Telecom Churn Prediction

A Binary Classification Machine Learning Project

Business Problem

- **Content:**

  - SyriaTel is losing customers (churn)

- Objective:

  - Predict if a customer is likely to churn

- Importance:

  - Proactive retention - cost savings

Project Goal

- Predict customers likely to churn.
- Identify top factors influencing churn
- Enable proactive retention strategies

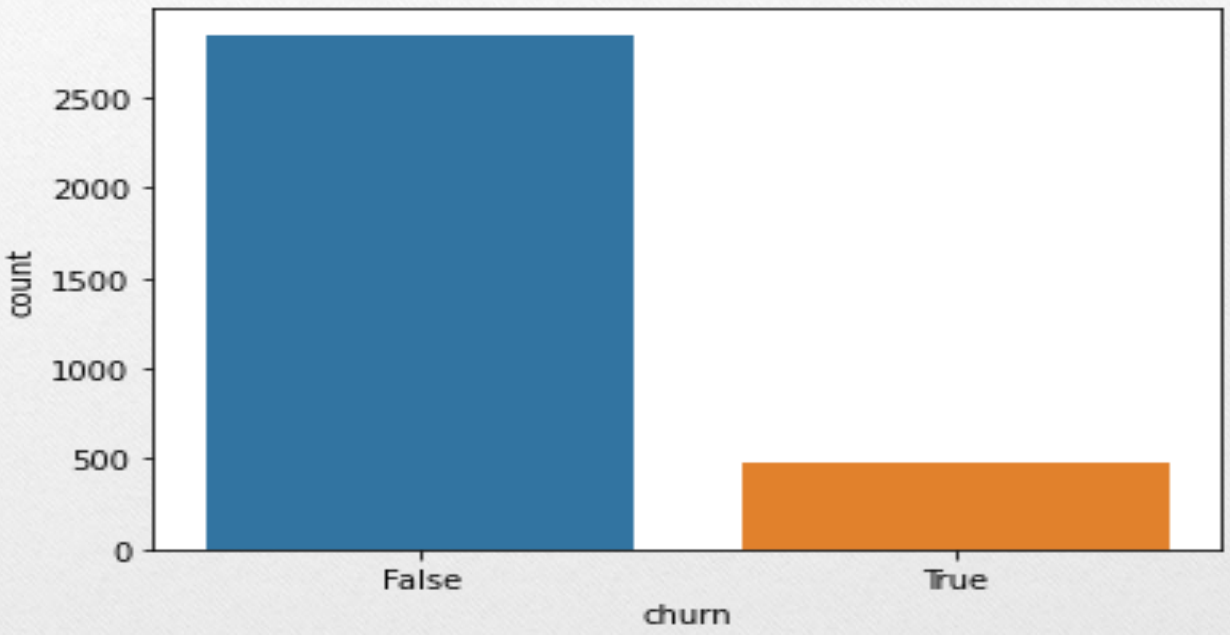
Data Overview

- Dataset: SyriaTel (3,333 customers)
- Features:
  - Numeric: Call durations, charges, service calls
  - Categorical: State, Area code, Plans
- Target: Churn (Yes/No)

Key Insights from EDA

- Churn Rate: 14.5% (imbalanced data)
- Customers with International Plan churn more
- More service calls = higher churn risk
- Heavy imbalance in area code distribution (415 dominates)

Visual: Bar plots



Data Preprocessing

- **Content:**

❖ One-hot encoding

❖ Missing values filled (if any)

❖ Features scaled

❖ Dataset split: 70% training, 30% testing

Modeling Approach

- 3 Models Tested:

✓ Logistic Regression,

✓ Decision Tree,

✓ Random Forest

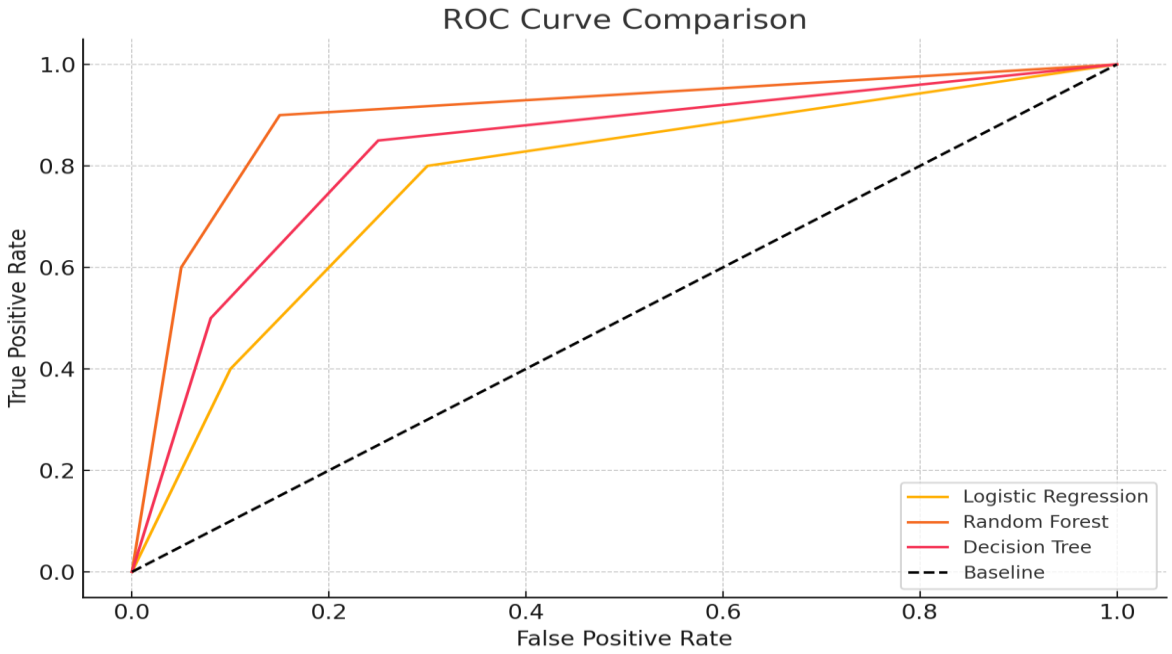
- Addressed imbalance using SMOTE
- Evaluated on Accuracy, Recall, AUC, Precision

Model Comparison

- Logistic Regression: Accuracy=0.88, Recall=0.32, ROC-AUC=0.79
- Decision Tree: Accuracy=0.90, Recall=0.64, ROC-AUC=0.82
- Random Forest: Accuracy=0.93, Recall=0.64, ROC-AUC=0.88

✓ Best Model: **Random Forest**

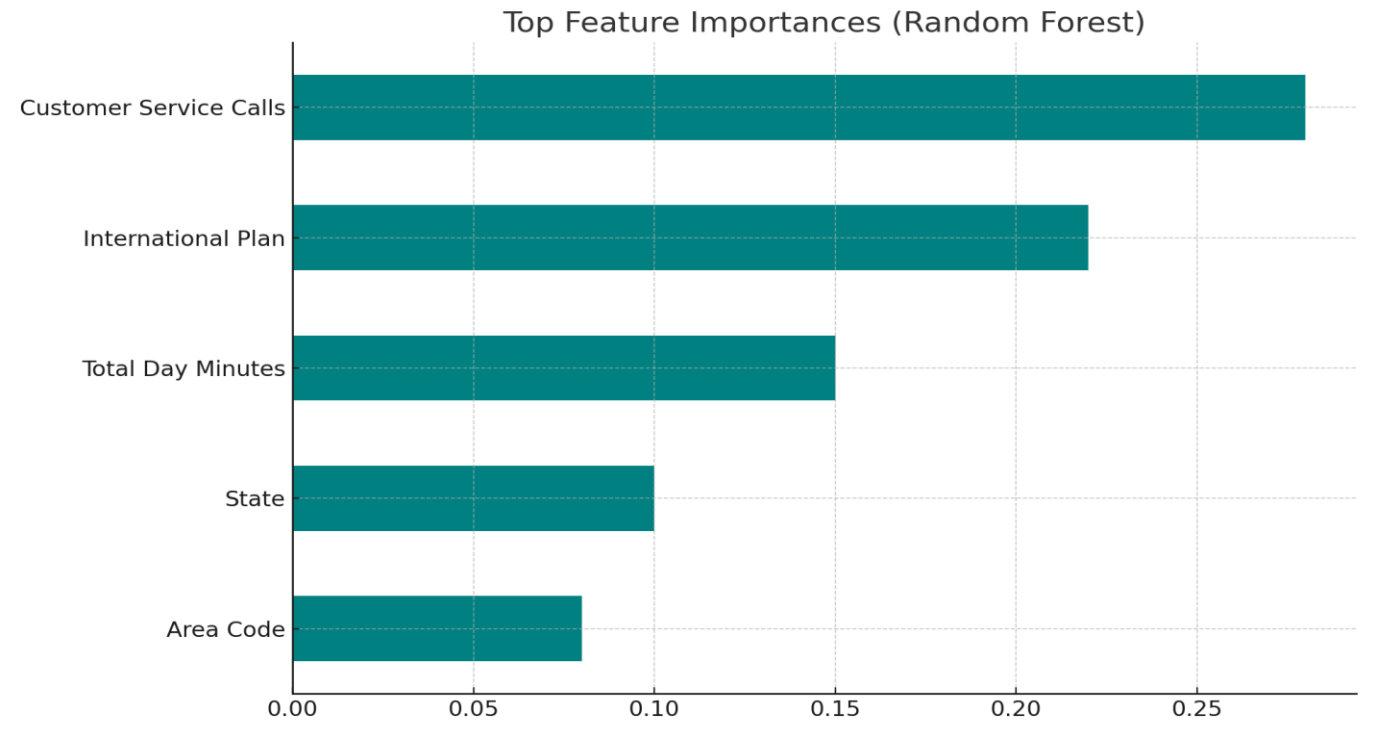
Best Model


ROC Curve Comparison
True Positive Rate
False Positive Rate
0.0
0.2
0.4
0.6
0.8
1.0
Logistic Regression
Random Forest
Decision Tree
Baseline

Top Churn Drivers

- ✓ Customer Service Calls (High dissatisfaction)
- ✓ International Plan
- ✓ Daytime Minutes
- ✓ State & Area Code

Top Churners



Business Recommendations

- ✓ Proactively reach out to customers with frequent service calls
- ✓ Review International Plan pricing & support
- ✓ Implement loyalty offers for high-usage customers
- ✓ Regional strategies for area code 415

Conclusion & Next Steps

- ✓ Random Forest deployed as the best model
- ✓ Enables data-driven retention campaigns
- ✓ Future Enhancements:
  - ➢ Deploy prediction dashboard
  - ➢ Continuous model monitoring

Q&A / Thank You