Prediction of Cirrhosis

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Source

Cirrhosis Prediction Dataset:

https://www.kaggle.com/datasets/fedesoriano/cirrhosis-prediction-dataset

Business Problem

To assist a drug company to evaluate Drug D- penicillamine and its effects on different known contributors to Cirrhosis.

Goal

The goal of is to help the drug company understand the effects and know how to properly market the drug, if it is shown in the data, that it prevents Cirrhosis.

Methods

With the data provided, we were able to create various different machine learning models.

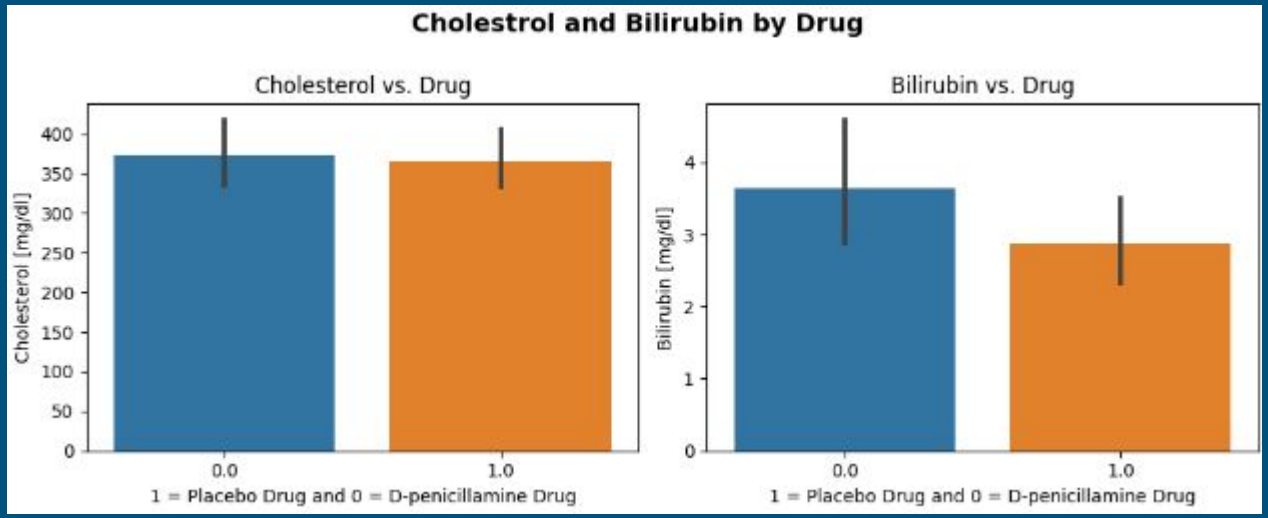
Models for review:

- Visual #1 -Side by Side Barplots
  - 1. Cholesterol vs 2 Drugs (Placebo vs D-penicillamine)
  - 2. Bilirubin vs 2 Drugs (Placebo vs D-penicillamine

- Visual #2 - Barplot (Stages of Cirrhosis vs. Cholesterol Level)

- PCA Model

Visual #1- Barplot (Stages of Cholesterol vs 2 Drugs



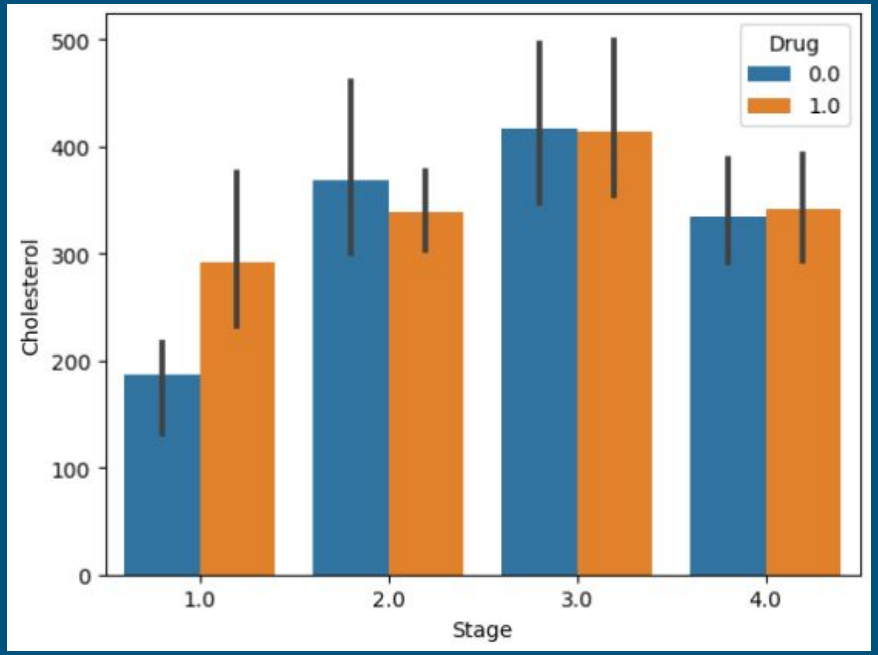
Cholesterol

1. High Cholesterol is over 200
2. No big significance difference between 2 drugs when comparing Cholesterol
3. D-penicillamine didn't affect the cholesterol levels

Bilirubin

1. The approximate normal range of bilirubin in the blood is less than 1.0 milligram per deciliter (mg/dL).
2. Slight decrease in Bilirubin levels for those that took D-penicillamine
3. D-penicillamine does slightly lower Bilirubin levels

Visual #2 - Barplot (Stages vs. Cholesterol Level)



- Blue = (0.0) Placebo
- Orange = (1.0) D-penicillamine

- With exception to Stage 1, other stages had cholesterol levels over 200.

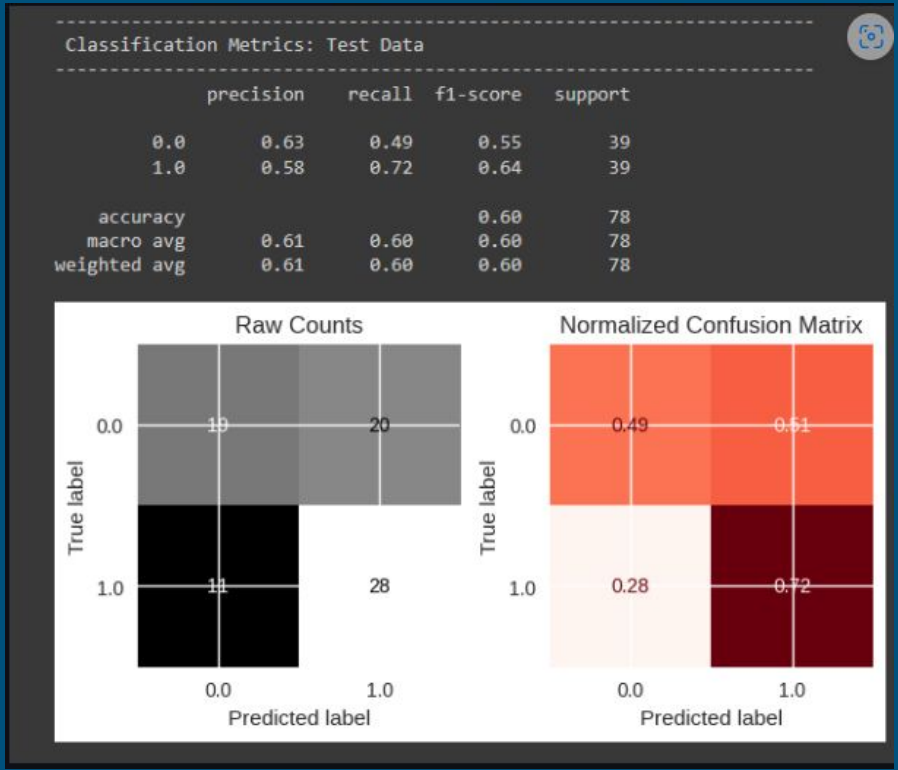
- In Stage 1 the D-penicillamine has higher level of Cholesterol

- In Stage 3 and Stage 4 performed neck and neck, so this tells me D-penicillamine had no affect.

- In Stage 2 D-penicillamine had a slight improvement on the cholesterol levels.

- D-penicillamine does not seem to affect the Cholesterol level by Stages.

Metrics for best Model



- This model lowered the Type II (False Negatives) which is the best beatrix to concentrate on when dealing with a medical disease.

- We want to have the least amount possible of False negative because this means patients would be told they don't have the disease and they really do and they will not get treated.

Final Recommendations

- The data obtained indicates that the drug D-penicillamine lowered Bilirubin levels and was not effective on Cholesterol levels.