SyriaTel Churn Prediction Analysis

Prediction analysis on the likelihood of a subscriber to stop using SyriaTel services.

Presented by Miriam Nguru

Introduction

The telecommunications industry is undergoing rapid changes, presenting ongoing challenges for businesses. A key challenge is customer churn, also known as customer attrition, where customers discontinue using a company's services for various reasons.

Churn analysis is a vital technique aimed at understanding the reasons behind customer departures. This analysis is used to determine effective strategies for customer retention.

The objective of this project is to apply churn analysis techniques to provide SyriaTel, a telecommunications service provider, with actionable insights that will help improve customer retention.

Problem Statement

SyriaTel faces challenges in comprehending the reasons behind customer discontinuation from their services.

The client's objective is to maximize customer retention.

A predictive model is needed to identify features influencing customer churn.

The model must be trained on accurate data reflecting the likelihood of churn.

The results obtained will be utilized by various stakeholders, including management, marketing, and customer support teams, for targeted efforts in enhancing overall customer retention strategies.

Objectives

01   **To identify key features that significantly influence a customer to churn.**

02   **To develop a model that accurately estimates churn likelihood.**

03   **To evaluate the performance of the developed model**

04   **To interpret and give relevant advice to the client.**
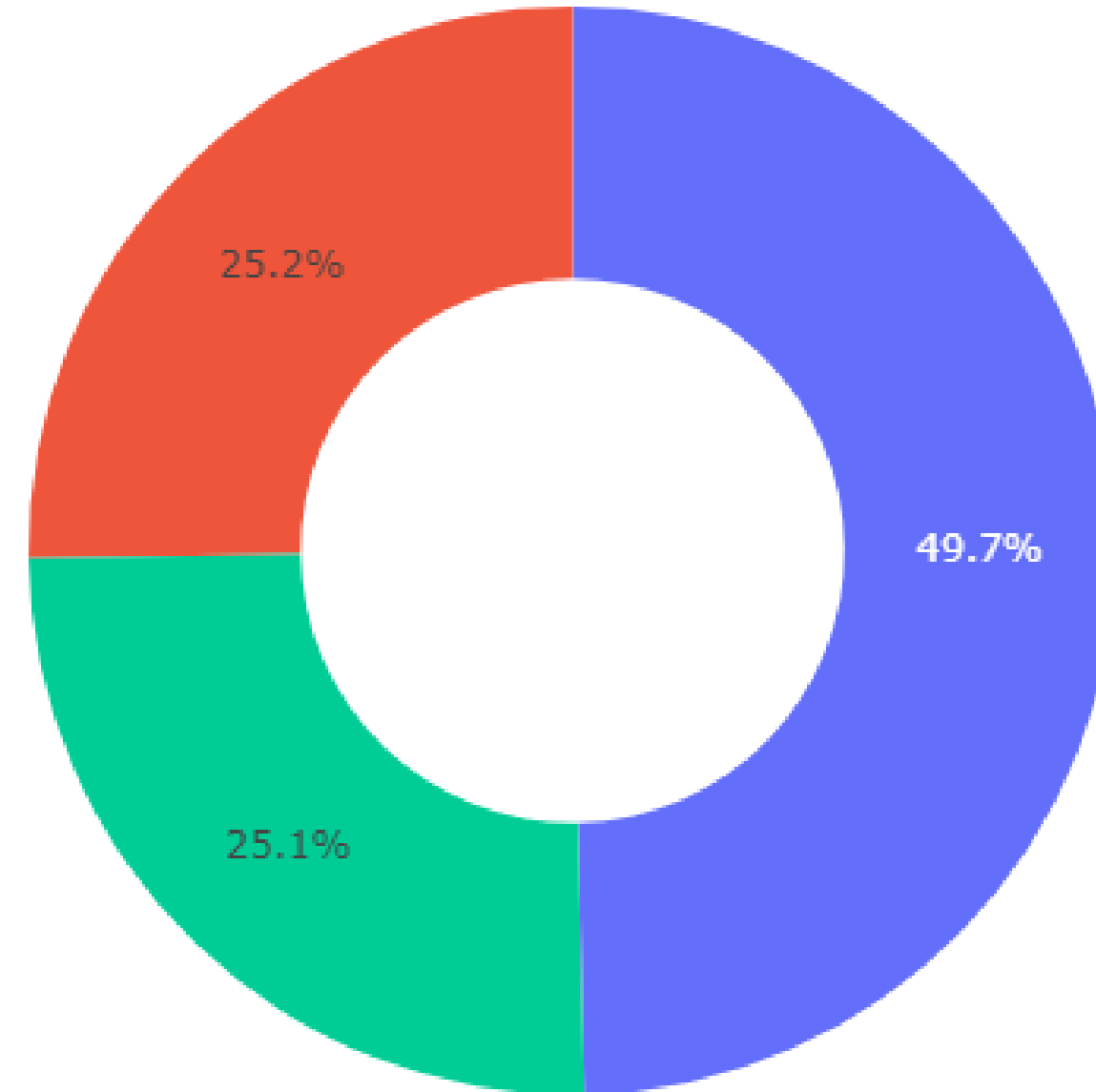
Exploratory Data Analysis

The percentage of loyal subscribers from the churn distribution is 85.5%. There is a class imbalance because 85% fall under false whereas 14% fall under true.
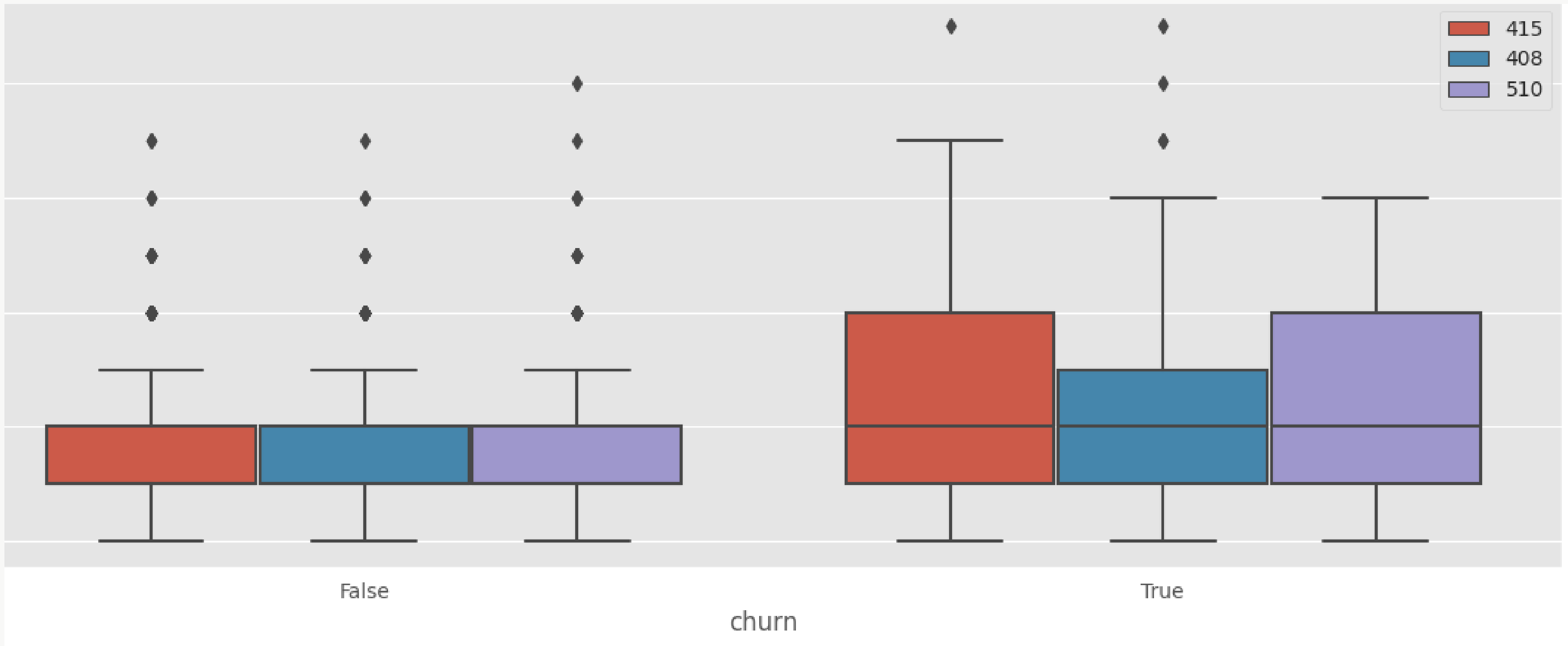
Churn Distribution

14.5%

85.5%
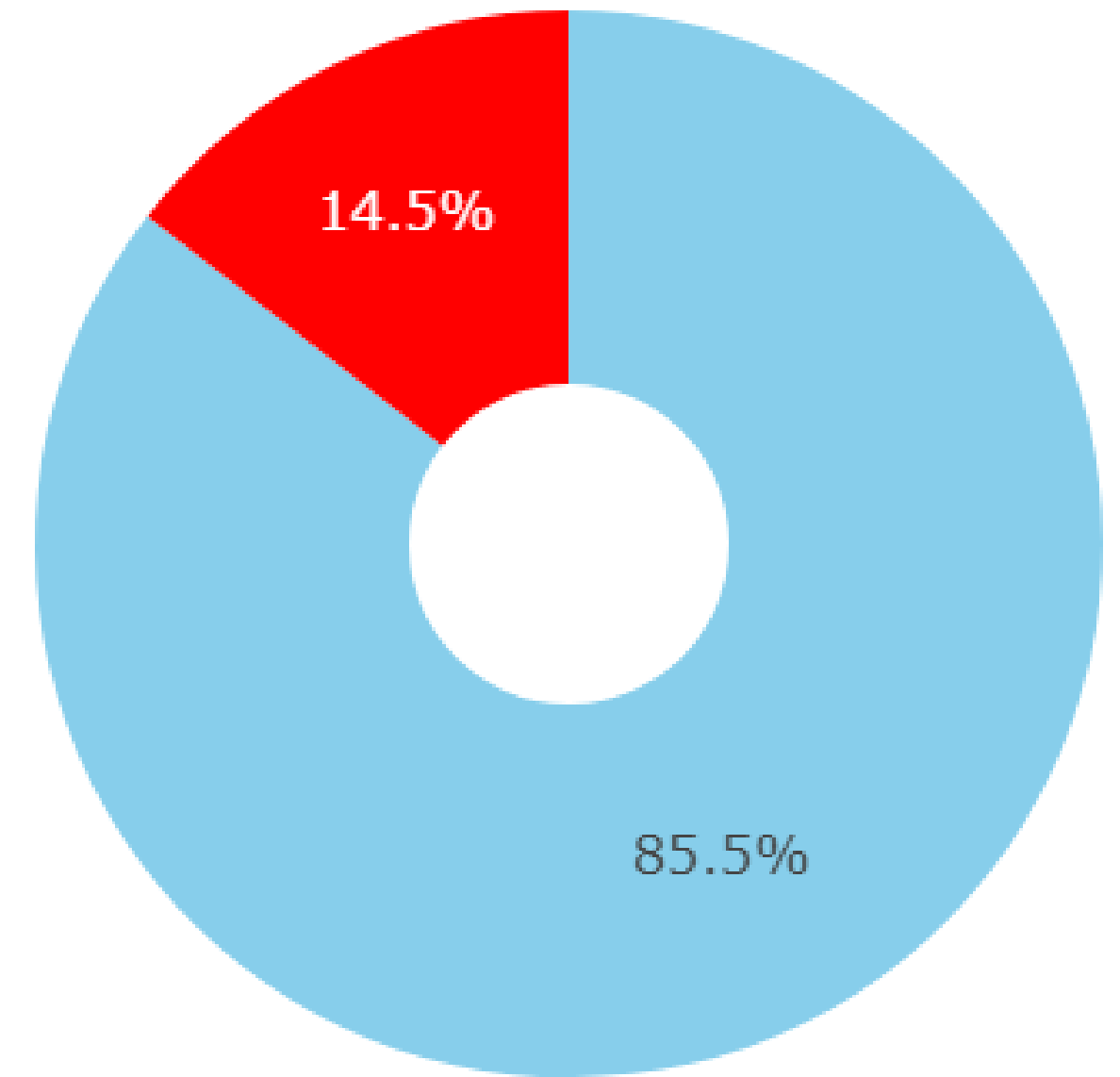
Exploratory Data Analysis

Distribution of Area Code Feature

Area Code 415 has the highest percentage for churn distribution. Almost half of the customers churned.

Exploratory Data Analysis

Most of the people who unsubscribed from the service were from area code 415 and 510 and theres also a number of outliers present.

Model 1: Logistic Regression

We used this model as our baseline model and will hence compare our results to this.

The model is exhibiting signs of overfitting, demonstrating strong performance on the training data but failing to generalize well to the test data.
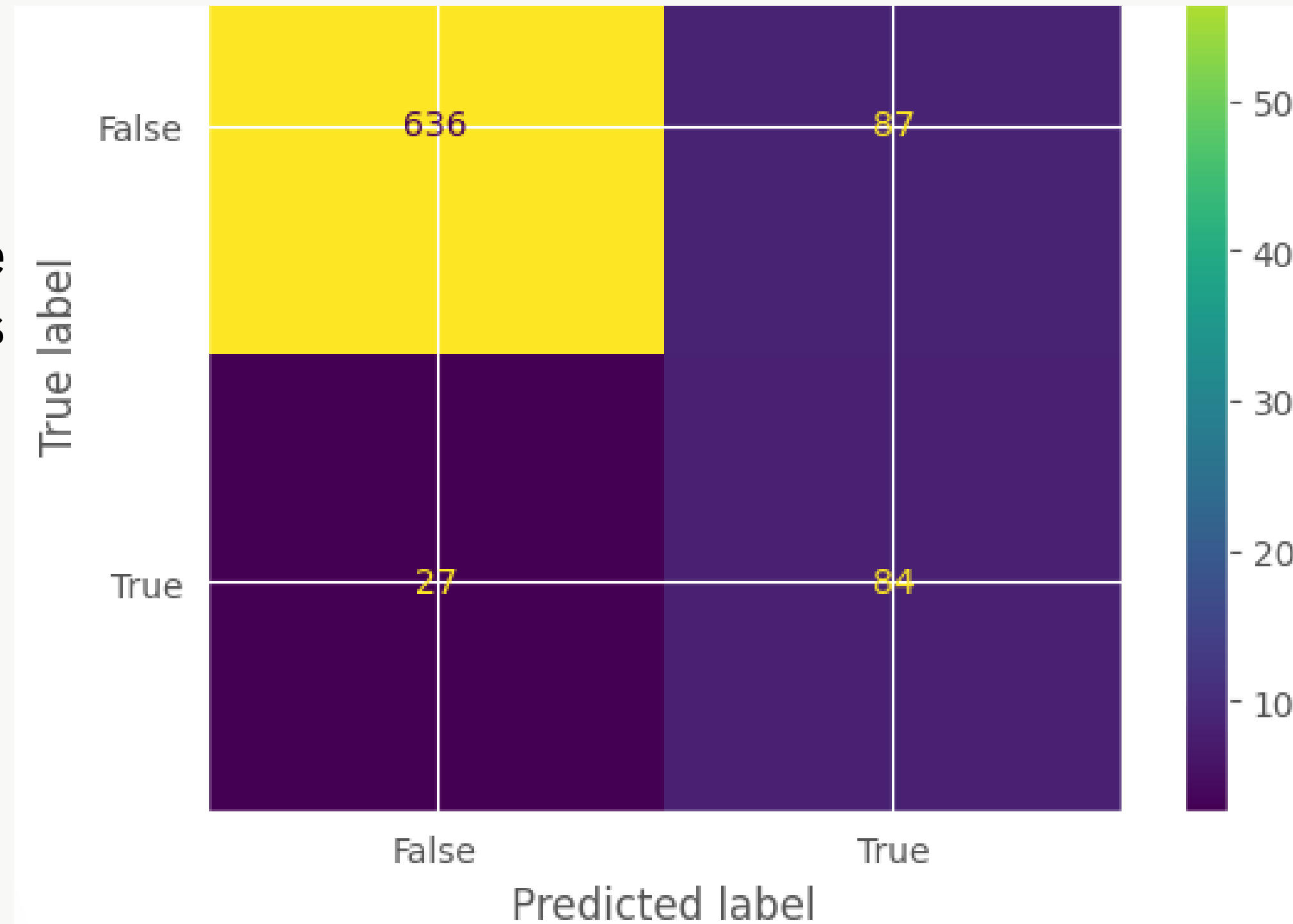
High accuracy of 0.905
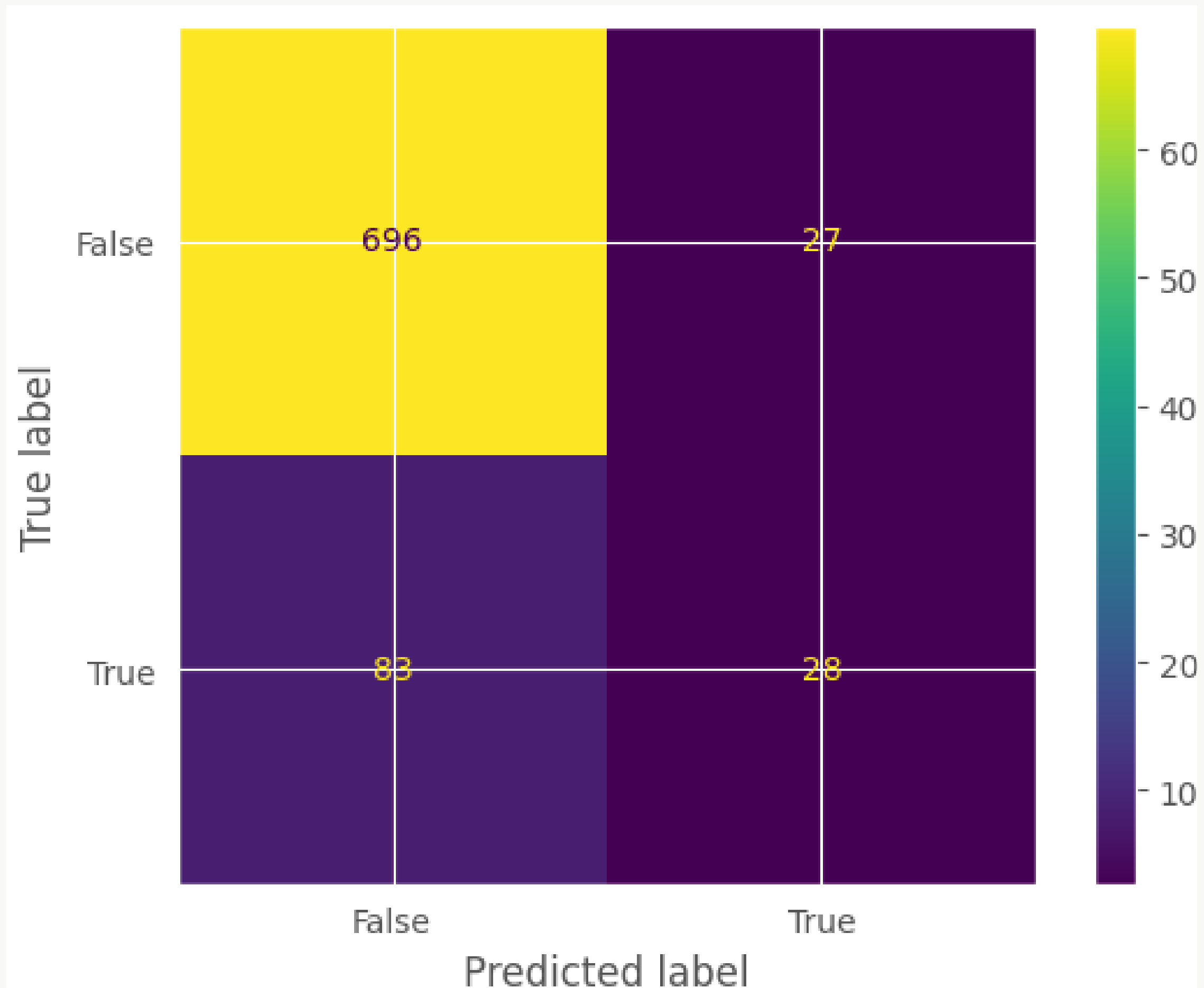
Model 2: Decision Tree

While the decision tree model outperforms the baseline model, it is important to note that it is exhibiting signs of overfitting.
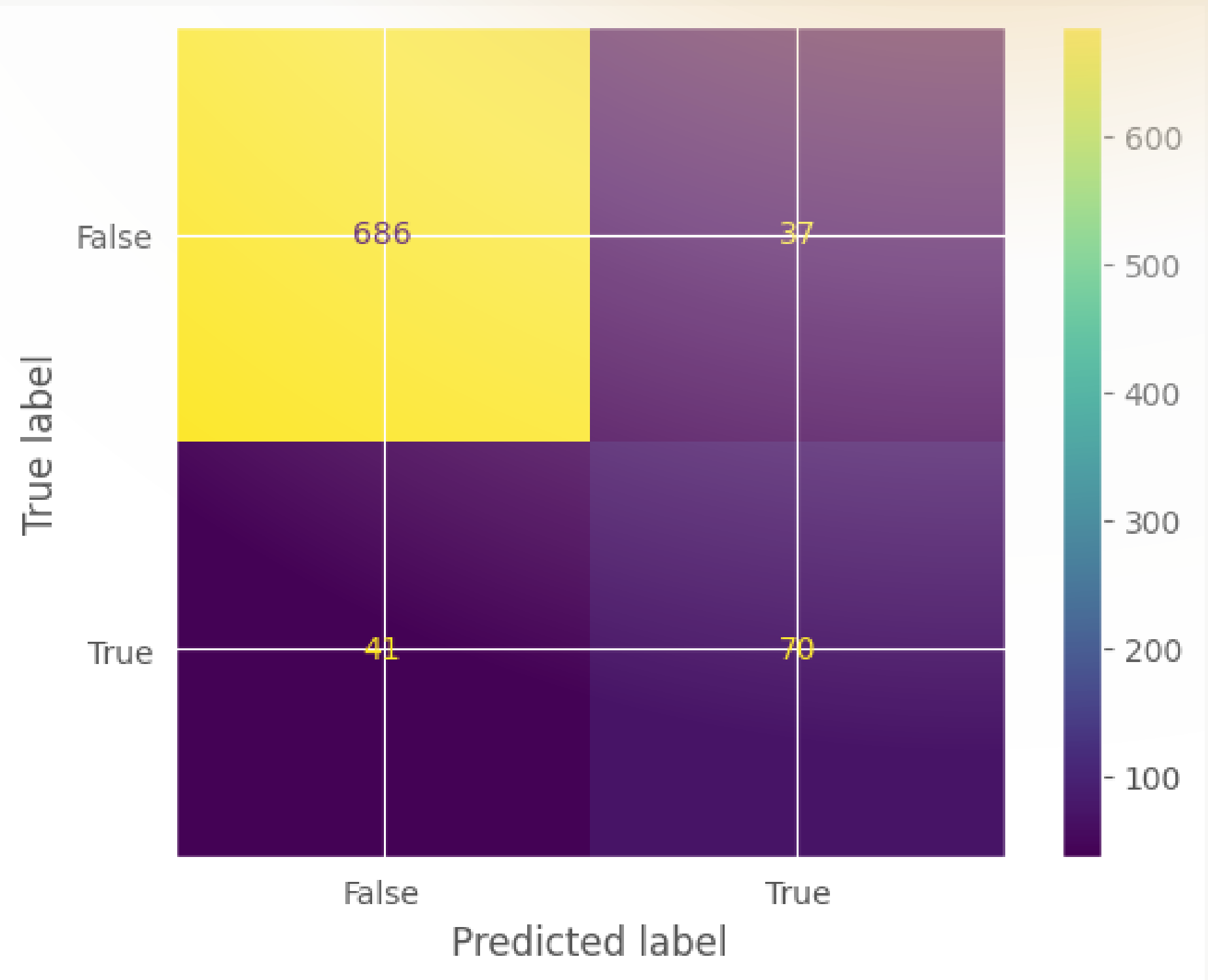
Model 3: RandomForest Classifier

The random forest model demonstrates a higher recall than the baseline logistic regression model but falls short in comparison to the decision tree model.

Accuracy Score of 0.906

The Model is also overfitting

# Model 4:Hyperparameter Tuning of Decision Tree Model

There is an improvement in performance, particularly in terms of the recall score. However, it's noteworthy that the precision score experiences a slight decrease

The gap between the training and testing scores has diminished, indicating a reduction in overfitting.
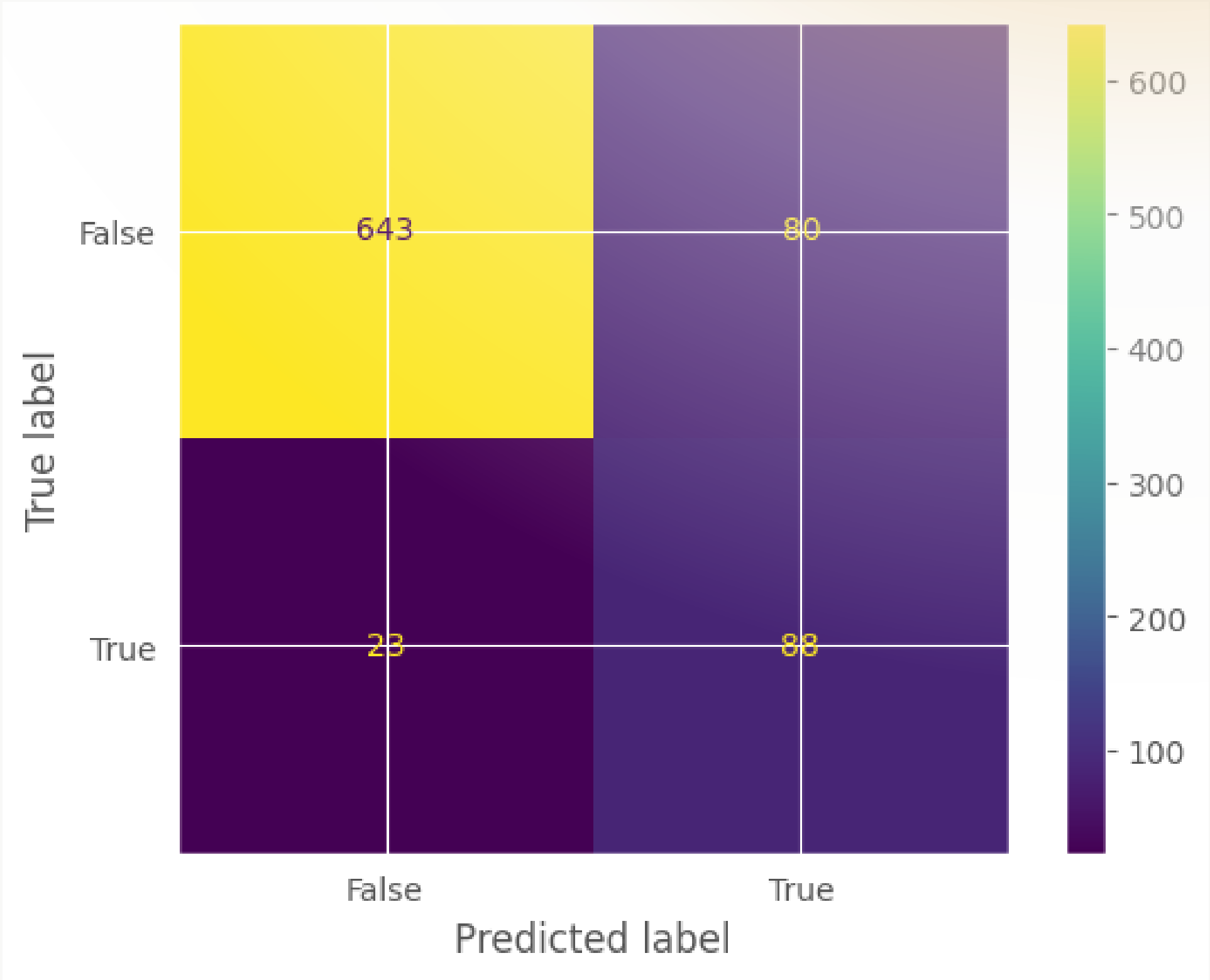
Model 5: Hyperparameter Tuning of RandomForest Classifier Model

There is a 1% increase in recall. Despite the model leveraging substantial computational power, its overall performance is subpar.
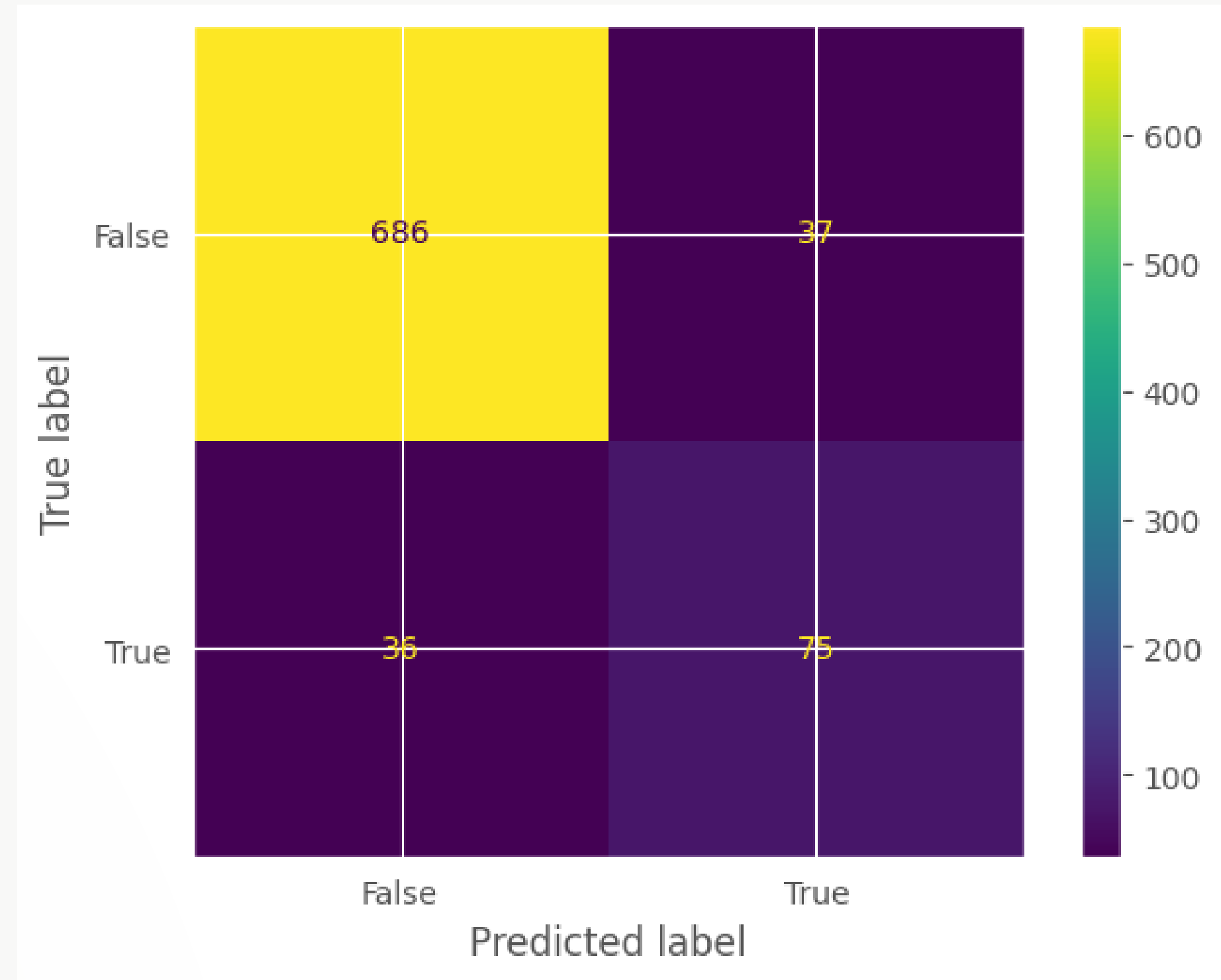
Conclusions

Key features contributing to churn prediction include:

Total Day Minutes: The overall duration of customer calls during the day.

Total Evening Minutes: The cumulative duration of customer calls during the evening.

Customer Service Calls: The number of calls made by the customer to customer service.

Total International Minutes: The total minutes spent by the user in international calls.

Recommendations

- **Higher call durations** correlate with lower churn likelihood, suggesting that the company should evaluate call charge rates compared to competitors and consider adjustments to prevent customer churn
- **Implementing a flat monthly fee** could offer customers a predictable and stress-free billing experience, aligning with natural human perception of time as either short or long
- This model aims to eliminate surprises for users and enhance overall satisfaction.
- Continuous monitoring and adaptation

Thank You