Terry Stops:

A Classification Project by Terry Thompson

Overview:

A ***Terry* stop** in the United States allows the police to briefly detain a person based on reasonable suspicion of involvement in criminal activity. Reasonable suspicion is a lower standard than probable cause which is needed for arrest. While the Supreme Court has defined the intersection between policing and Fourth Amendment Rights, Congress has not defined a baseline for police behavior. Due to this lack of definition, there is concern that Terry stops do not take into account possible bias' of officers. There is also concern of policing policies that abuse this tool.

In this report, we will look at the effectiveness of these stops, as well as predict whether or not a Terry stop resulted in arrest or not.

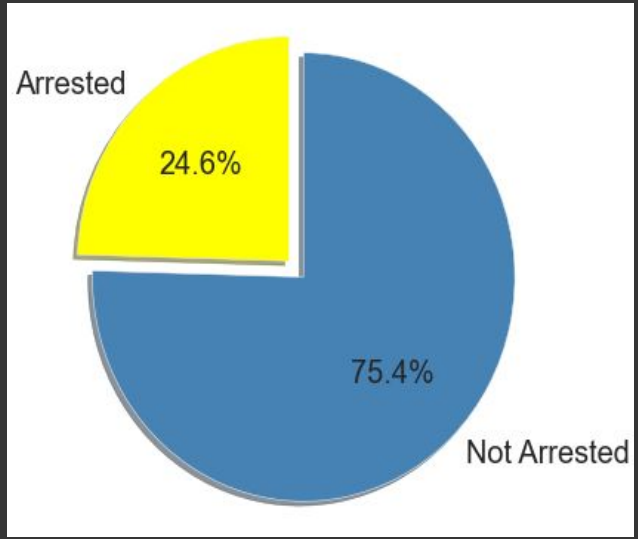
1. Intro

For this project I used the Seattle Open Data websites information on Terry stops (https://data.seattle.gov/Public-Safety/Terry-Stops/28ny-9ts8). This data set includes many categories detailing the stops.

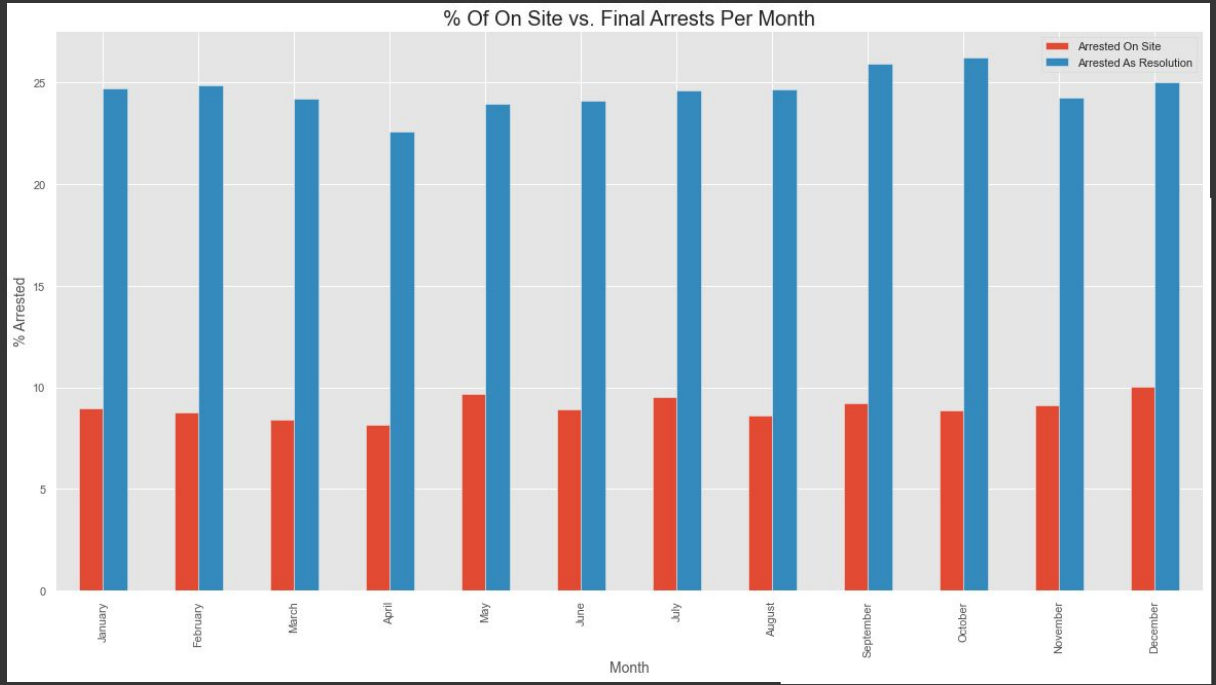
My steps included cleaning the data, exploring, and modeling the data to make conclusions.

We will now look at this process.

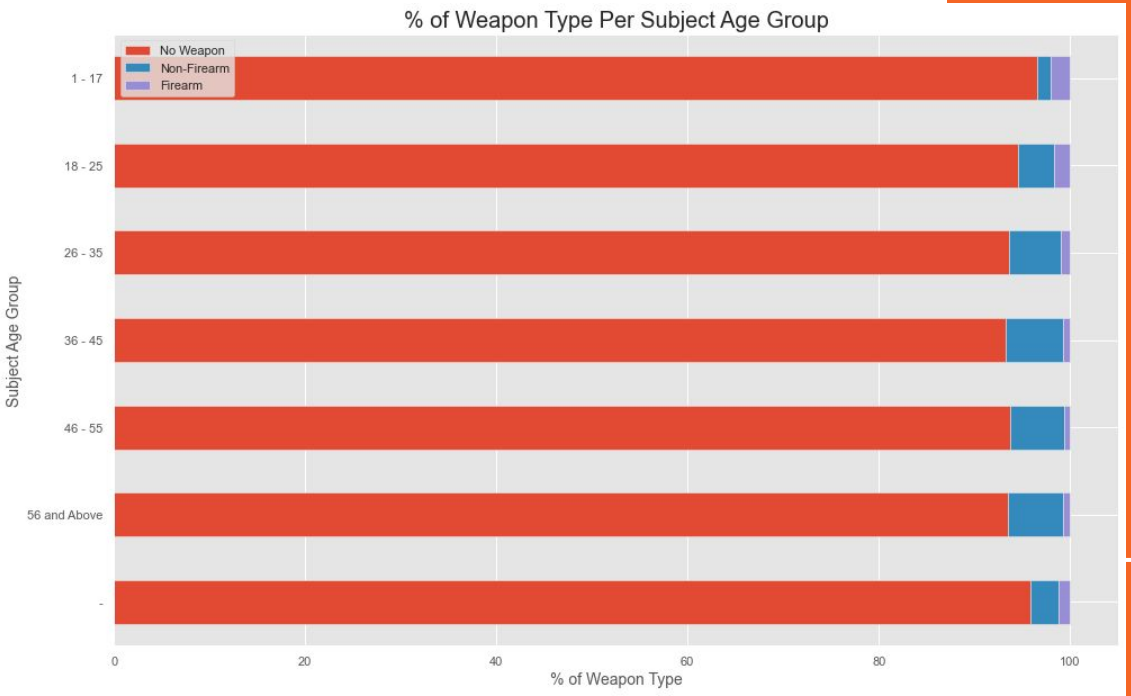
Here we see a diagram representing the percentage of subjects that were arrested and not arrested. At the surface, it looks like 24.6% of the people were arrested, which would give some credulity to the validity of the Terry stop. However, these numbers represent the amount of arrests made as a result of Terry stops. In the next slide we will look at the amount of arrests made at the scene of the Terry stop.



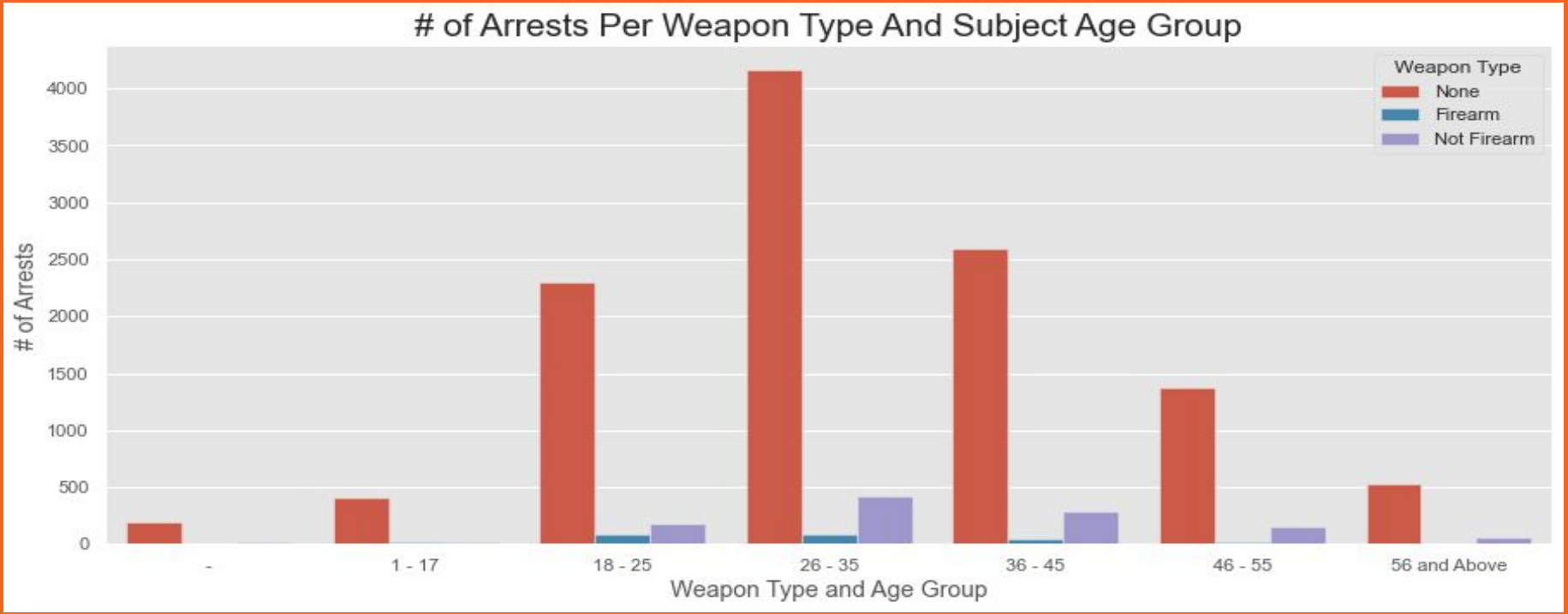
After delving into the information more, we can see that approximately 9% of the stops actually end up in arrest at the scene of the stop.



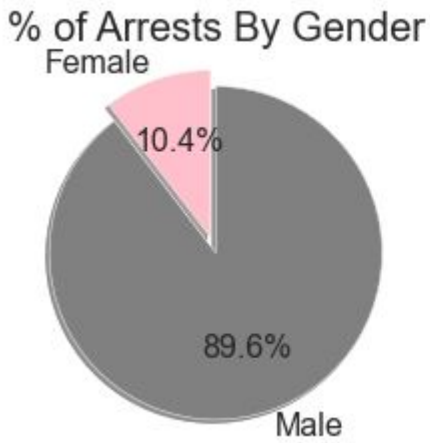
Here we see the percentages of weapon types per subject age group. This graph represents age groups of people who were stopped and what kind of weapons found. The red indicates no weapons were found, the blue indicates non-firearms, and the purple indicates firearms. In this breakdown, we see that the age groups of 26-35 and 36-45 had the most weapons found. While weapons were found in all categories, approximately 90% of the stops did not yield weapons.

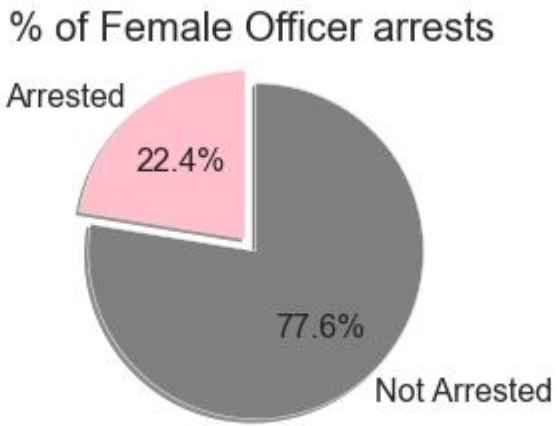


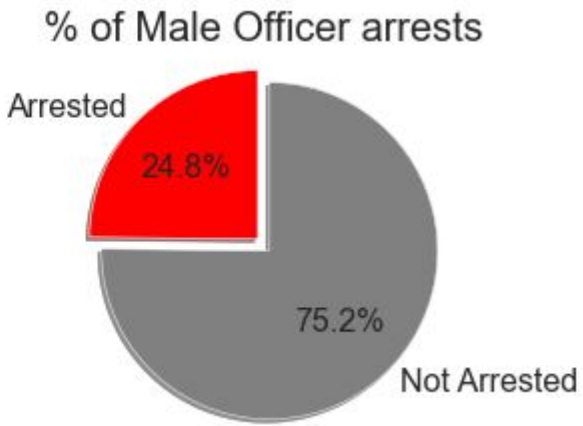
Here we see a clear breakdown of the age groups in which subjects were arrested and whether or not they had weapons. The age group of 26-35 has considerably more arrests, both with and without weapons.



Here we can see the percentage of arrests by officer gender. The percentage of males arrested compared to the percentage of females arrested is significantly higher. We can also see that the percentage of arrests by both male and female officers are pretty close.



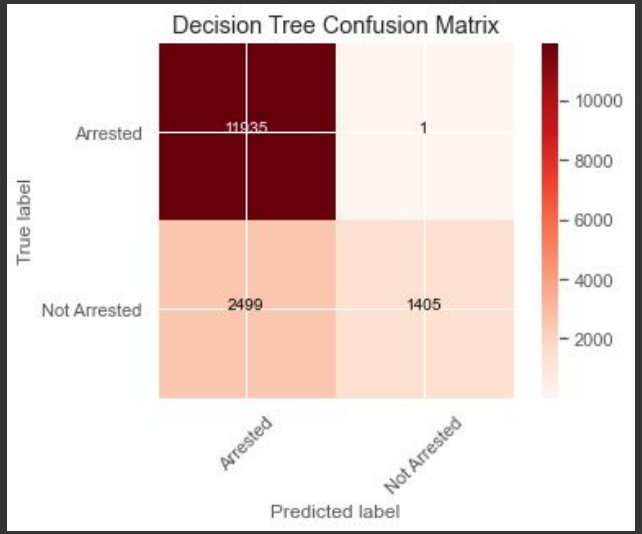


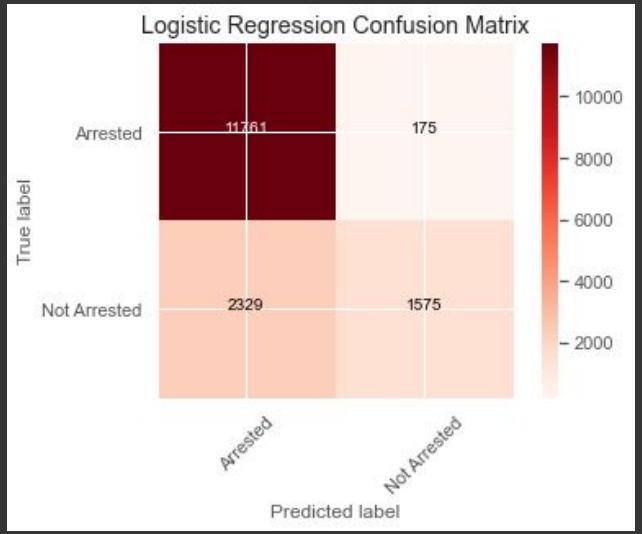


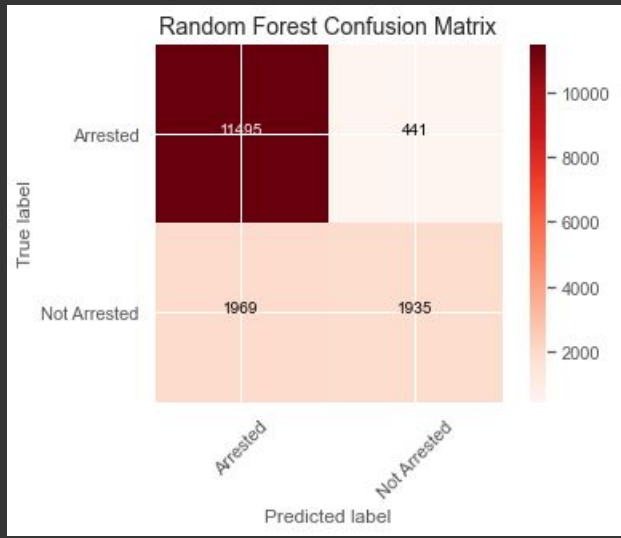
Here we see a chart showing the different precincts and the percentages of subjects arrested and not arrested. The largest amount of stops occurred in the West precinct, while the highest percentage of arrests occurred in the East precinct. It is interesting to note that the Unknown precinct had a high stop rate, but yielded the lowest arrest rate.

	# of Terry Stops	% Arrested	% Not Arrested
West	13690	32.300950	67.699050
North	11528	25.069396	74.930604
-	10196	3.177717	96.822283
East	6824	33.118406	66.881594
South	6255	31.638689	68.361311
Southwest	2320	23.836207	76.163793
SouthWest	1704	28.051643	71.948357
Unknown	200	25.500000	74.500000
OOJ	59	8.474576	91.525424
FK ERROR	22	18.181818	81.818182

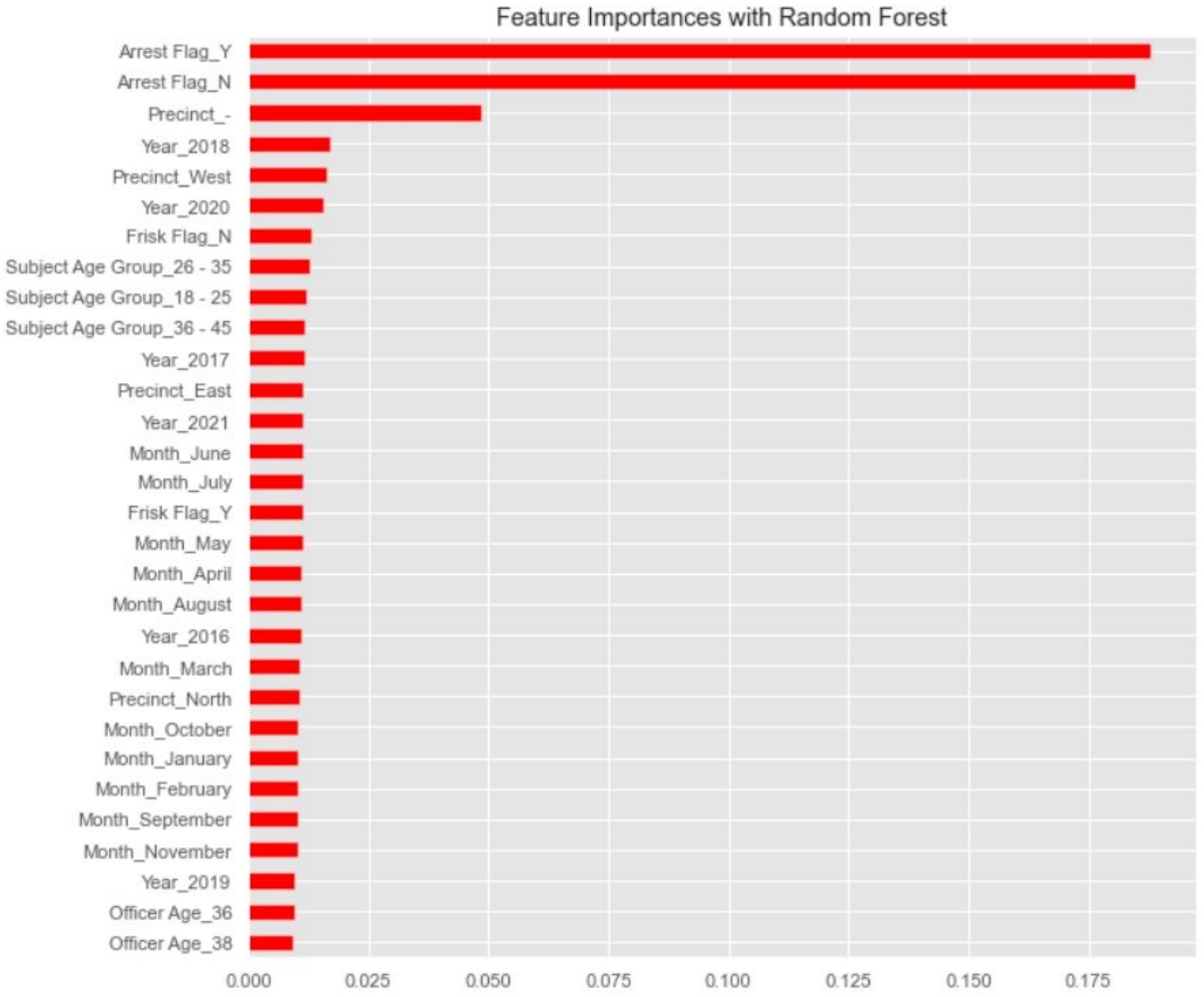
Below are confusion matrices. While we had more false positives occur in the Random Forest matrix, we also had less false negatives. The Random Forest matrix was the most accurate, being able to predict arrests with an 84.78% accuracy.







We can see that the most important features in the Random Forest model include the Arrest Flag “Yes”, Arrest Flag “No”, and the Unknown Precinct.



Conclusions:

In conclusion, the most accurate model predicts arrest 84.78% of the time. To make the model more accurate, I recommend the following:

- Train police officers to fill out all portions of the paperwork accurately. With accurate reporting, ambiguity in the data would be reduced, leading to more accurate information, which will not only make the prediction model more effective, but would also give more information regarding the effectiveness of the Terry stop.

Given the data present at this time, it is my recommendation that police officers be trained on when a Terry stop would be appropriate. At the surface, it looks like the stops are somewhat effective, given that almost 25% of the stops result in arrest. However, only 9% of the stops result in arrest at the time of the stop. If the Terry stop is being touted as a way to get weapons off of the street, the results show underwhelming results, with the majority of the stops not yielding weapons, and of the weapons found, firearms make only a very small percentage of the weapons found.

Further research :

While the model can predict with an approximate 85% success rate, further research is needed on this subject. Potential topics for research could include:

- Crime rates in each precinct. Is there a correlation between the amount of Terry stops and crime within a precinct area?
- Racial bias. Is there a correlation between officer race and subject race?
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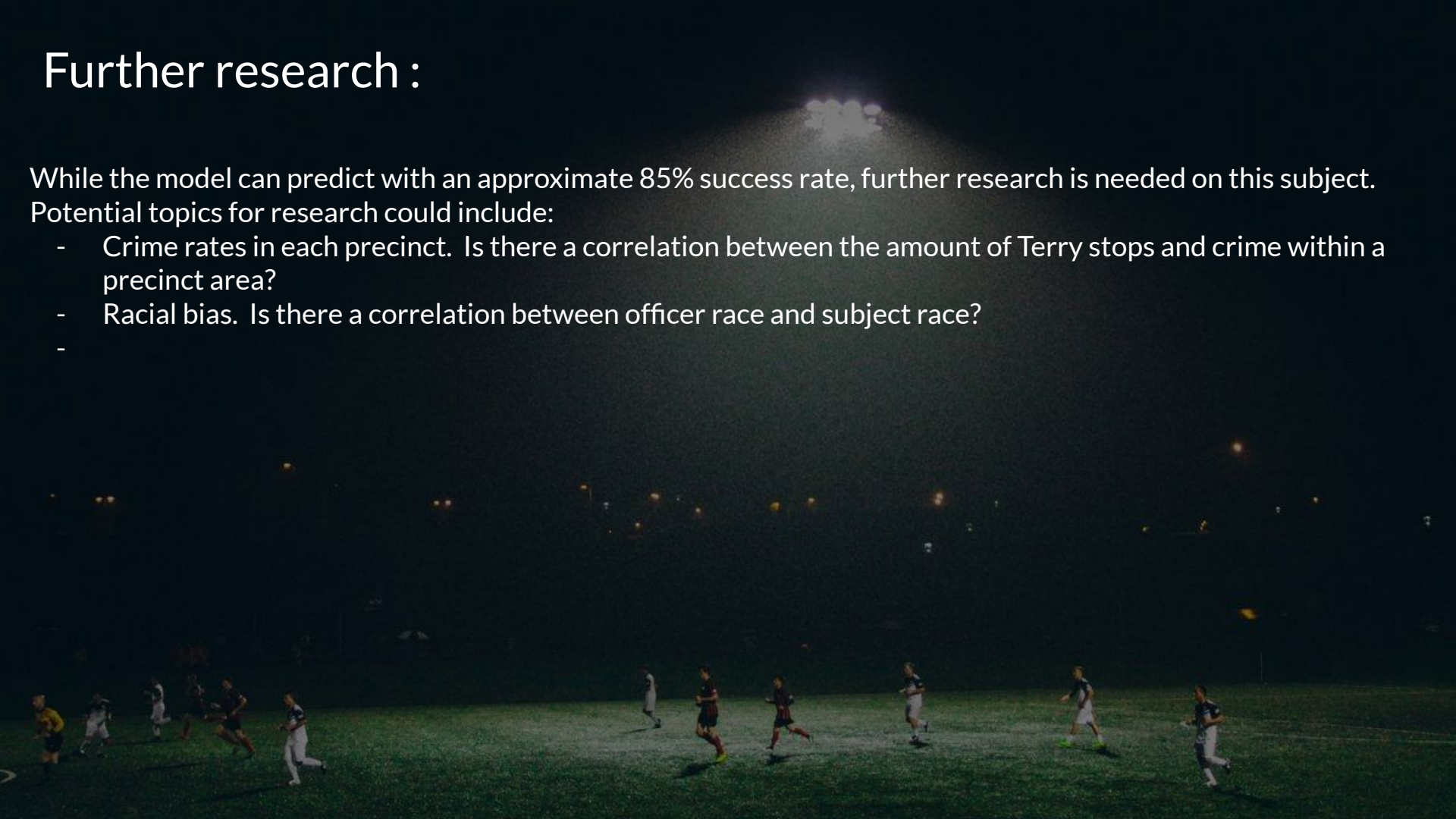

Thank you for your time!

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