Patient Survival Prediction

A PRESENTATION BY JOCEL ARCELONA

BUSINESS PROBLEM

Maimonides Medical Center in Brooklyn is in need of a preliminary screening test to predict a patient's mortality after being admitted to the ICU.

Stakeholders

Maimonides Medical Center in Brooklyn, New York

OBJECTIVES

- Clean and Analyze a Patient Survival Prediction dataset
- Figure out features that most accurately predicts a patient's mortality after being admitted to the ICU
- Create, use and tune multiple classification models to figure out which model produces the best recall score

Data Source:

Rows: 90,000

Columns: 85

SUMMARY

Most common bodysystem: Cardiovascular

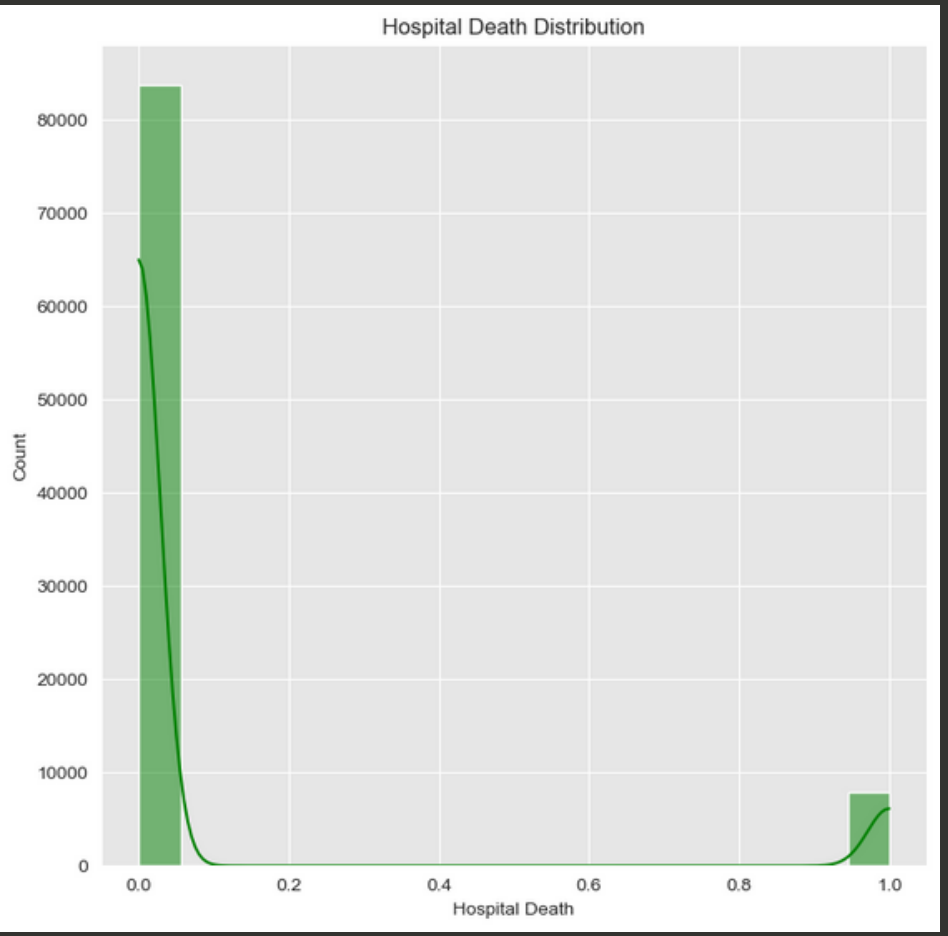
High Percentage of patients who died were first time admittance

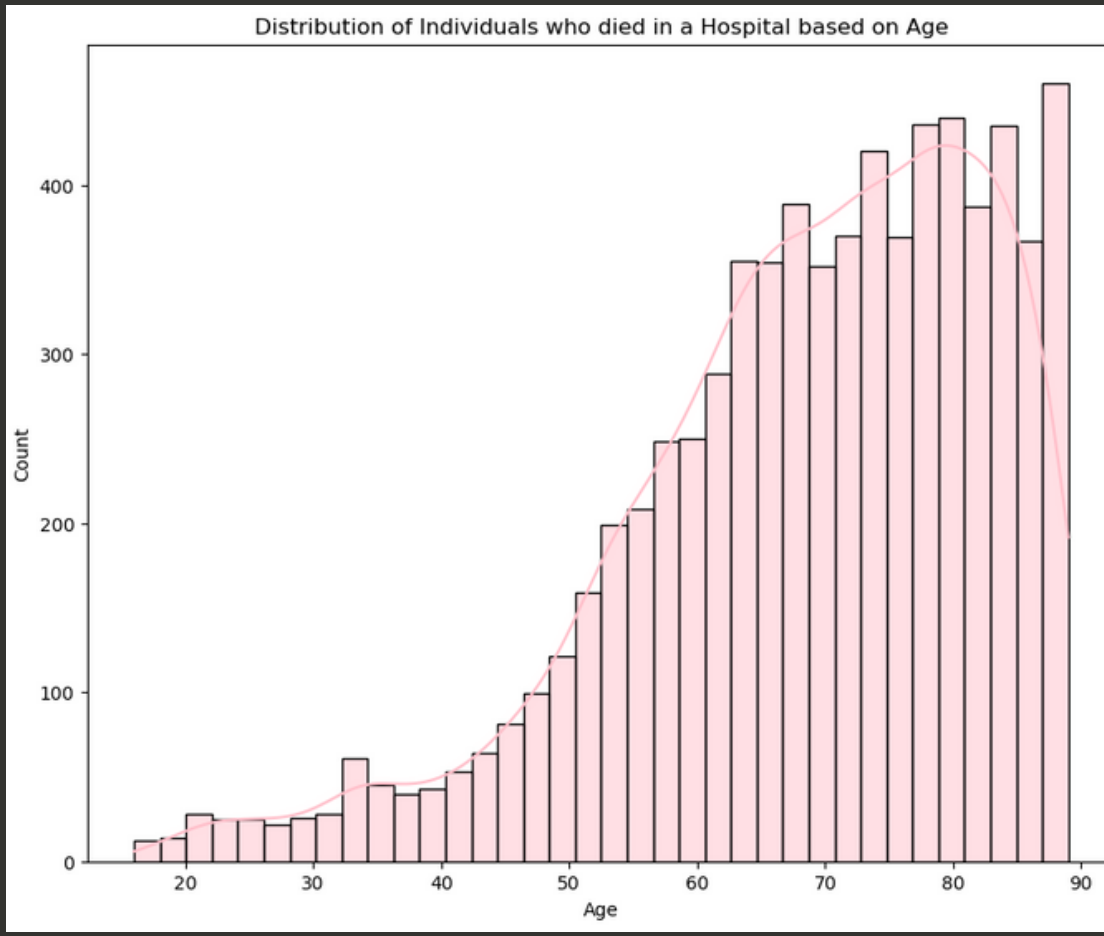
Most common ICU Admit Source: Accident & Emergency

High Percentage of patients who died were Caucasians

Most common ICU Type: Medical Surgery ICU

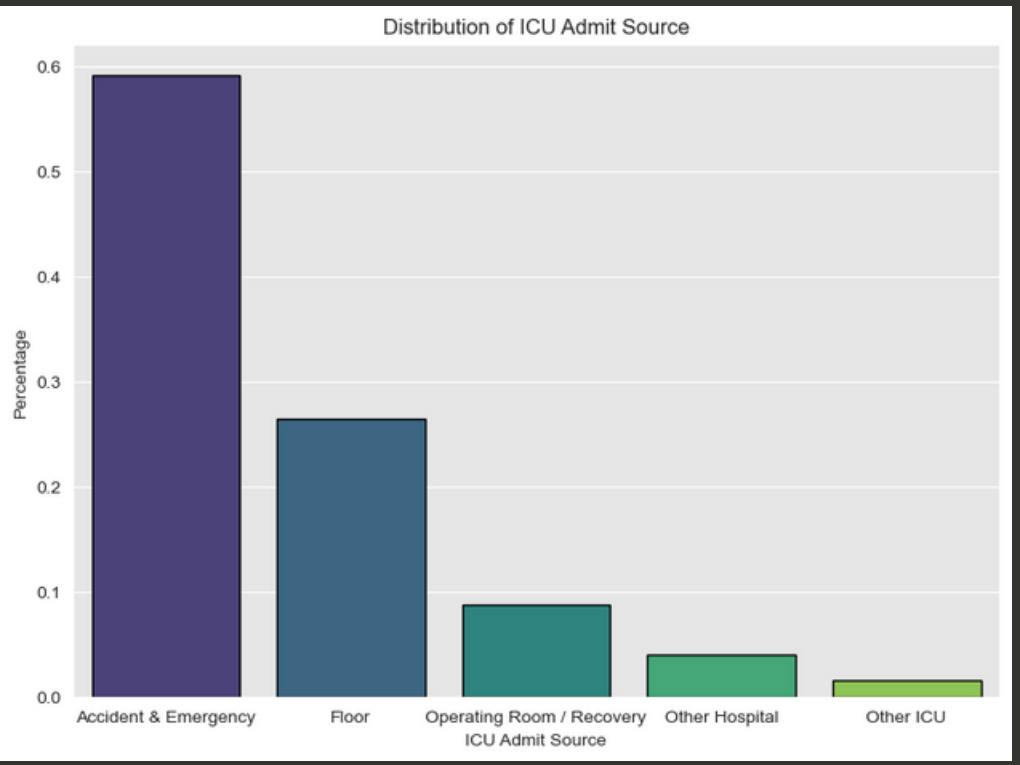
Focused on recall and lowering the amount of False Negative diagnosis

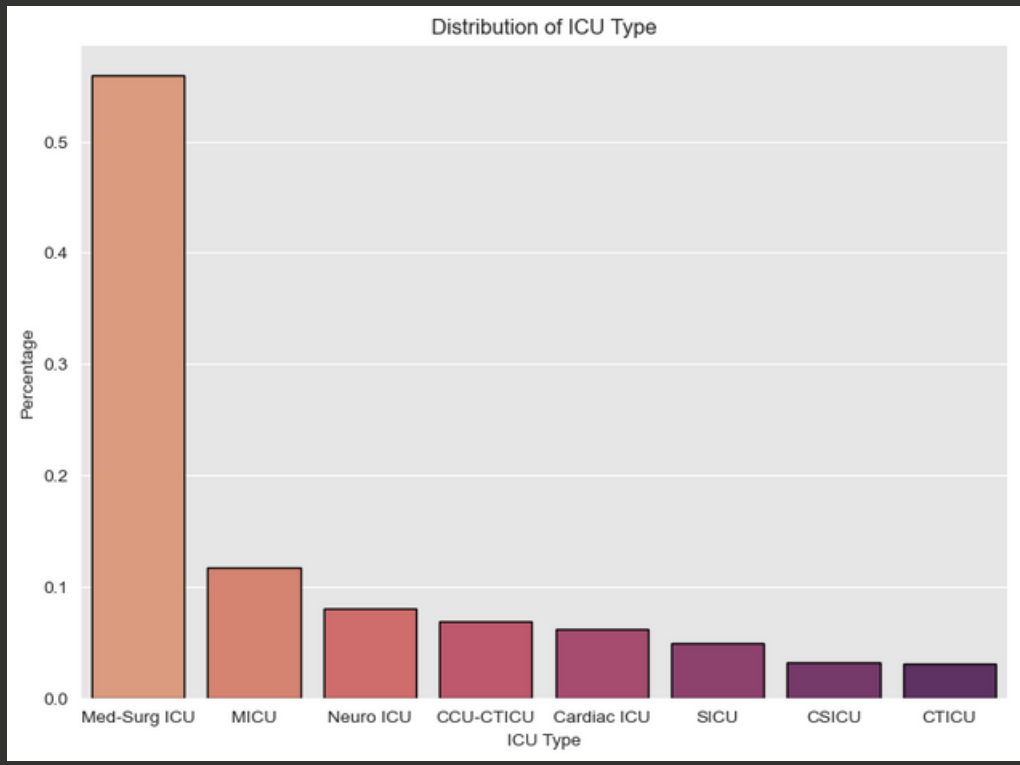




Findings:

1. Only about 10% of the patients in this dataset died in the hospital
2. Age of most patients who died rises around the Age of 50, so the older you are the higher your chances of dying when hospitalized

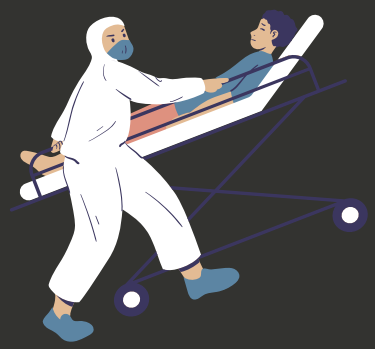


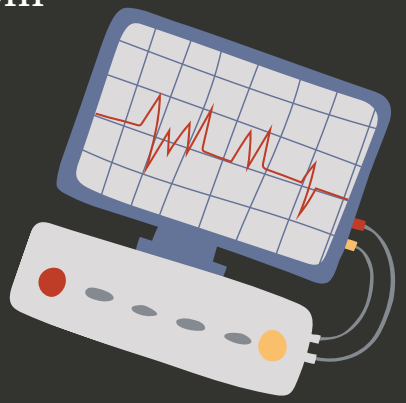


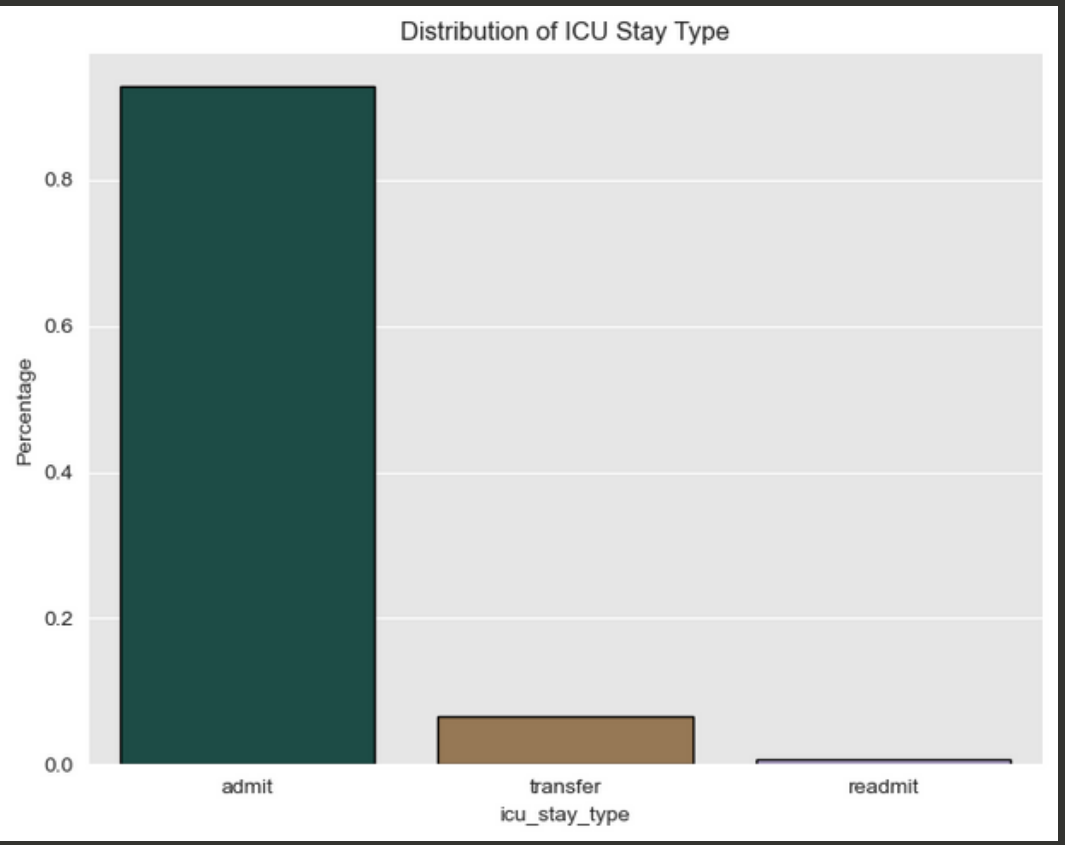
Findings:

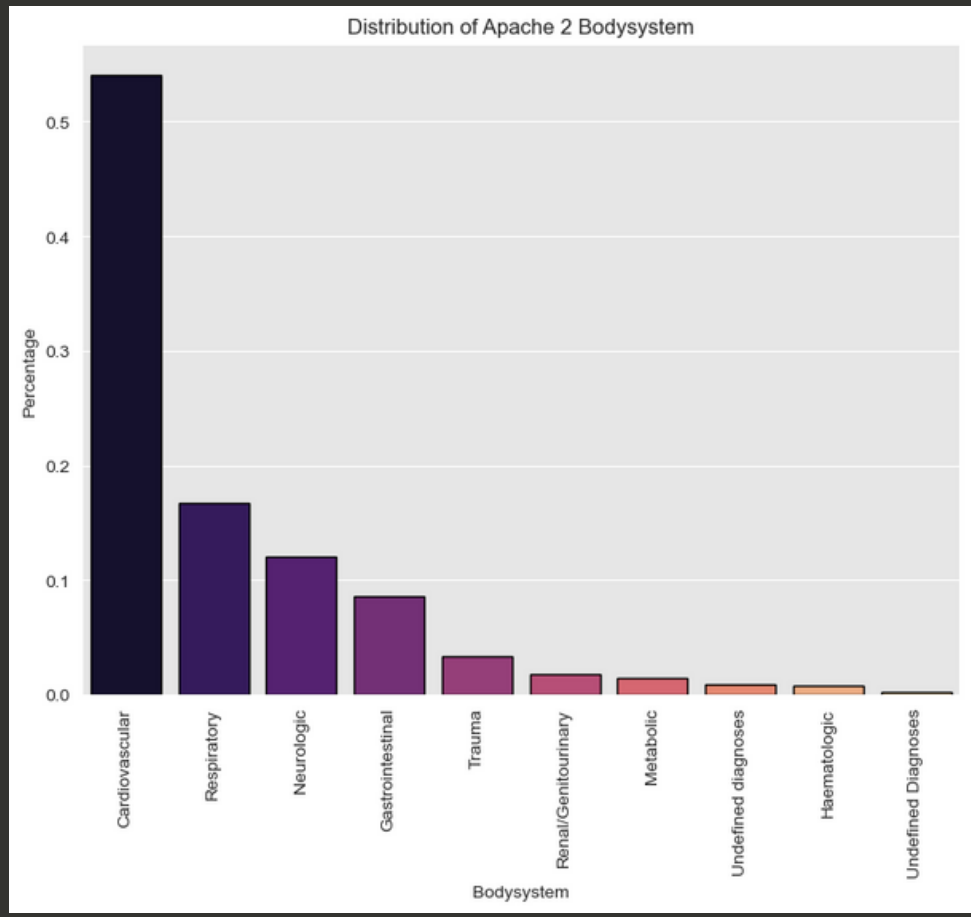
60% of patient who died were admitted in the emergency room

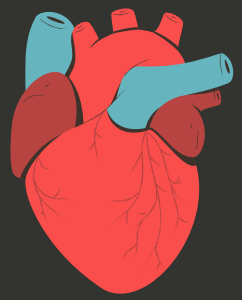
56% were in medical surgery ICU











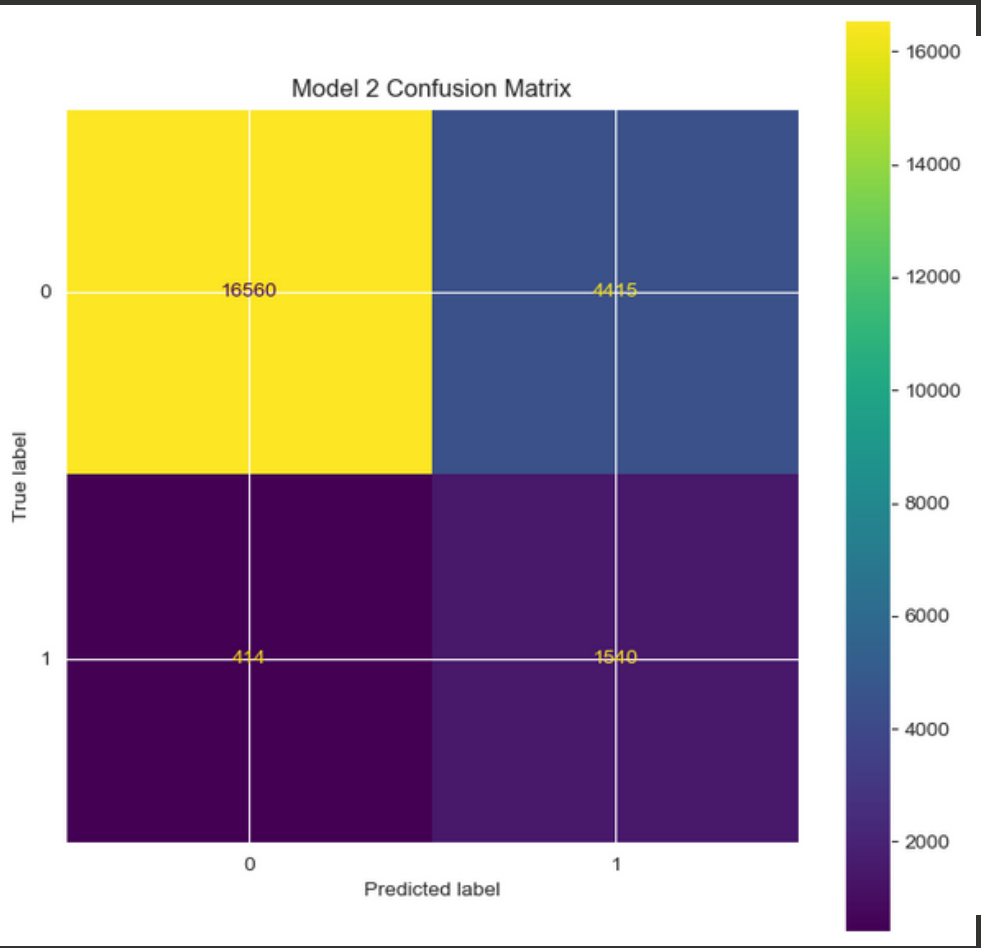
Findings:

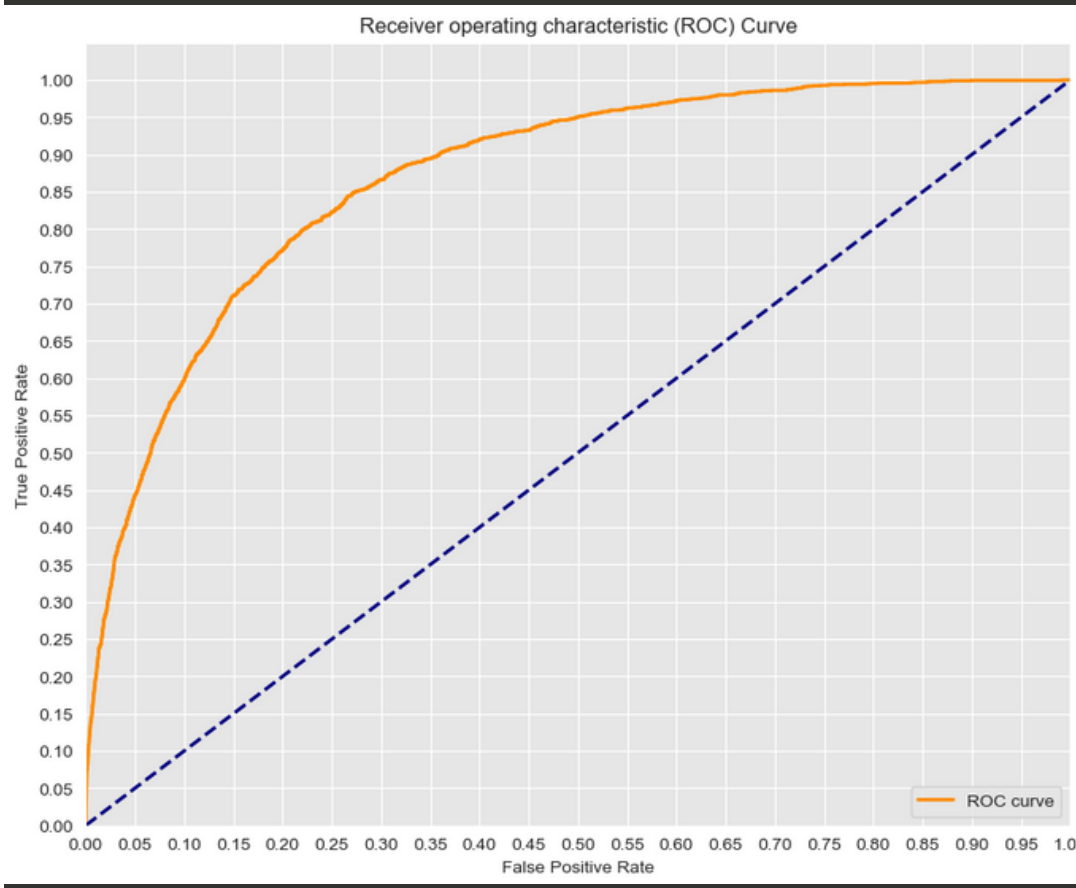
93% of patients who died were first time admittance patients

54% of deaths were caused by cardiovascular complications

	ACCURACY	RECALL	PRECISION
LOGISTIC REGRESSION	79%	78%	26%
GAUSSIAN NAIVE BAYES	71%	75%	19%
RANDOM FOREST	80%	73%	26%

Best model: Logistic regression





Recall Score: 0.788

AUC: 0.8696

RECOMMENDATIONS

Gather more data about a patient's:

- Lifestyle
- Type of Job
- Medications
- Reason of admittance
- Non-elective surgery

With more data about a patient, we can focus more on lowering false negatives and false positives at the same time considering that they are both misdiagnosis and could pose different risks for both the patient and the hospital involved.

Thank You

jocelarcelona@gmail.com

https://github.com/JocelArcelona

www.linkedin.com/in/jocel-arcelona