Chicago Car Crashes

By Olaide Kashimawo

Outline

- Business Understanding
- Data
- Exploratory Data Analysis
- Result
- Recommendation

Business Problem and Understanding

- This project seeks to create a multi-classification model to accurately identify the primary contributory cause of car crashes in Chicago

- I will analyze the data of car crashes to determine which factors are most likely to lead to injury and build a predictive model to alert emergency medical services dispatchers of the potential injury.

Data

- According to statistics from the state of Chicago department of transportation in 2022

- With an average of 70,000 reported each week and 20,000 crashes result to in injuries

- There were three datasets that we observed, "Traffic Crashes - Crashes", "Traffic Crashes - Vehicle", and "Traffic Crashes - People" which were merged into one data.

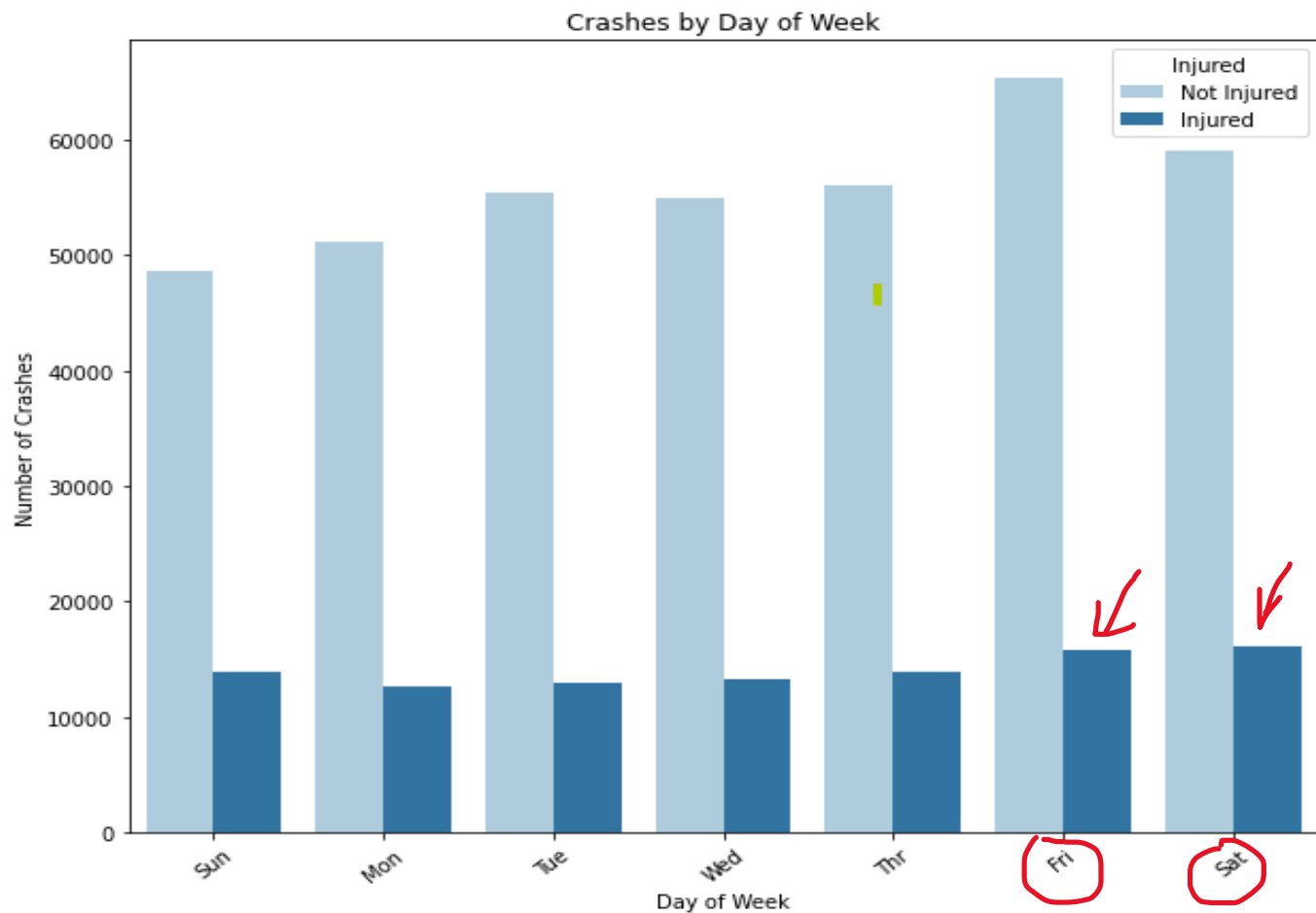- Chicago department of transportation Crash Dataset contains almost 500,000 data.

EXPLORATORY DATA ANALYSIS

Primary Causes of Crashes

Primary Cause of Crashes
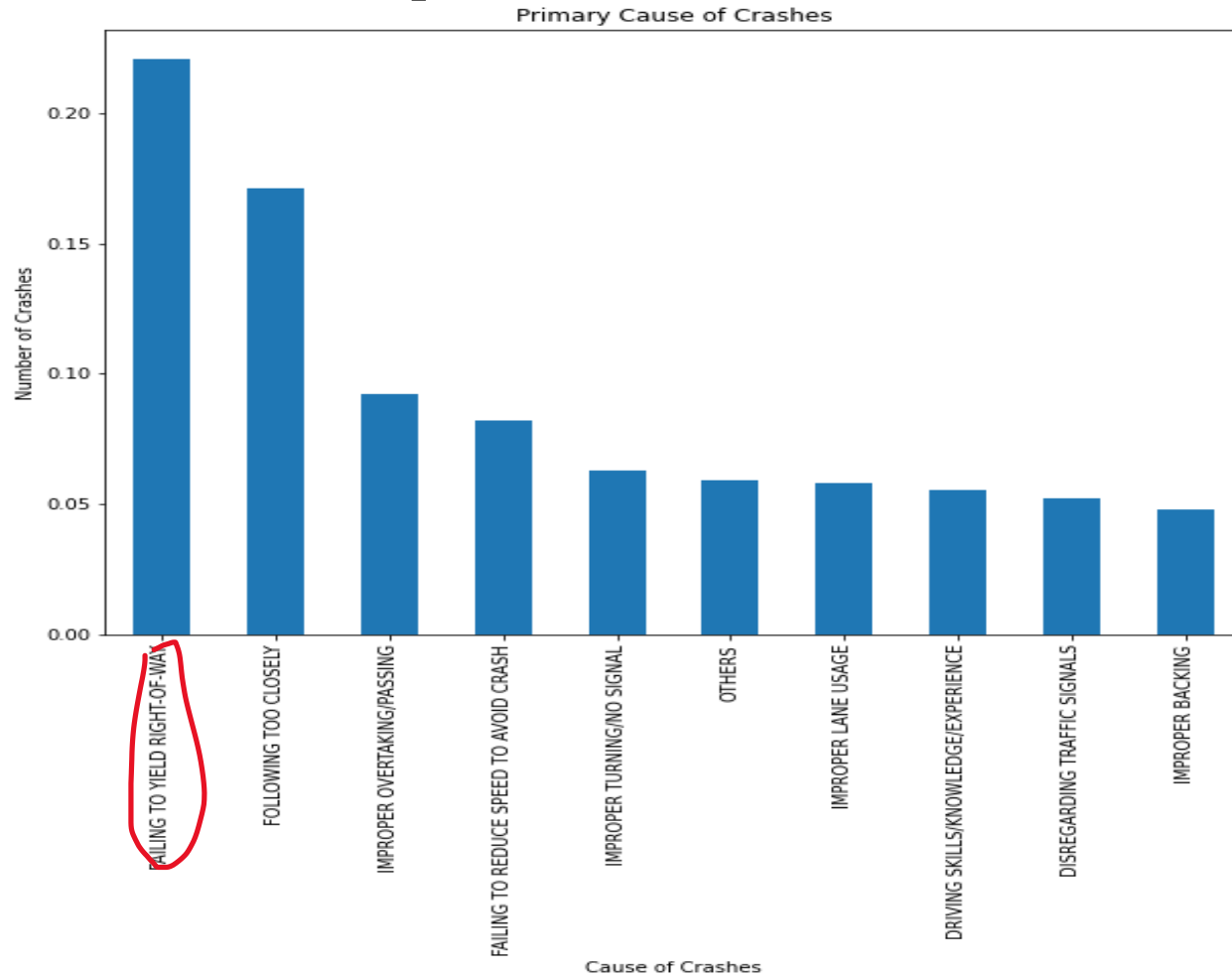
Some major causes of crashes are;
- failing to yield the right of way
- following too closely
- improper overtaking/passing
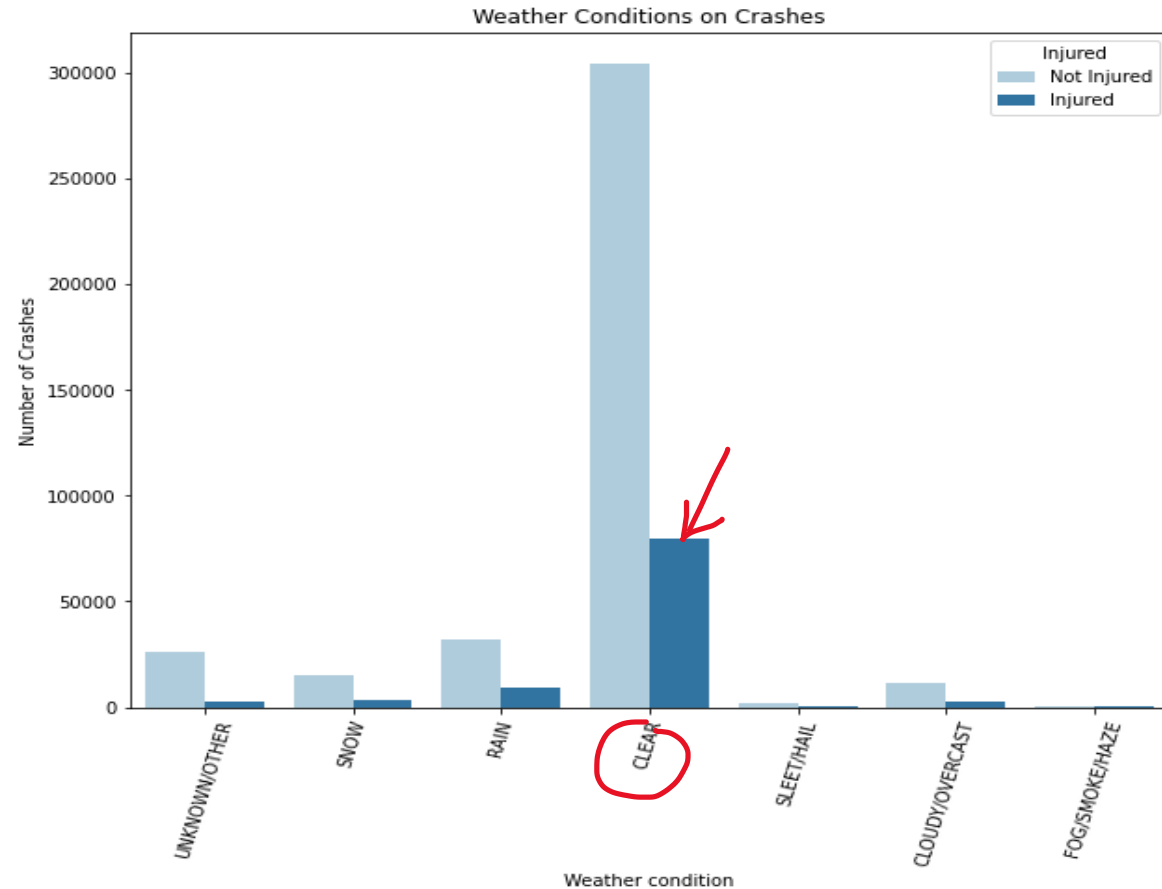- failing to reduce speed to avoid a crash

Crash day of the week
Relationship between crashes and injury

Most accidents occurred on weekends mainly(on Fridays and Saturdays)

Weather Conditions
Relationship between Weather conditions and injury

From the visualization above we can see most crashes happens in broad daylight.
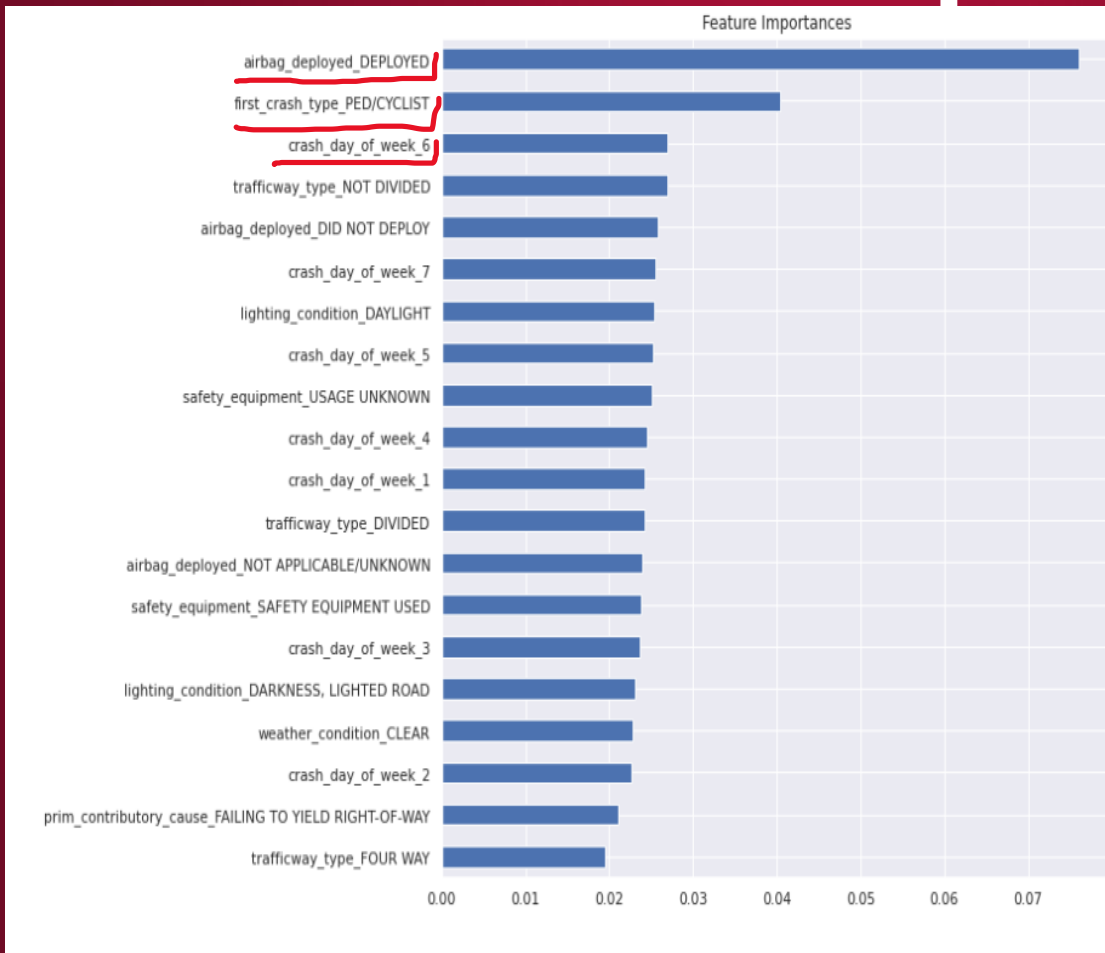
RESULT

MODEL	PRECISON(Injured)	RECALL(Injured)	F1- SCORE (Injured)
RANDOM FOREST CLASSIFIER	0.91	0.69	0.79
SMOTE RANDOM FOREST CLASSIFIER	0.97	0.96	0.96

Overall, using SMOTE has significantly improved the performance Random Forest classifier, as shown by higher F1 SCORE and better RECALL on the resampled data.

Feature Importance's

Feature Importances

- The airbag deployed

- Pedestrians/Cyclist

- Crash day of the week is Saturdays

- Trafficways type Not divided

Recommendations

- Increase enforcement of traffic laws and regulations, particularly with respect to distracted driving and failure to maintain a proper lane.

- Installation of physical barriers between opposing lanes of traffic, wider lanes, and better marking of lanes and road edges.

- Encourage the use of advanced driver assistance systems (ADAS) for instance blind spot detection, lane departure warning, and automatic emergency braking.

.

Next Step

To further analyze to better understand the factors that contribute to crashes;

- Analyze driver behavior and roadway design.
- Binning data to find crash locations can suggest lowering a speed limit or add
  ing a traffic signal soon.

.

Thank you!
GitHub link: HTTPs://github.com/olaidekashimawo/
Email: goldprint3@outlook.com

.