Machine Learning Fairness Project
Group 4:

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Please refer to the following notebooks for execution of the corresponding code - apologies for not presenting the report all in one aggregated place:

LFR

SVM

Logistic Regression

Our results are as follows:

Model Name	Accuracy	Calibration	Parity	Equality of Odds
SVM	97%	Protected 97% Nonprotected 97.4%	Protected 53.9% Nonprotected 40%	Protected True Positive 100% False Negative 5.6% Nonprotected True Positive 100% False Negative 4%
Logistic Regression	59.1%	Protected 56.9% Nonprotected 62.5%	Protected 48.3% Nonprotected 45.1%	Protected True Positive 28.2% False Negative 20.1% Nonprotected True Positive 100% False Negative 22.6%
LFR	45.9%	Protected	Protected	Protected

		51.2% Nonprotected 53.1%	64.1% Nonprotected 58.4%	True Positive 64.5% False Negative 63.2% Nonprotected True Positive 65.4% False Negative 54.2%

Note that of all the metrics, SVM has the best results and is the closest to the objective truth. Although its parity might seem low on the surface, note that the 51.2% of the protected group will return to criminal behaviour and 37.4% of the nonprotected group will do so as well. The other models suffer from bias despite removal of the sensitive attribute, and are more likely to predict the protected group within the positive target variable, suggesting that more complex reasons outside of the presence of the sensitive attribute but related to it can contribute to it.