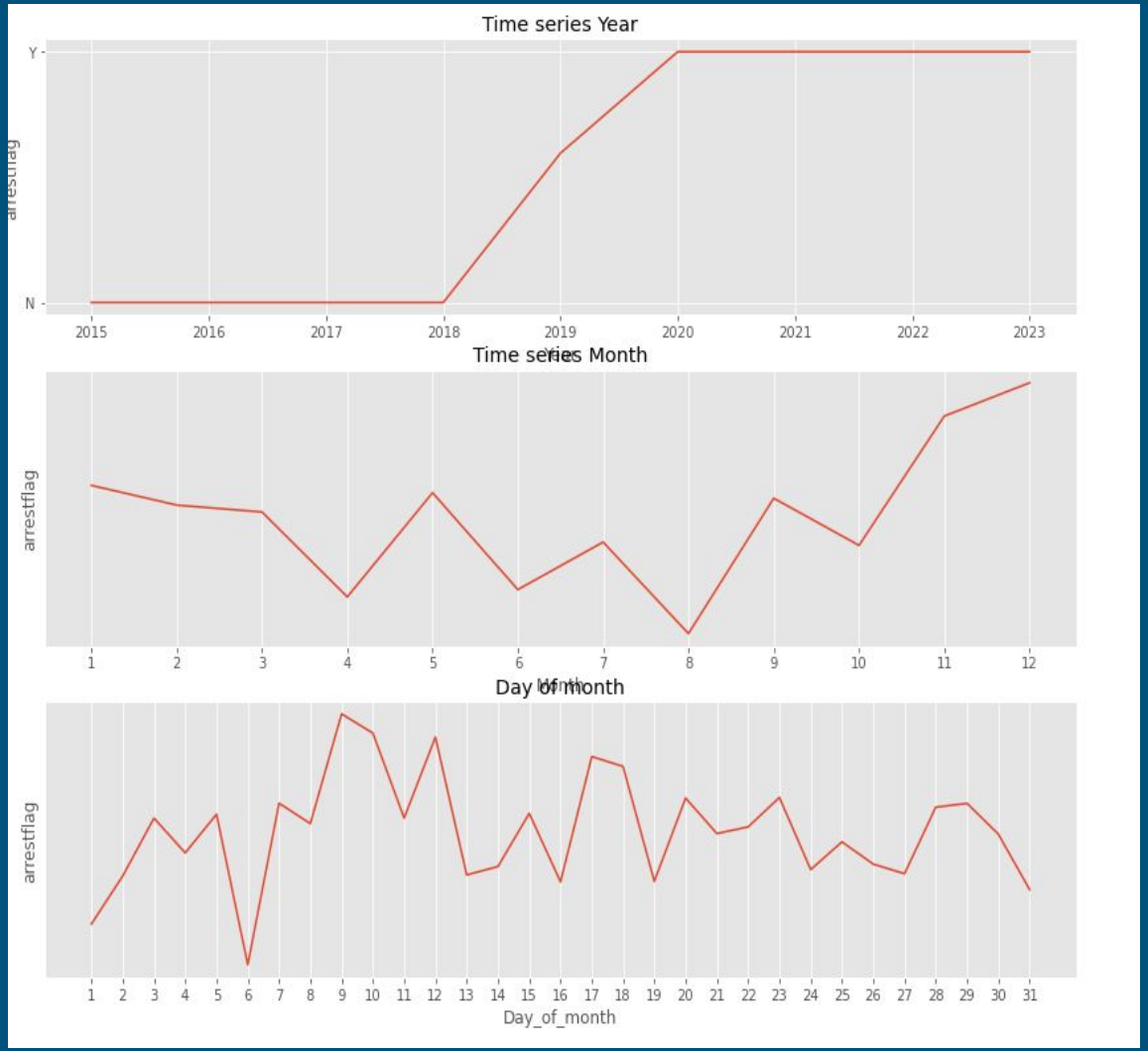
Finding 7:

Time series

Highest Arrest report was in 2018 and then its constant

Fourth seasonal trends month from 8th month there is a spike

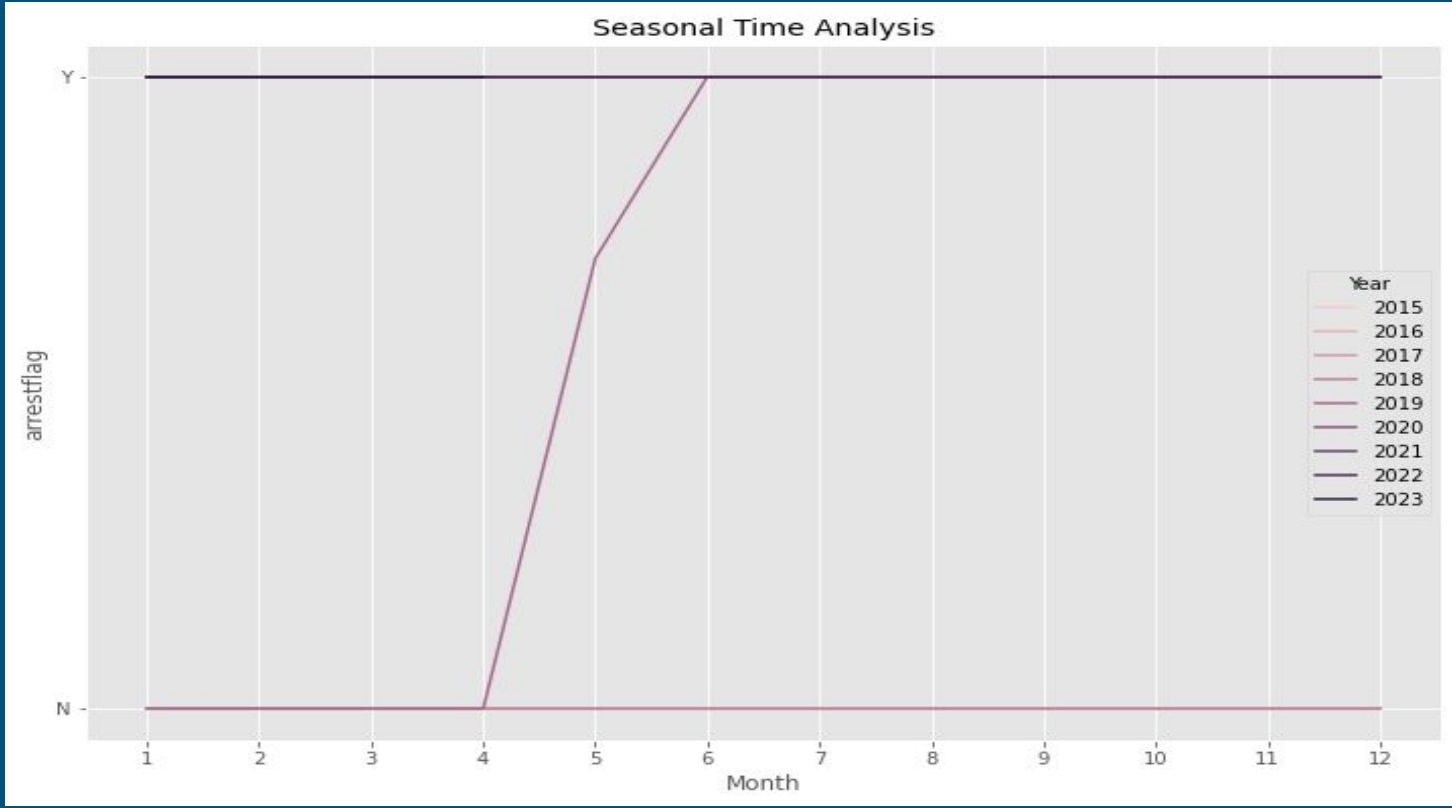
9th day of the month is where we see a high record of arrest flag counts and 6th is when we have the least



Finding 7 :

Seasonal Trends

So 4 months in the 2023 year and the count is very high compared to the general totals of previous years

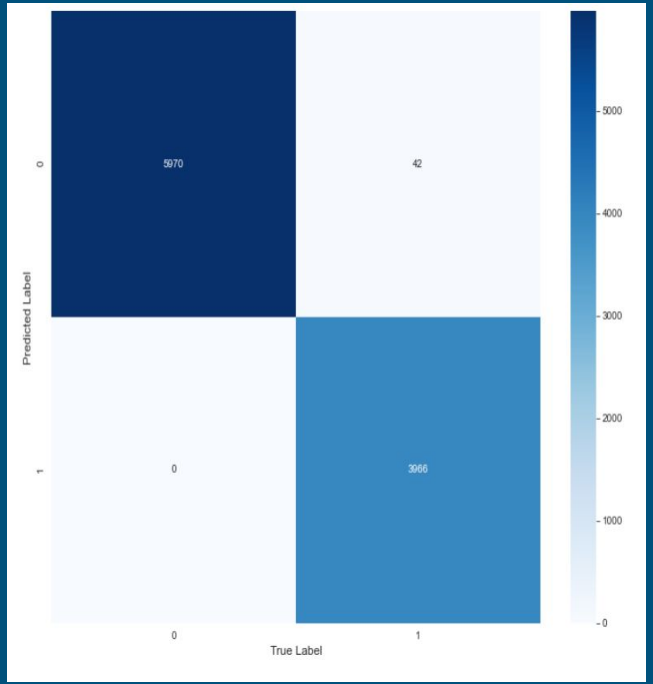


Evaluation Results

Findings

Based on the confusion matrix provided, the model seems to have performed well. It correctly predicted a high number of true negatives and true positives, indicating that it has a good ability to distinguish between instances that result in an arrest and those that do not.

Visuals



Recommendation

1. Focus on high-impact factors: Identify the most influential features in the models that contribute significantly to predicting arrests during Terry stops. Allocate resources and training efforts towards addressing these factors and improving outcomes.
2. Improve data collection: Ensure accurate and comprehensive data collection during Terry stops. This includes capturing all relevant information such as officer squad, precinct, subject demographics, and other pertinent details. Improving data collection practices can enhance the quality of analysis and modeling, leading to more accurate predictions.
3. Implement targeted training programs: Use the information from the models to develop targeted training programs for officers. Focus on areas where the models indicate a higher likelihood of arrests, such as specific precincts or officer squads. Provide training on effective communication, de-escalation techniques, and bias awareness to minimize the occurrence of arrests during Terry stops.
4. Monitor and evaluate outcomes: Continuously monitor the outcomes of Terry stops, including the number of arrests made and the effectiveness of interventions. Regularly assess the performance of the models and update them as needed. Track key performance indicators and evaluate the impact of implemented measures on arrest rates and overall outcomes.

Next Steps

1. Conduct further analysis: Consider conducting additional analyses to gain deeper insights into the problem. This could involve exploring different variables, conducting subgroup analyses, or using advanced modeling techniques. Continuously strive to enhance your understanding of the factors influencing arrests during Terry stops.
2. Iterate and adapt: Treat your analysis and recommendations as an iterative process. As you gather more data, receive feedback, and assess the impact of your actions, be prepared to iterate and adapt your strategies accordingly. Continuously learn from your experiences and adjust your approach as needed

THANK YOU

This is a project under progress feel free to reach out incase you have insights on the project or have a question

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