

# Recidivism Analysis: Bias in AI Criminality Assessments

Michigan Data Science Team Fall 2025  
Mid-Semester Expo



01

# Background

A Brief History of COMPAS and Its Shortcomings



# What is “Recidivism”?

WORD OF THE DAY

JULY 6, 2022

# recidivism

*noun* | rih-SID-uh-viz-um

relapse into criminal behavior



[m-w.com/word-of-the-day](https://www.m-w.com/word-of-the-day)

# What is COMPAS?

- The COMPAS (Correctional Offender Management Profiling for Alternative Sanctions) algorithm is a **risk assessment algorithm** that predicts whether a criminal will recidivate in the next 1-3 years
- Risk assessment algorithms are used in the criminal justice system to predict the chance of a certain event
  - Not showing up to trial, reoffending, etc.
  - COMPAS is one of the largest , which focuses on reoffenders (recidivism)
- This project explores the algorithm's potential **biases against different demographic groups**, with a particular focus on racial disparities

02

# Progress Update

What we have accomplished as a team so far



# Topics Covered

## Data Cleaning & Exploration

Cleaned the COMPAS dataset using Pandas, addressing issues such as missing values, naming, and value types.

Conducted EDA on the dataset to understand its variables, content, and structure.

## Error Bias & Analysis

Used confusion matrices to understand errors in the COMPAS model such as false positives and negatives.

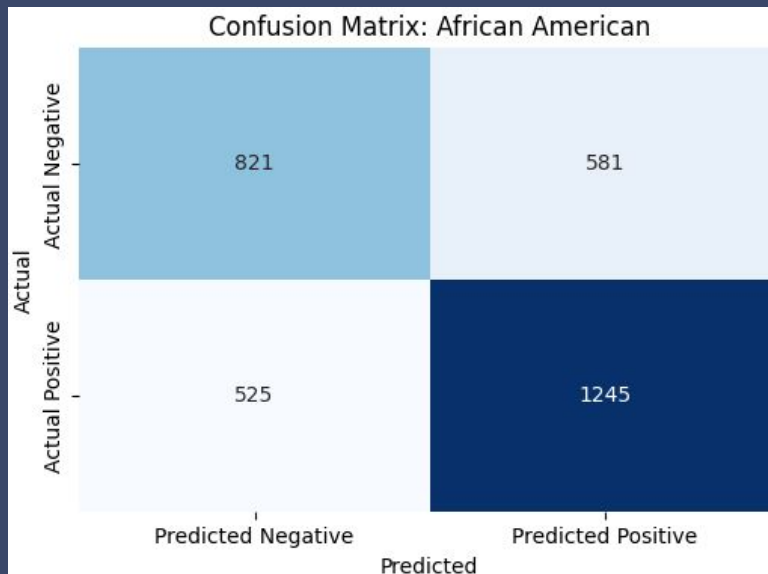
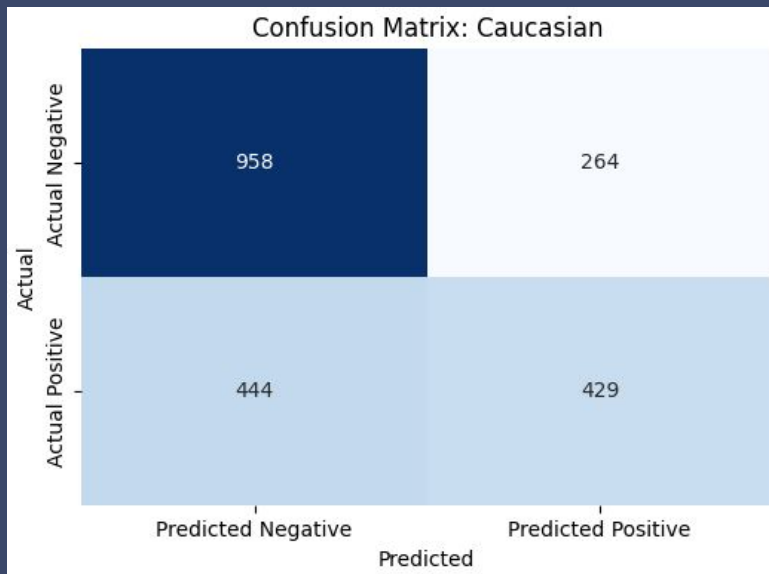
Analyzed bias within different demographics by using performance metrics

## Logistic Regression

Looked at how different factors influence scores given by the COMPAS algorithm (High vs. Low)

Logistic Regression also allowed us to adjust for confounding variables in our analysis.

# Our Findings



**False Negative rates and False positive rates differ:**

- False negative rates 23% higher for white defendants
- False positive rates 45% higher for black defendants

03

# Next Steps

Where we plan to take our project in the coming weeks





# Remaining Weeks Overview

## Week V



**Cox Proportional Hazards** - Testing how Variables Influence Recidivism Risk over Time

## Week VI



**Kaplan-Meier Curves** - Differentiating Risk across Groups over Time

## Week VII



**Subgroup Work Session #1** - Brainstorm Ideas and Explore Possibilities

## Week VIII



**Subgroup Work Session #2** - Research Topics and Finalize Presentations



# Thank You!

Do you have any questions?

Feel free to ask us now, or you can send us emails at:

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**BEST OF LUCK WITH YOUR PROJECTS  
THIS SEMESTER!!**

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