



# SyriaTel Customer Churn Prediction Phase 3 Final Project

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# Objectives

1. **Predict whether a customer is likely to discontinue their service with SyriaTel in the near future.**
2. **Identify actionable patterns to minimize revenue loss caused by customer churn.**

# Key Metrics

## Recall - does model predict churners?

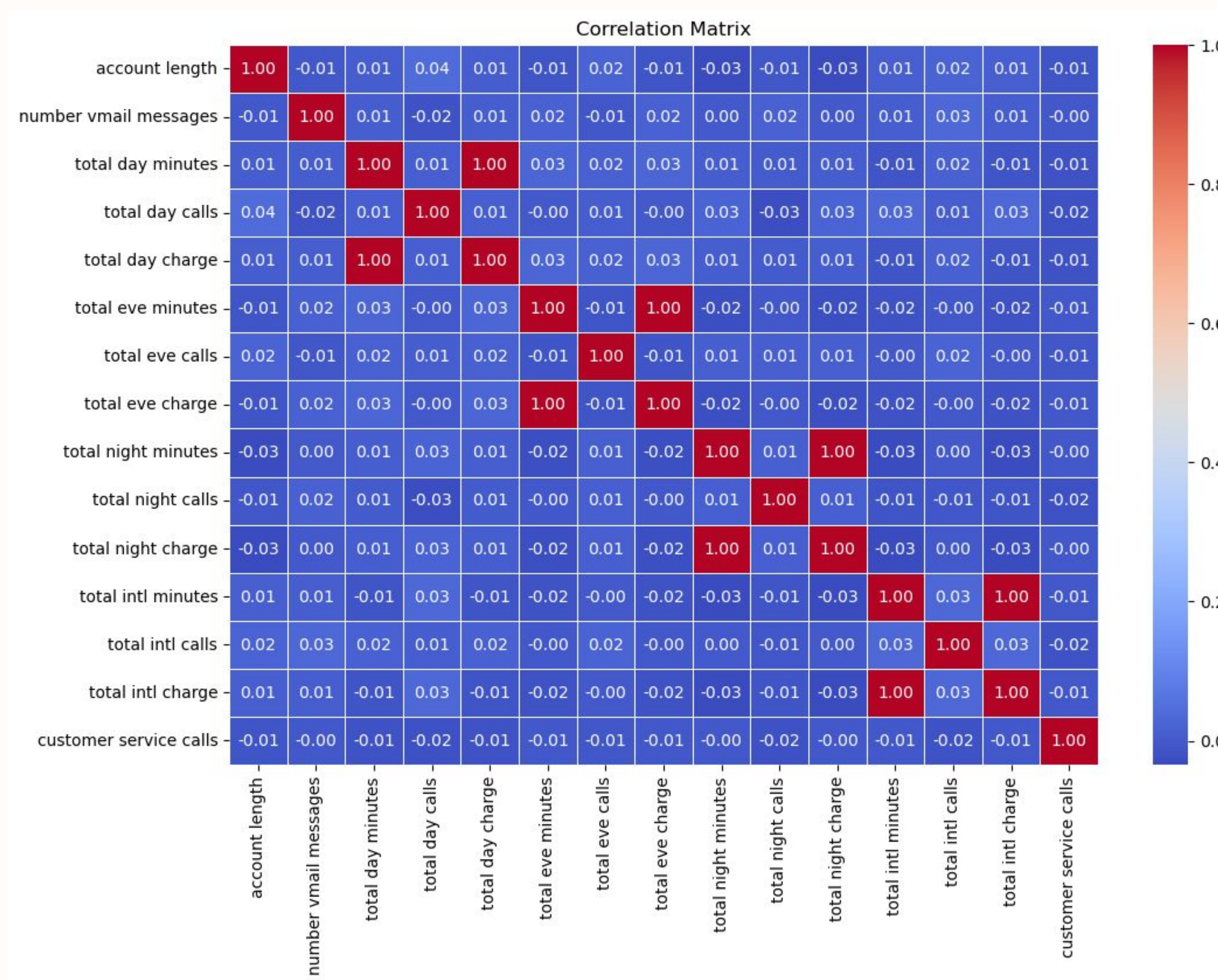
To identify potential churners and use strategies to prevent them from churning

## Precision - can model distinguish churner from non-churner?

To avoid overspending on non-churners

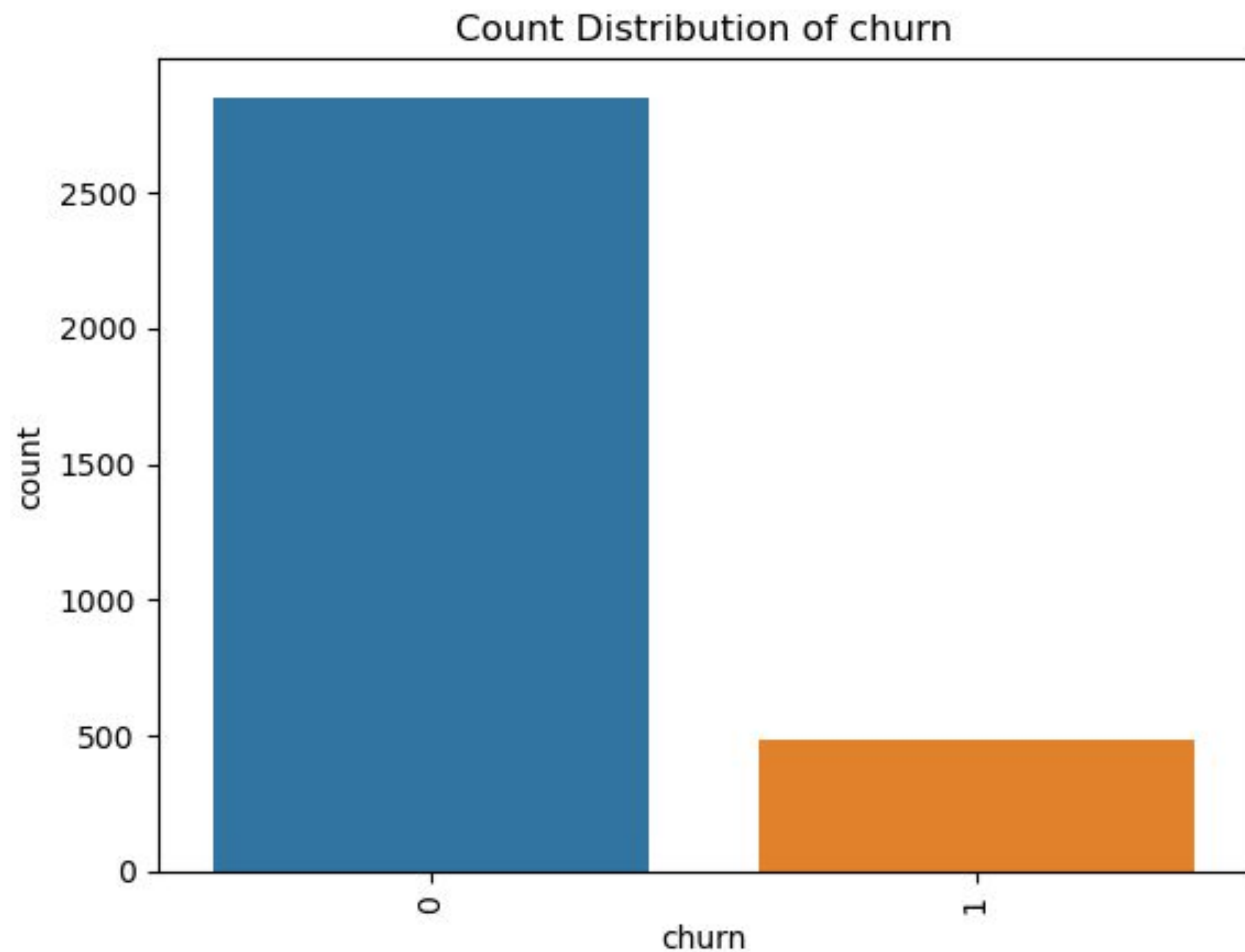
## AUC/ROC

To evaluate and compare overall performance of our models



There are many highly correlated fields in the dataset which makes sense because the more minutes you have, the higher your bill will be. Therefore, we will only use 1 of each of the correlated fields. We will keep:

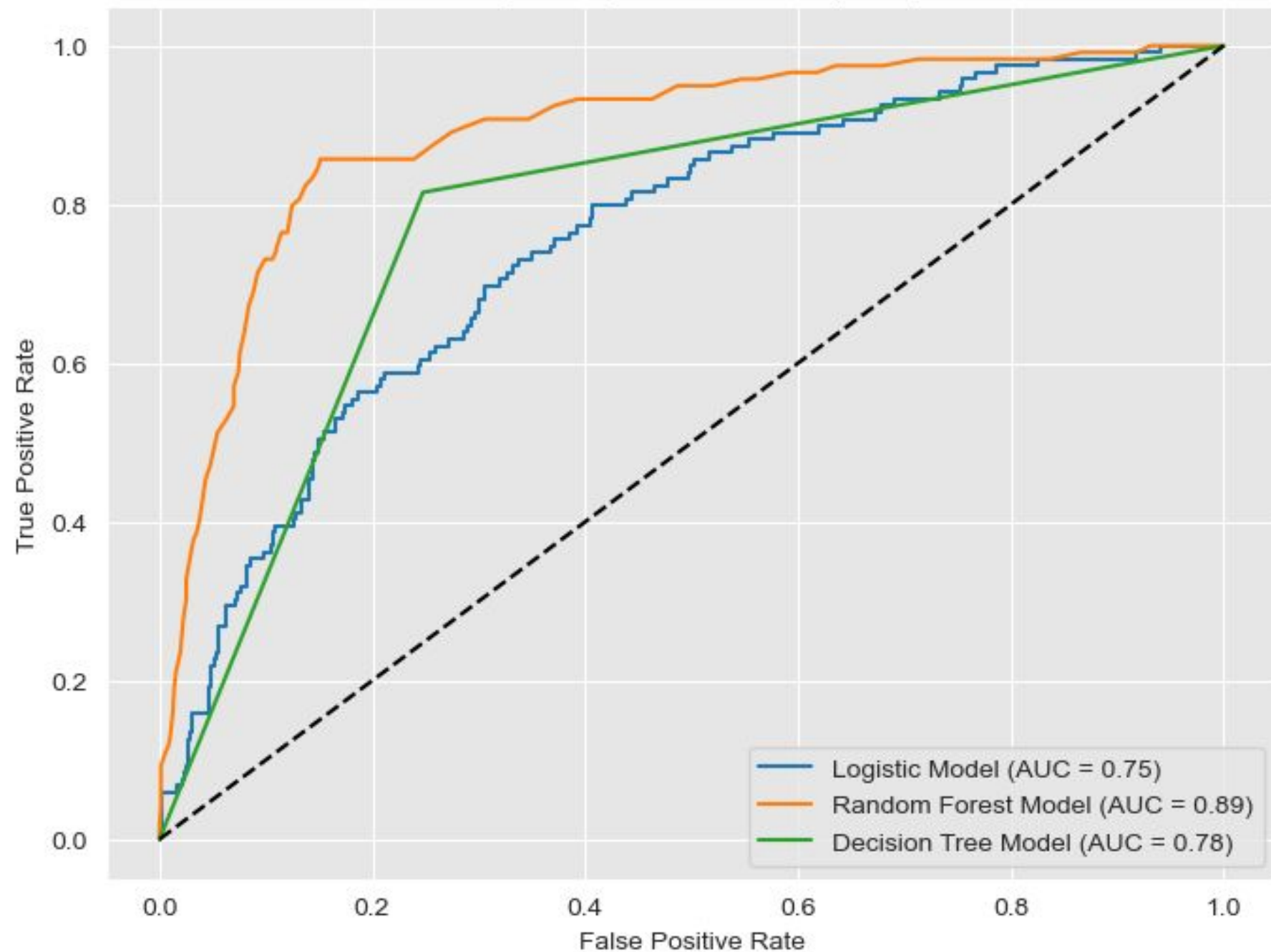
- voicemail plan
- total intl charge
- total night charge
- total eve charge
- total day charge





# Model Comparison

Receiver Operating Characteristic (ROC) Curves



## Logistic Regression - Model 1

Logistic regression is a simple model that predicts whether something will happen based on patterns in the data. It's quick to use and provides clear insights about which factors are important.

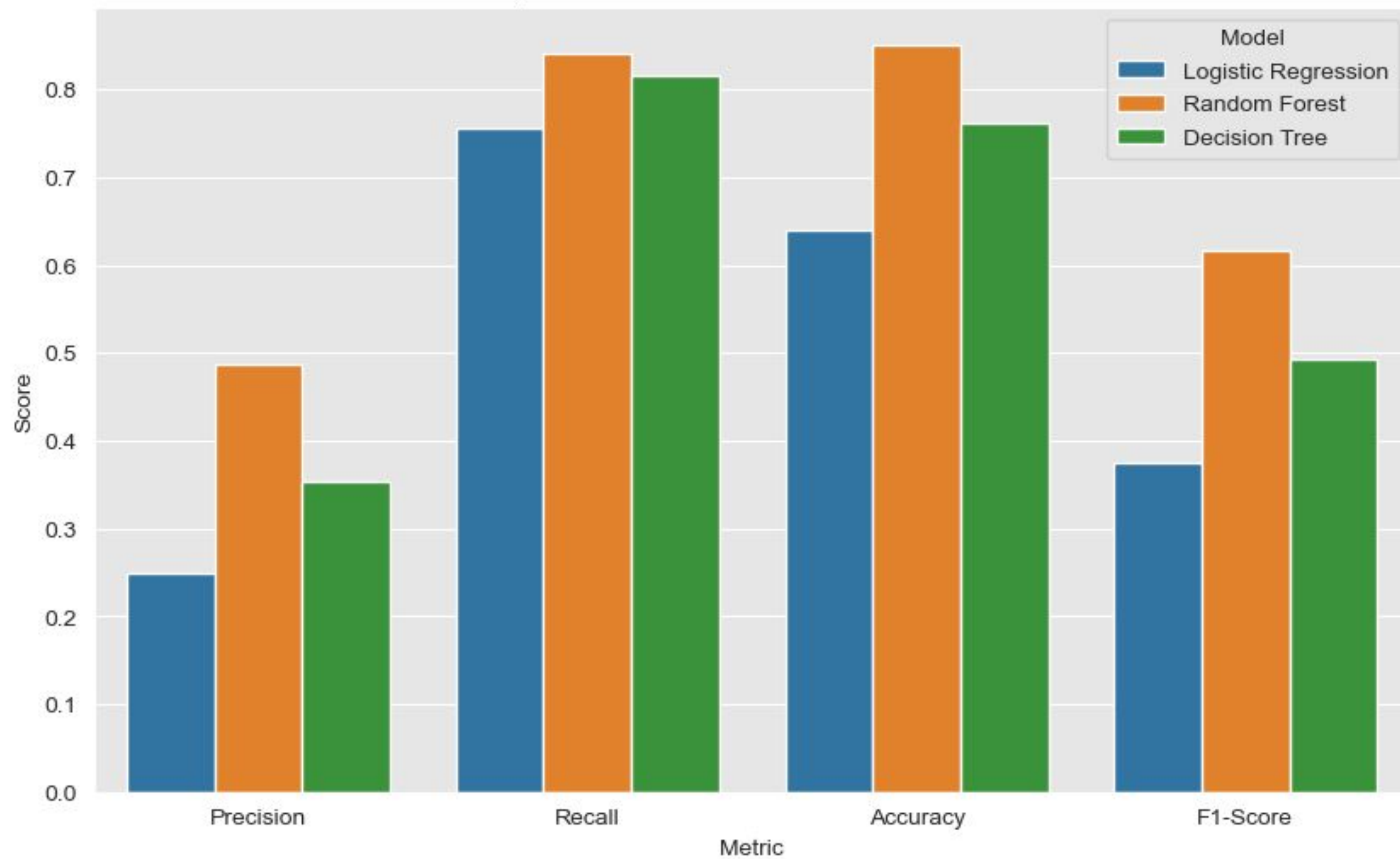
## Random Forest - Model 2

Random forest uses multiple decision trees to make better predictions. It's good at handling complex data and reduces the chance of making mistakes by combining results from many trees.

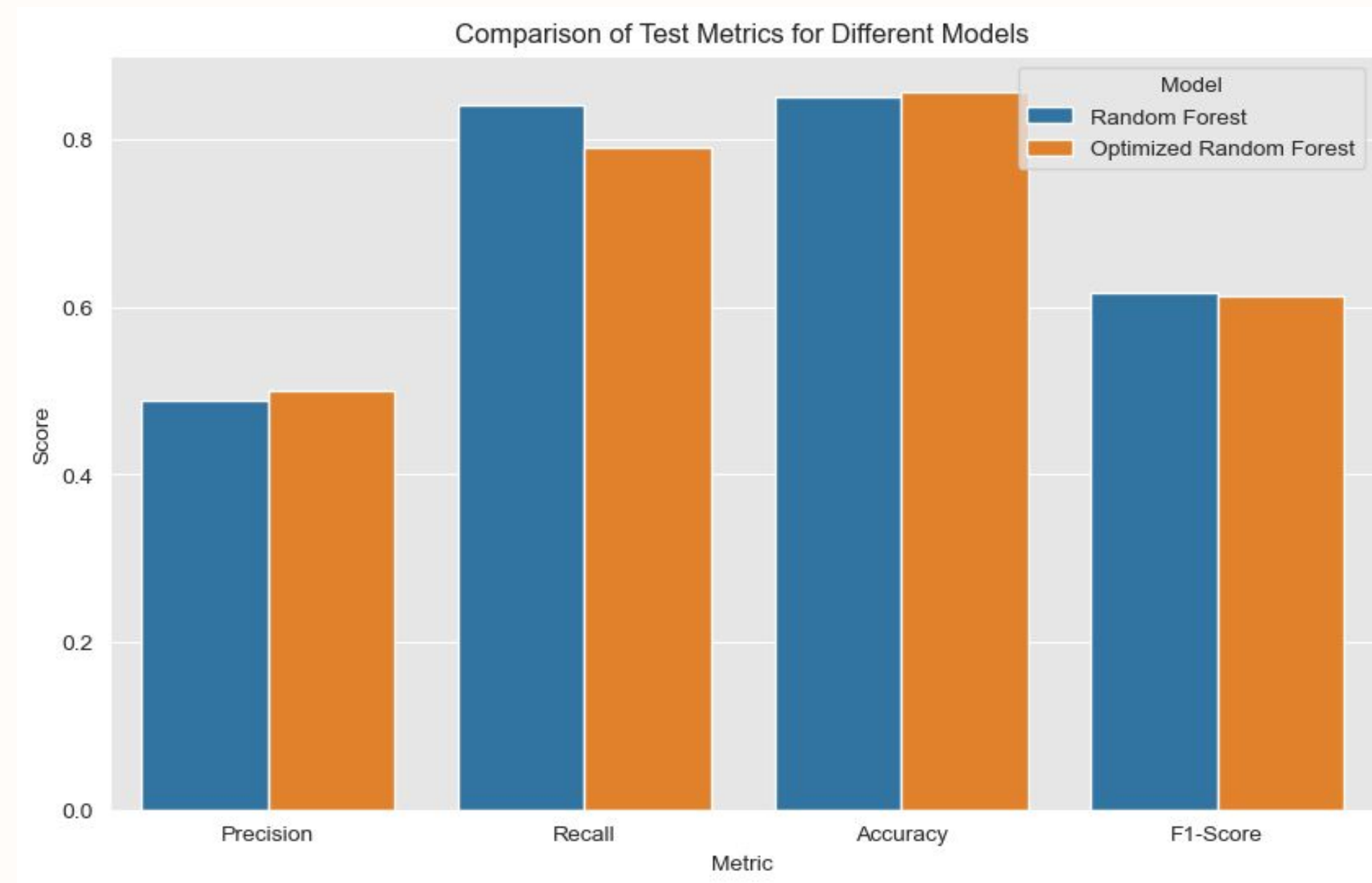
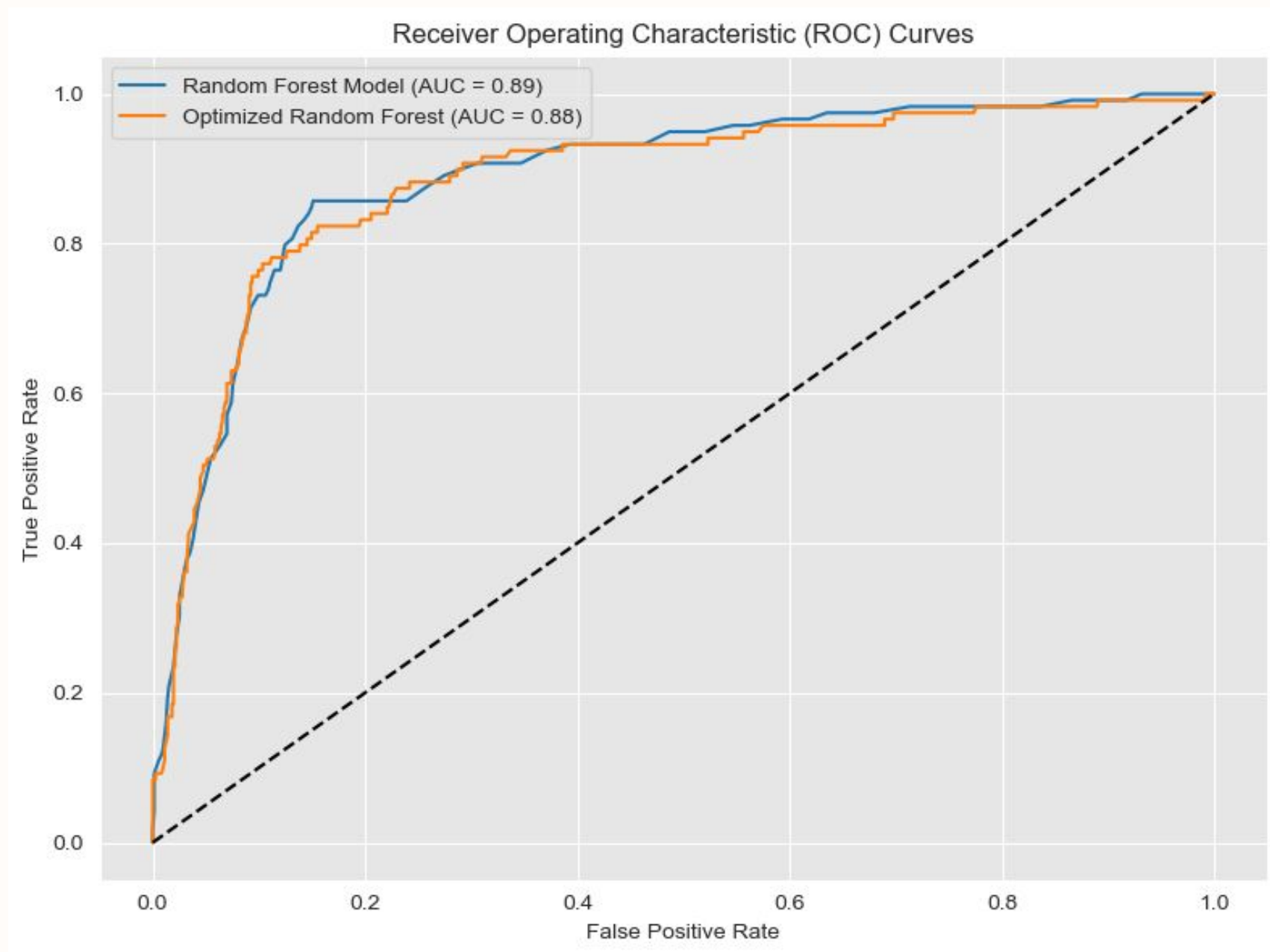
## Decision Tree- Model 3

A decision tree works like a flowchart, splitting data into branches to make predictions. It's easy to understand but can sometimes oversimplify or overcomplicate results.

Comparison of Test Metrics for Different Models



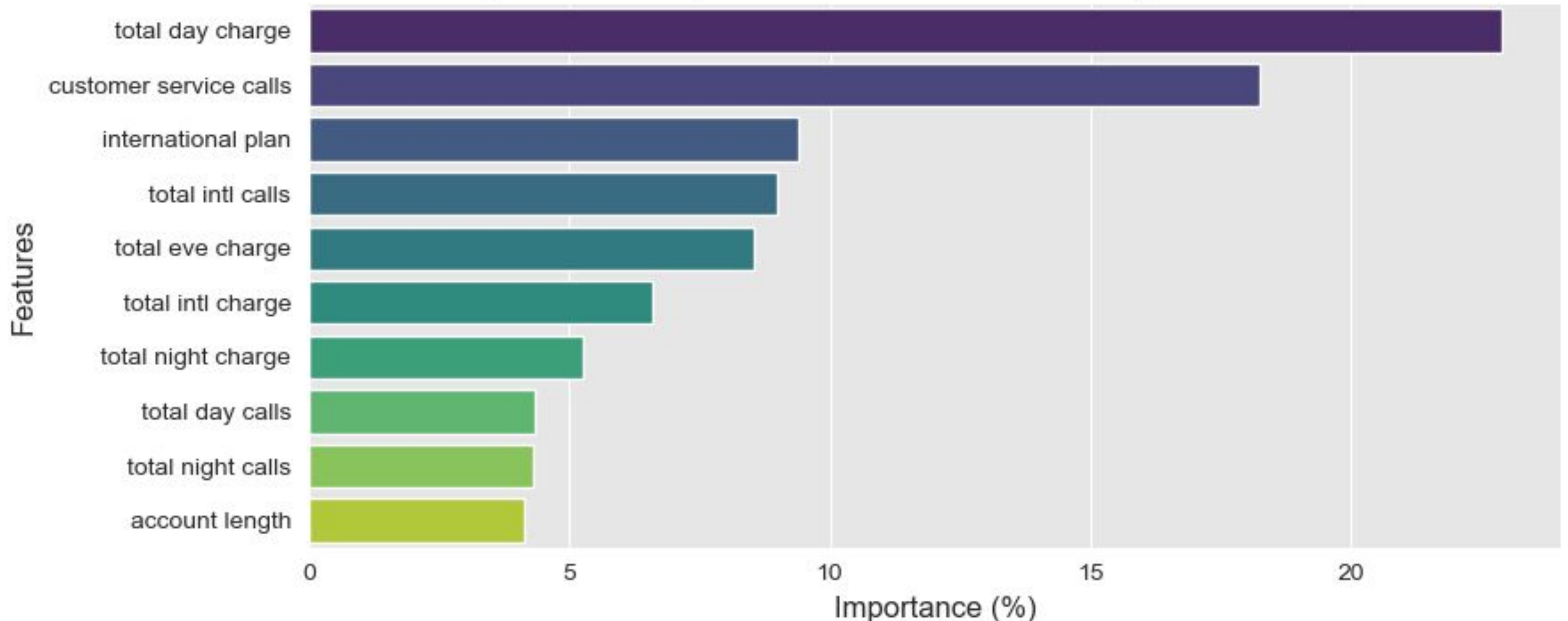
# Improving Random Forest using Hyperparameter Tuning



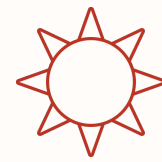


# Feature Importance

Top 10 Most Important Variables in Predicting Customer Churn



# Recommendations



**Address Concerns Related to Customer Service Calls**



**Tailor Offers for High Spending Customers**



**Incentivize and Simplify International Plans**