

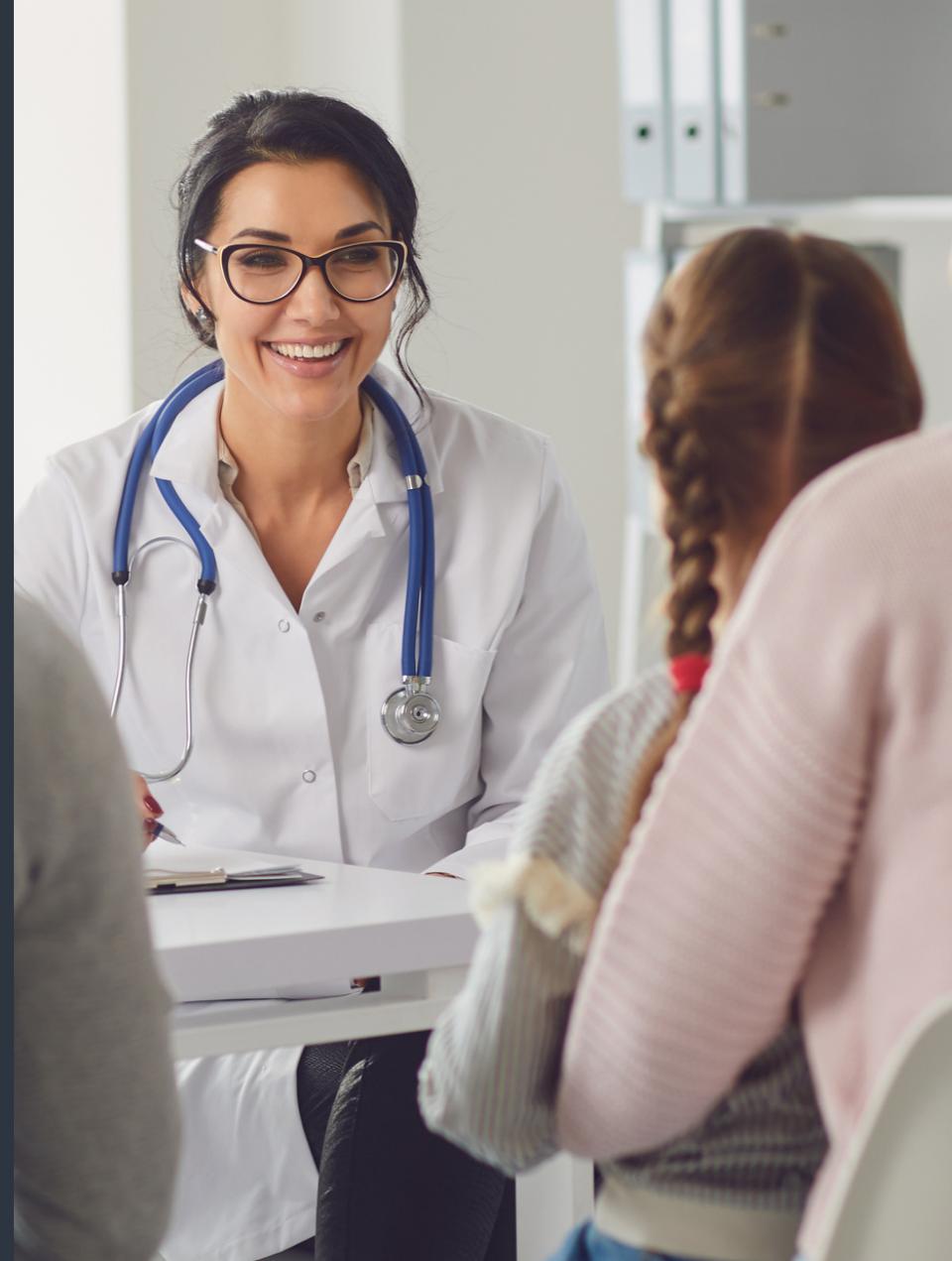
VITAHEALTH-254

Revolutionizing patient care through data-driven insights and machine learning



SCOPE

- Overview
- Problem Statement
- Objectives
- Model Analysis
- Recommendations
- Conclusions



VITAHEALTH-254



OVERVIEW

The project aims to leverage a comprehensive dataset containing various hematologic parameters such as haematocrit, haemoglobin, erythrocyte count, leucocyte count, thrombocyte count, MCH, MCHC, and MCV to develop machine learning models for classifying patients as either requiring in-patient or out-patient care

VITAHEALTH-254



PROBLEM STATEMENT

VitaHealth-254 aims to revolutionize the patient healthcare experience by providing medical professionals with predictive tools for patient classification that optimize resource allocation and enhance operational efficiency..

OBJECTIVES



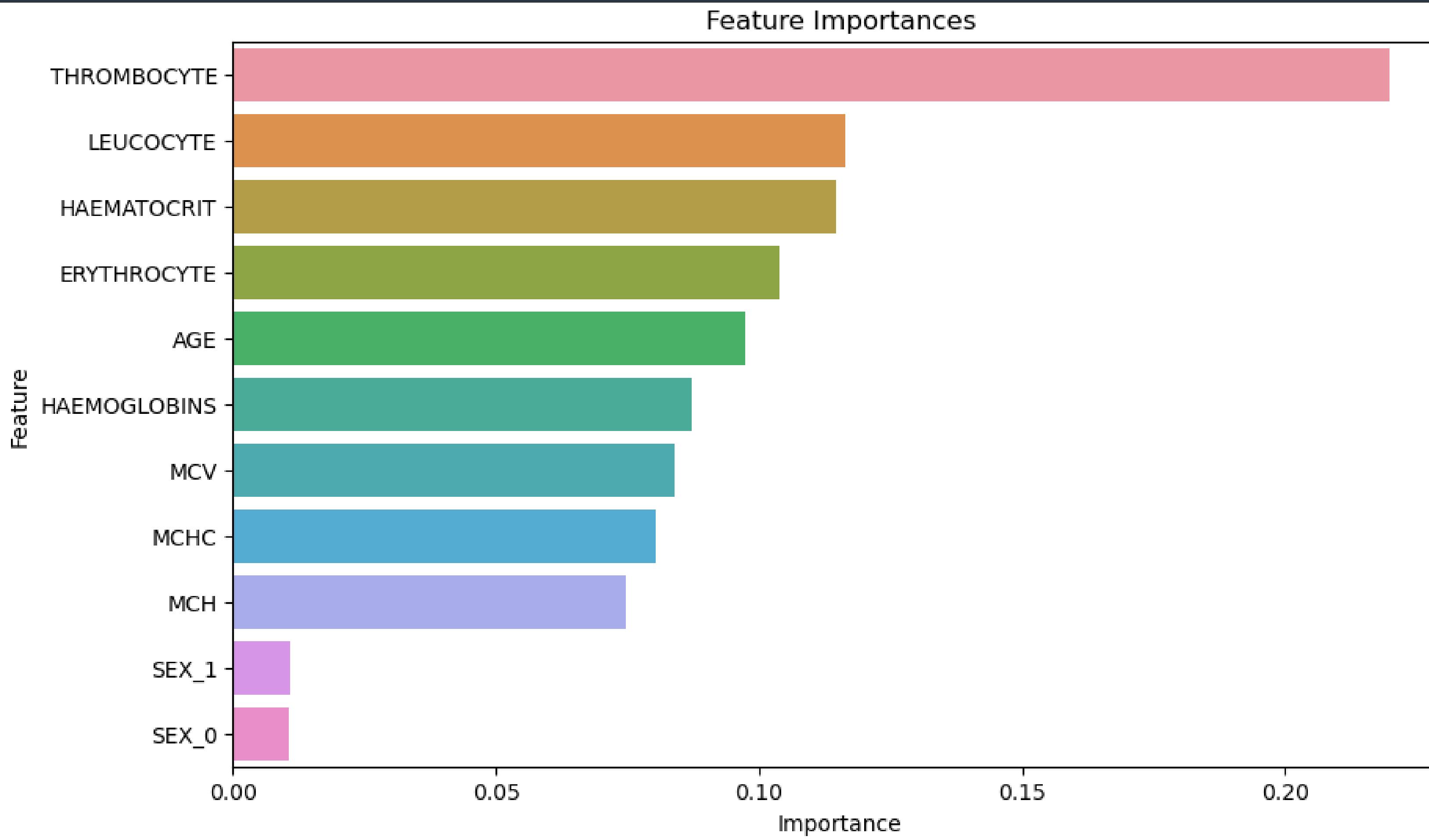
- Improve Patient Care Classification: Develop a model that automates the process of categorizing patients based on their laboratory test results to ensure timely and appropriate treatment
- Optimize Resource Allocation: By accurately predicting patient classifications, distribution of resources in the medical facility can be optimized hence improving efficiency and cost-effectiveness.



MODEL ANALYSIS

Feature importance

- Graph visualizes features that are most influential in predicting the target variable based on their respective importance scores.

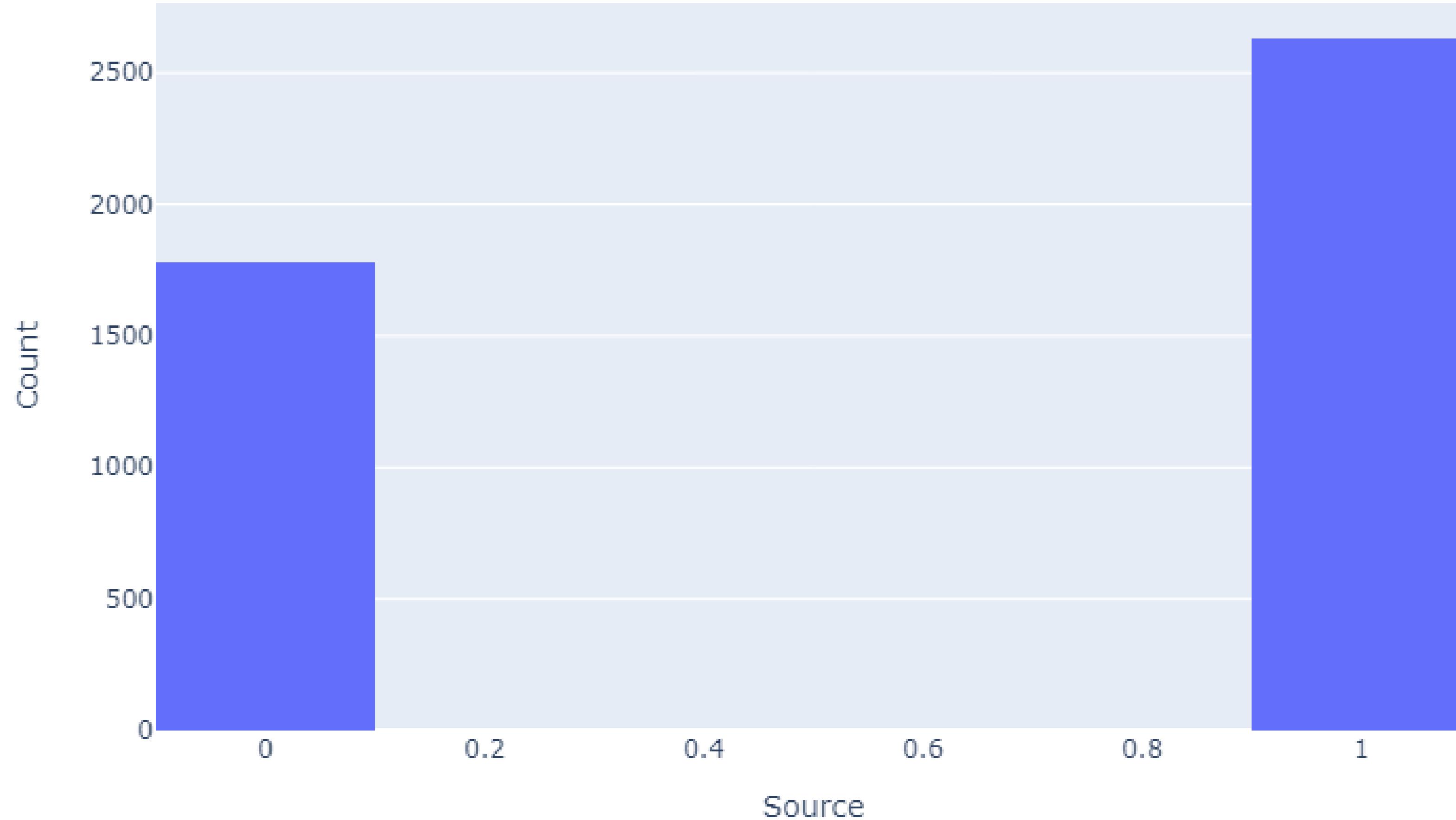




DISTRIBUTION OF SOURCE

- The visualization provides insights into the distribution and relative frequency of data from the source column (in-patient 0 and out-patient 1) within the dataset.
- The count of out-patients is 2628 and the count of in-patients is 1784

Distribution of Source

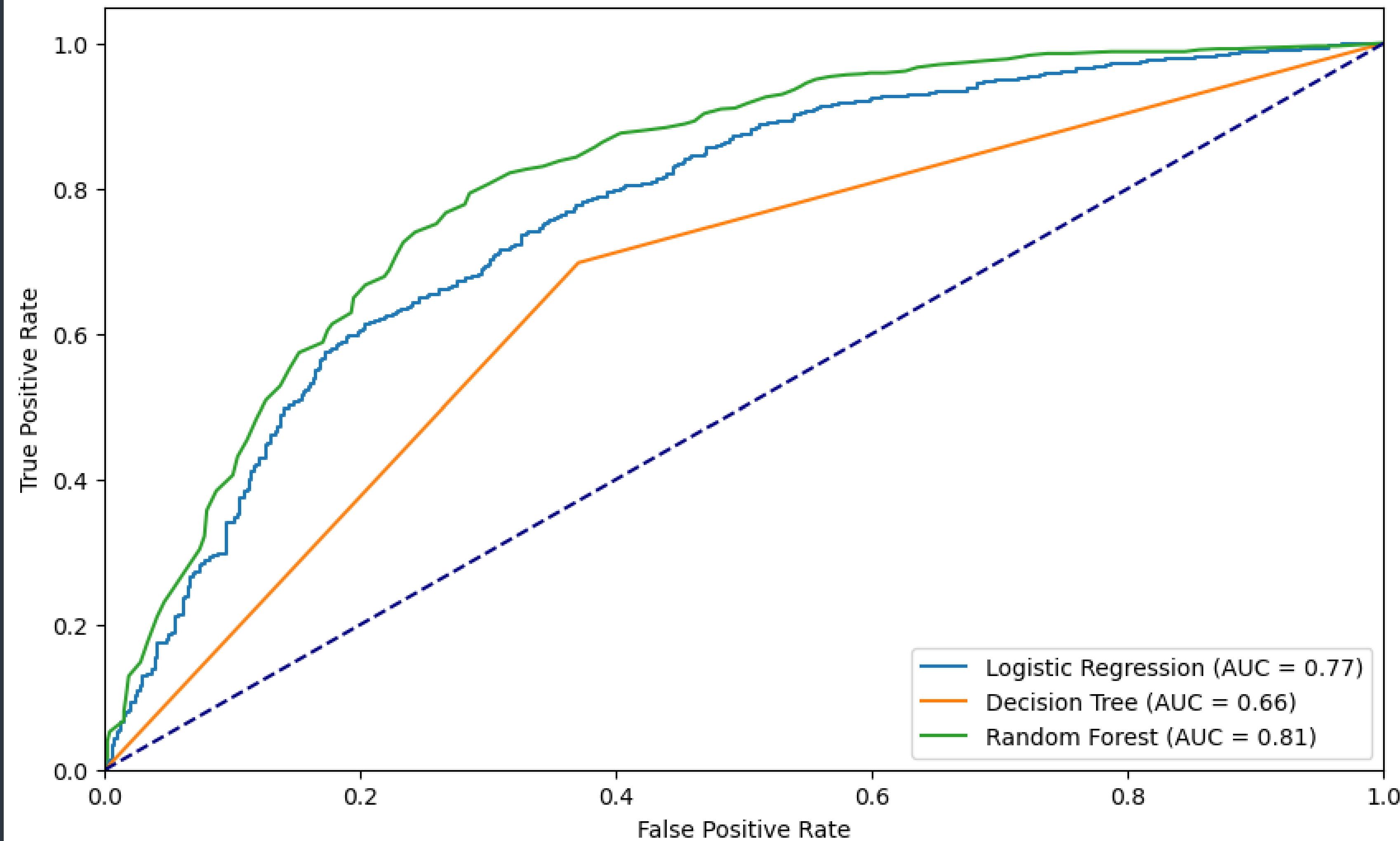




ROC CURVE

- The graph shows that Random Forest has the highest AUC score, indicating its effectiveness in distinguishing between positive and negative instances.
- The Random Forest model appears to be the best-performing model among the three based on the provided evaluation metrics.

Receiver Operating Characteristic (ROC)



RECOMMENDATIONS



- Introduction of intermediate checkup station for all patients classified as inpatient(0) by the chosen model.
- Equip the intermediate station with state-of-the-art blood screening equipment. This will enable more fine-tuned diagnosis due to the increase of blood parameters tested for anomalies.
- When planning for the overall patient capacity as well as appropriate staffing of the medical facility, the assumption of a 40% admission rate can be used to distribute resources appropriately.

CONCLUSIONS



- Leveraging the dataset obtained in research, this project developed a predictive model (with 75% accuracy) for the classification of patients based on haematological features.
- Furthermore, we were able to identify the need for an intermediate checkup station that would be used to provide additional specialized medical care for patients classified as needing overnight hospitalization.
- This would have the two-fold effect of providing extra medical attention to high-risk patients while accounting for any misclassification by the model.

THANK YOU