



PREDICTING CUSTOMER CHURN: SYRIATEL TELECOM COMPANY

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Introduction

Business Problem

Syriatel Telecom Company is experiencing a high churn rate which is threatening the company's growth and profitability.

Data Understanding

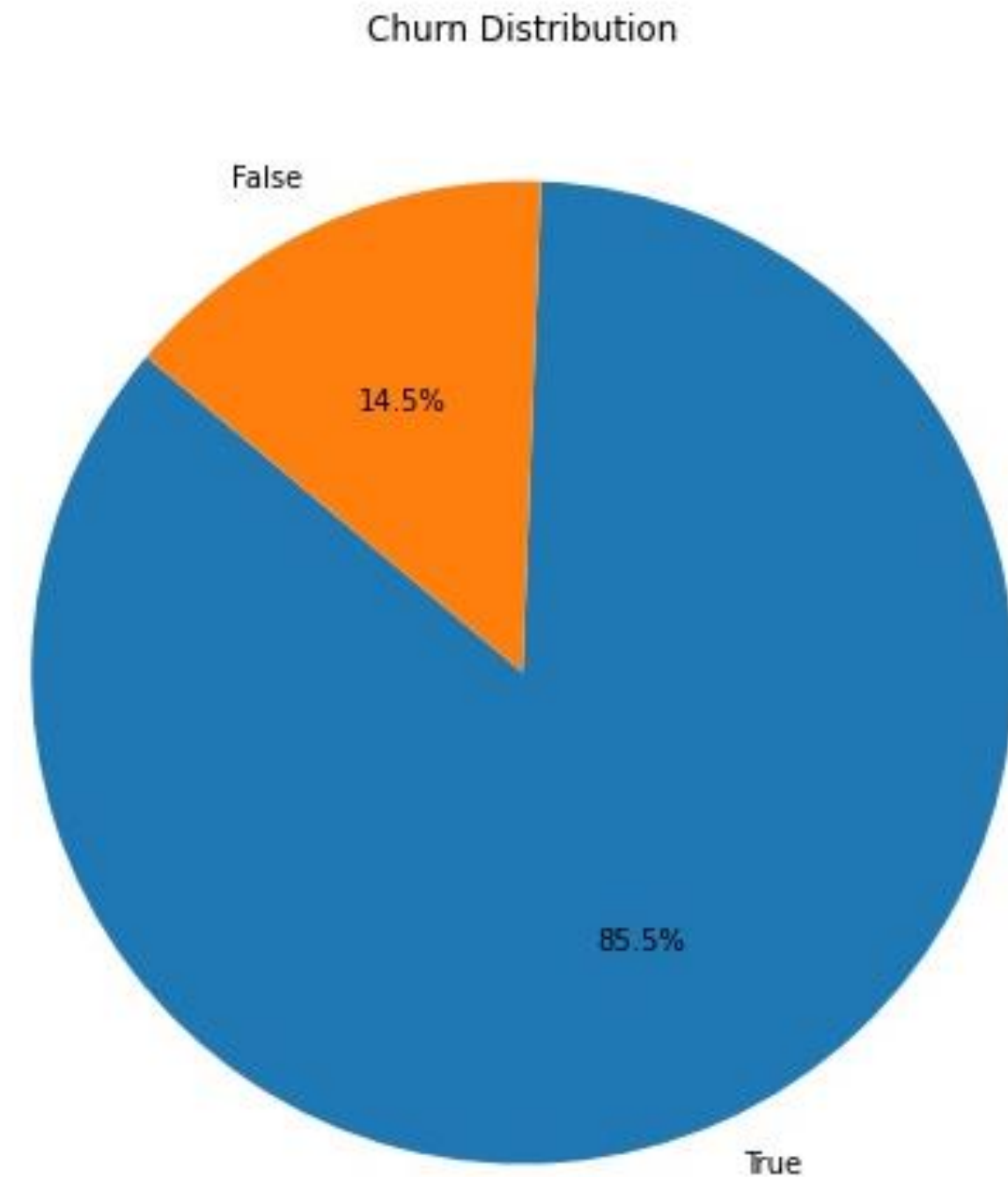
Data analyzed in the project was obtained from Kaggle and contained 19 features and 3333 entries.

Objectives

- Develop multiple machine learning models to for predicting customer churn by analyzing the key features within the data provided.
- Determine the best model using classification metrics and identify the key factors contributing to customer churn within the company.
- Propose cost-effective strategies that the primary stakeholder, SyriaTel, can implement to help retain its customers thereby reducing losses.

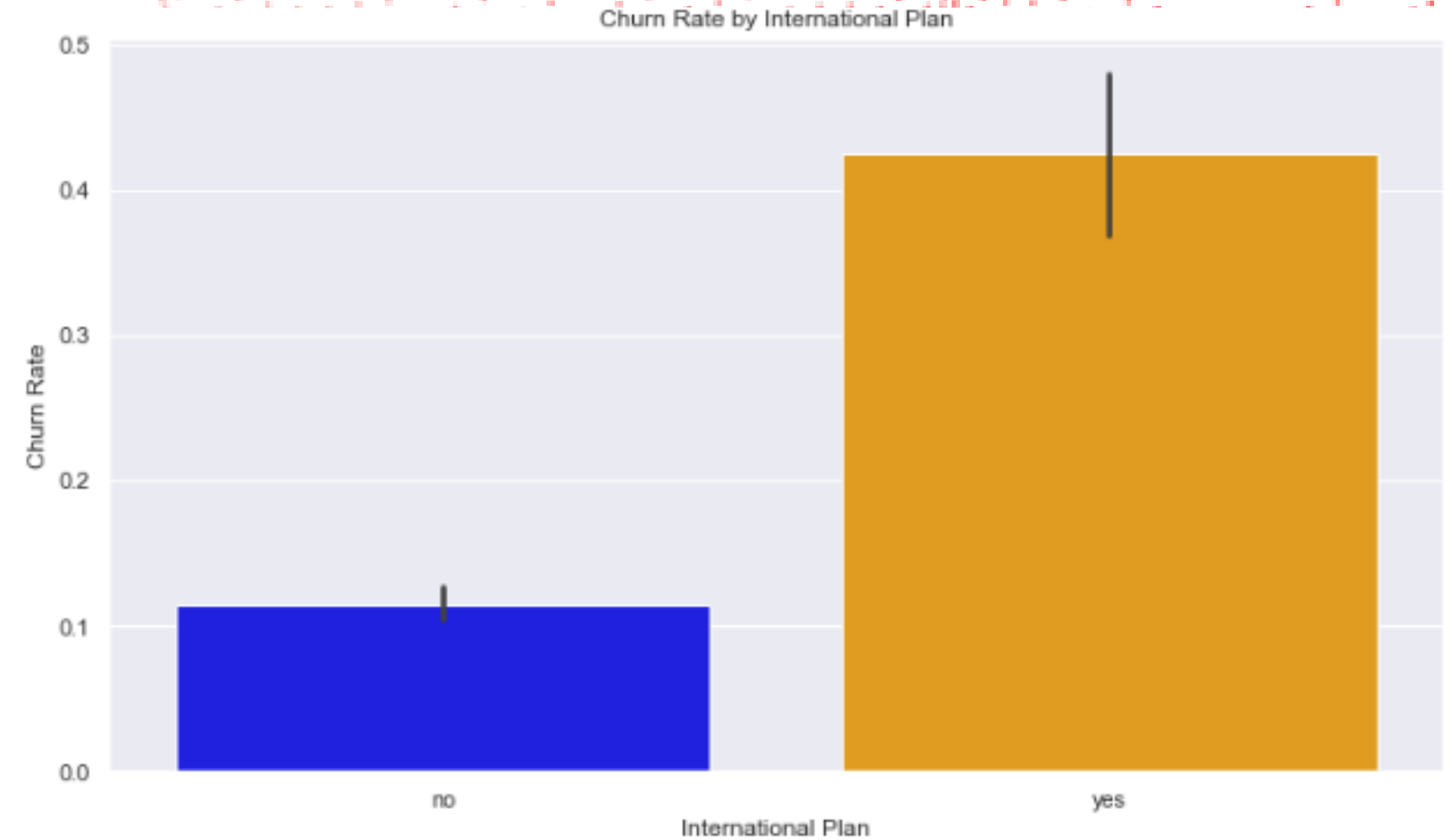
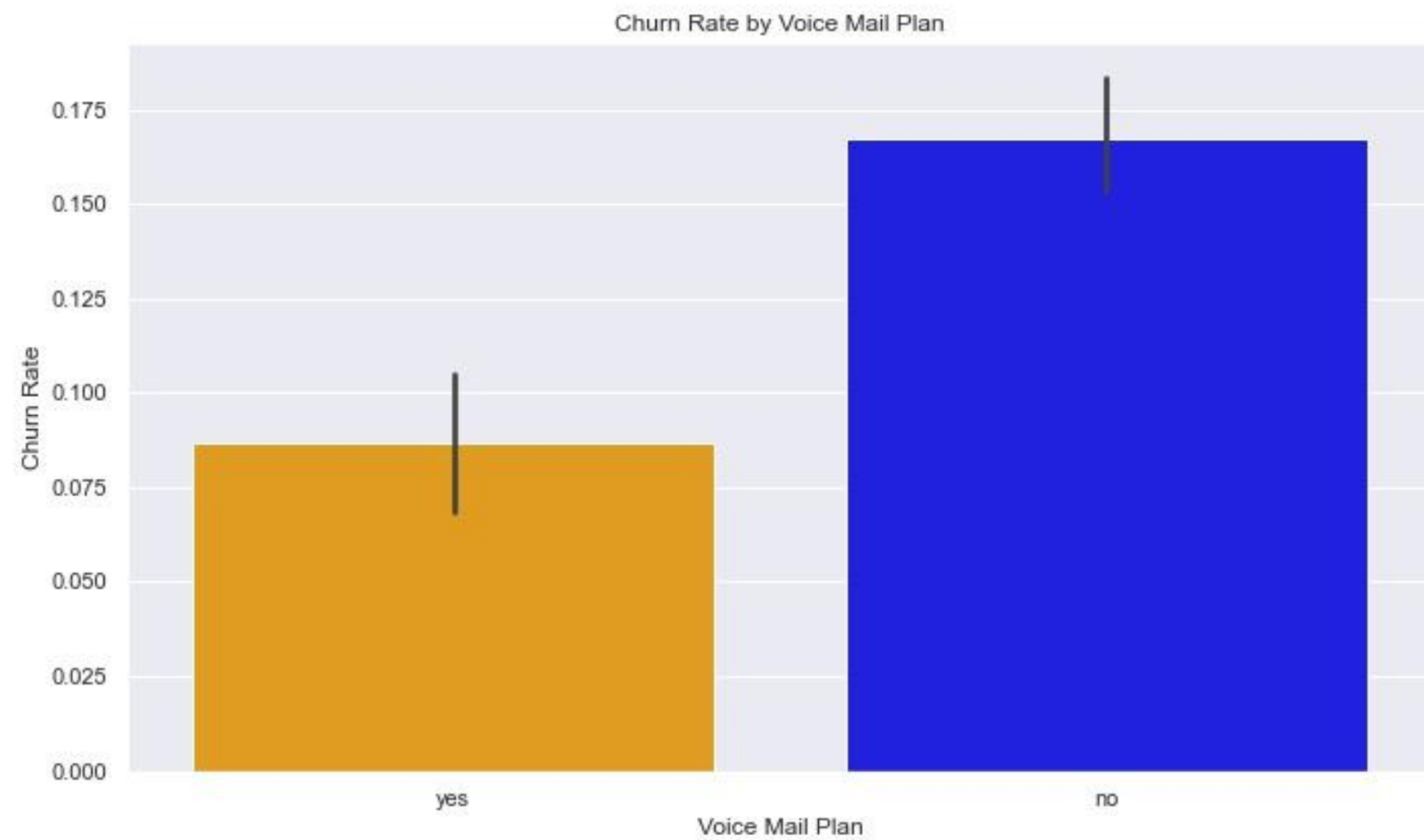
Exploratory Data Analysis

The target variable in this case was the churn column. EDA revealed that 85.5% of the customers in the data did not churn while 14.5% churned.



Exploratory Data Analysis

The following are plots showing churn rates by Voice Mail plan and international plan



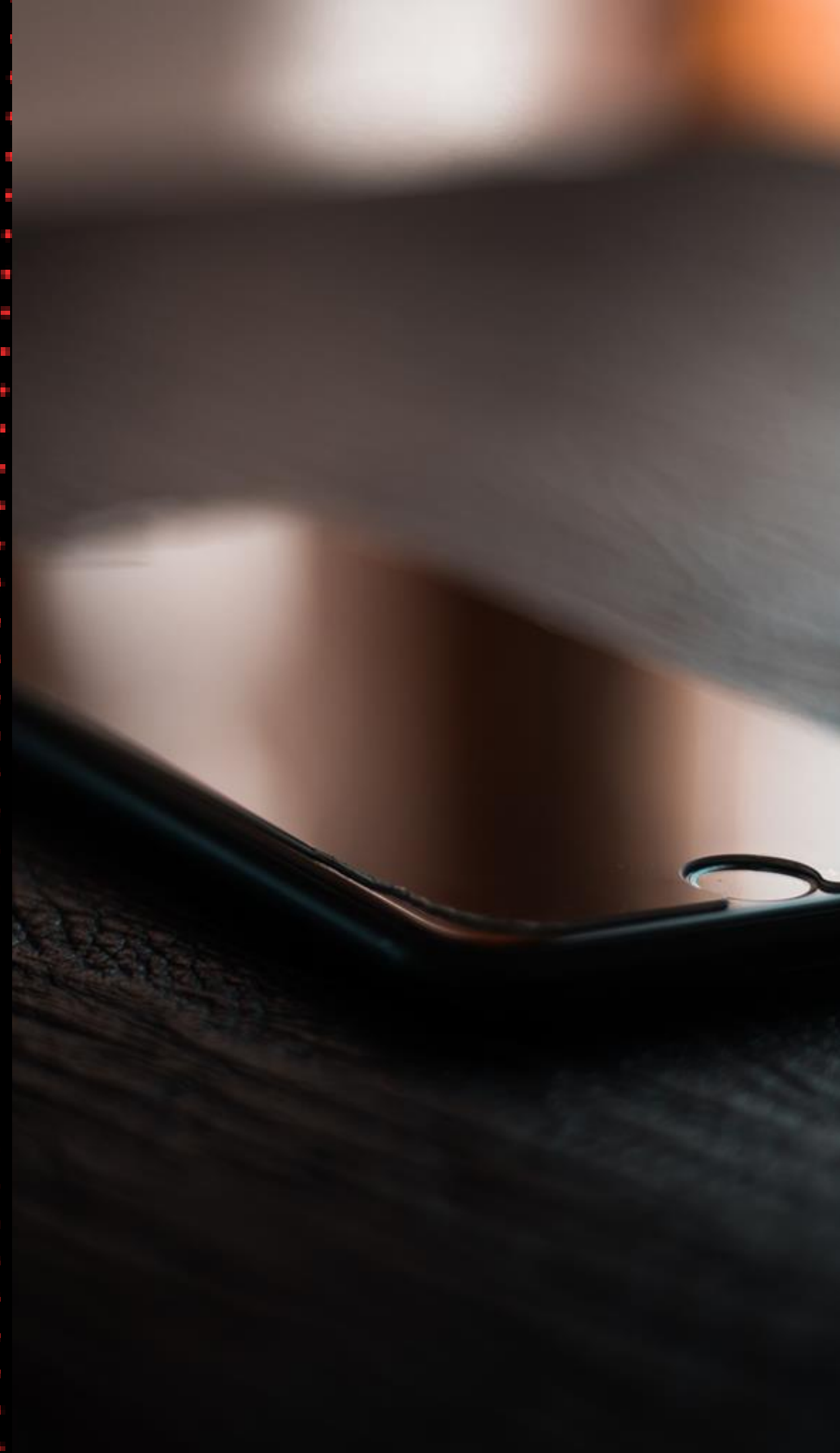
Customers with International plans appear to churn a lot more than those who do not

Modeling

The models employed and analyzed within the project were:

- Logistic Regression
- Decision Tree Classifiers
- Ensemble Method: Random Forest

It is worth noting that both the Decision Tree and Random Forest models underwent a rigorous process of hyperparameter tuning to identify and optimize the most effective hyperparameters for their respective tasks.



Results and Findings

The table below shows the scores of the classification metrics used to analyze the models. The best model in overall performance is the Random Forest model

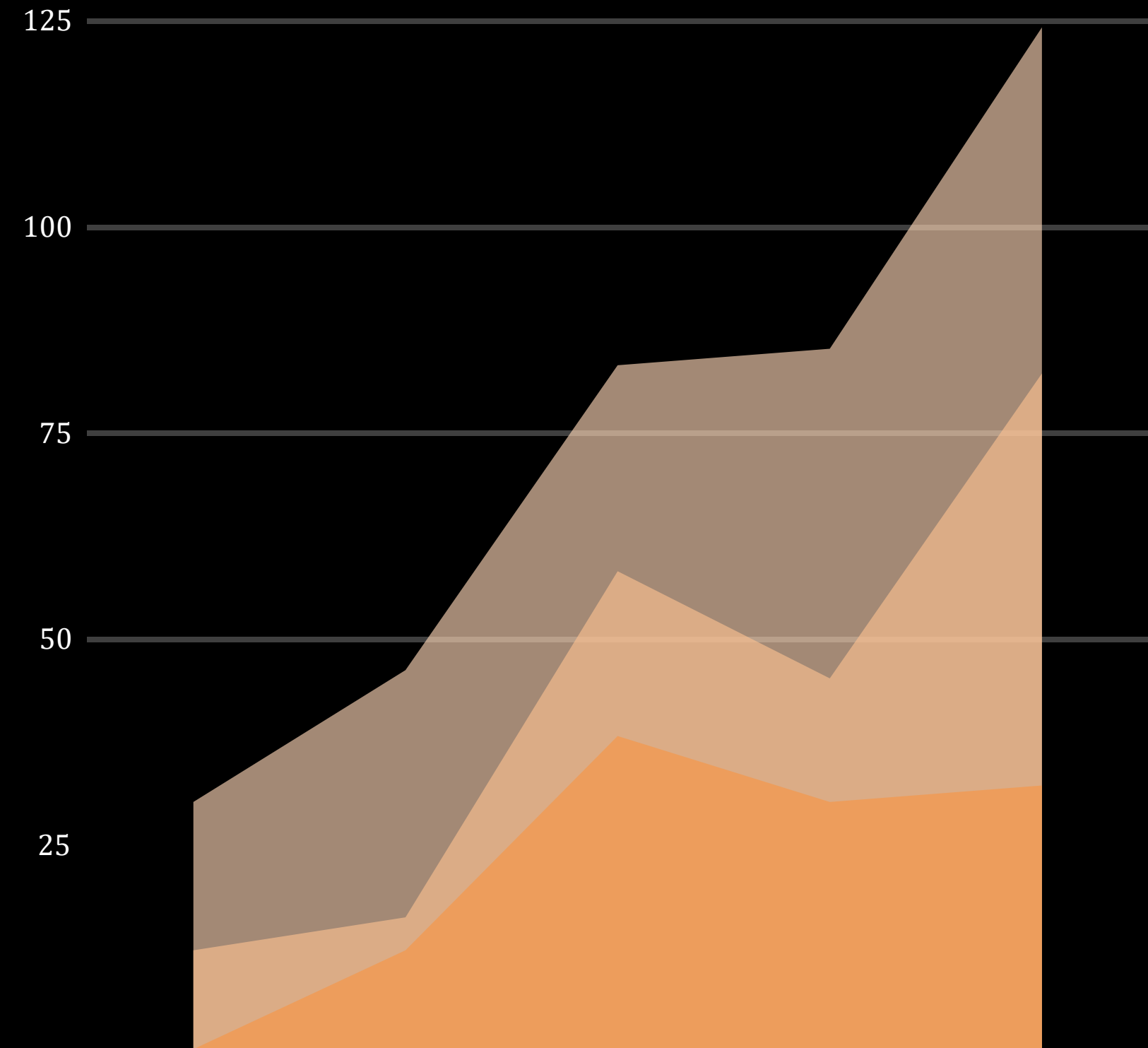
	Class	Logistic Regression	Decision Tree	DT Hyperparameter tuned	Random Forest	RF Hyperparameter tuned
Train Accuracy		77.4%	89.4%	95.0%	100.0%	95.2%
Test Accuracy		77.2%	93.1%	91.3%	94.2%	92.7%
Train AUC		83.9%	93.3%	98.8%	100.0%	99.6%
Test AUC		83.2%	89.4%	86.8%	92.0%	92.1%
Precision	0	95.0%	96.0%	96.0%	97.0%	97.0%
	1	38.0%	76.0%	71.0%	80.0%	73.0%
Recall	0	77.0%	96.0%	94.0%	96.0%	95.0%
	1	76.0%	79.0%	79.0%	81.0%	81.0%
F1-score	0	85.0%	87.0%	95.0%	97.0%	96.0%
	1	50.0%	93.0%	75.0%	81.0%	77.0%

* Class 0 stands for Not Churned while Class 1 stands for Churned

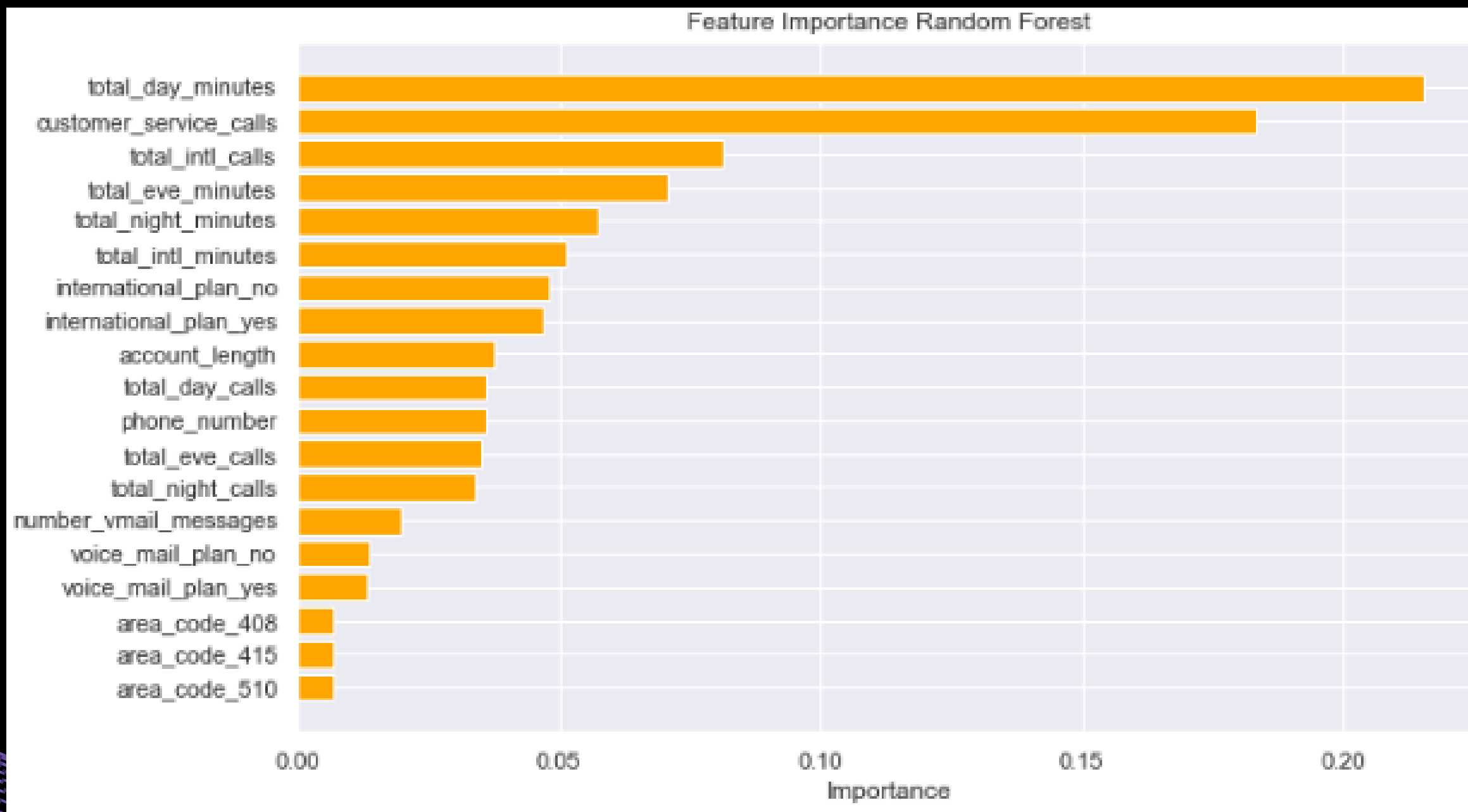
Why Random Forest?

From the summary of classification metrics we see that the Random Forest model performs much better than the rest. Some of the reasons why are:

- **Reduction of Overfitting:** Random Forest mitigates overfitting, by combining multiple decision trees and averaging their predictions.
- **Improved Generalization:** The combination of multiple decision trees in a Random Forest reduces the variance and enhances the model's ability to generalize to new, unseen data.
- **Feature Importance:** Random Forest provides a built-in mechanism to assess feature importance which can help in identifying the most relevant features for predicting churn.



Feature Importance



The top three features for predicting customer churn are:

- **Total Day Minutes**
- **Customer Service Calls**
- **International Plan**

Conclusion and Recommendations

- **Analyze Pricing and Improve Communication:** Conduct competitive pricing analysis, adapt to competitors, and ensure transparent communication to avoid pricing misunderstandings, especially for international services
- **Customer Service Improvement:** Enhance customer service for churn reduction with timely issue resolution and proactive surveys for satisfaction insights.
- **Optimize International Plan Options and Customer Retention Incentives:** The company should diversify international plans and implement customer retention strategies for long-term customer loyalty.
- **Continuous monitoring and evaluation :** Syriatel must monitor and measure each strategy's performance to identify and address issues, ensuring optimal results.

By implementing these proactive strategies, SyriaTel will be able to cultivate a loyal customer base and effectively reduce the rates of churn thus ensuring the success of the company in the telecom industry.

Thank
You

