Customer Churn Analysis for SyriaTel

Overview

PROBLEM: TELECOM COMPANIES LIKE SYRIATEL ARE IMPACTED BY CUSTOMER CHURN.

IMPACT: CHURN LEADS TO REVENUE LOSS, HIGHER ACQUISITION COSTS, AND DAMAGED BRAND REPUTATION.

GOAL: PREDICT CHURN PATTERNS TO IMPROVE RETENTION, BOOST PROFITS, AND GROW MARKET SHARE.

Business Objective

Build predictive models to identify churn-prone customers.

Make data-driven decisions to reduce churn.

Strengthen customer loyalty and company profitability.

Data Summary

Source: SyriaTel Churn Dataset

Rows: ~3,000 customer records

Key Features: Usage minutes, customer service calls, international/voicemail plans, charges

Target Variable: Churn (Yes/No)

Key Insights from Data

- Customers with **international plans** churn more.
- High **daytime charges** and **customer service calls** increase churn risk.
- **Voicemail plan** users are less likely to churn.
- Some features like **night minutes** or **account length** are weak predictors.

Modeling Approach

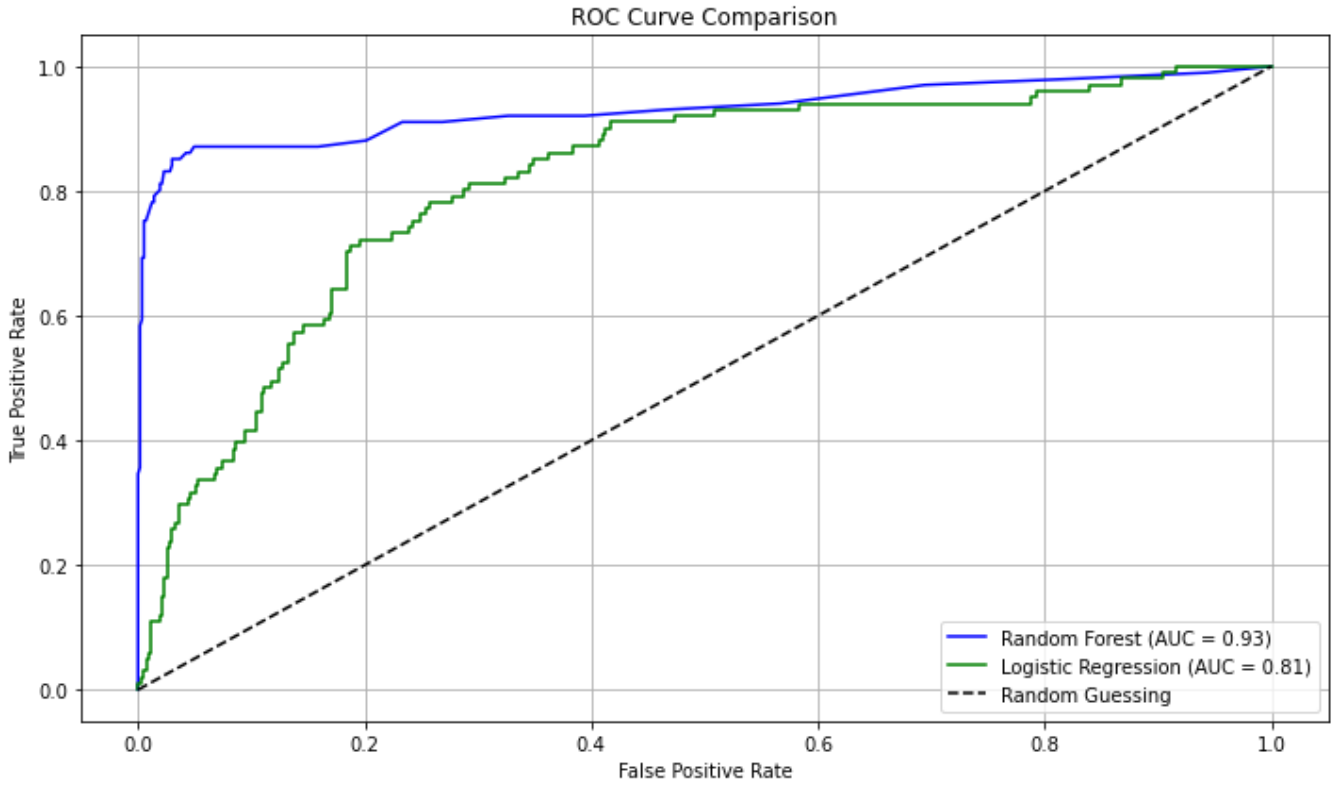
- Built three models:
- **Logistic Regression** (Baseline)
- **Decision Tree**
- **Random Forest** (Best Performer)
- Addressed data imbalance using class_weight='balanced'
- Evaluated using accuracy, precision, recall, and ROC AUC

Model Performance Summary

Model	Accuracy	Precision (Churn)	Recall (Churn)	AUC
Logistic	75%	35%	75%	0.81
Decision Tree	92%	76%	72%	0.87
Random Forest	**95%**	**96%**	**69%**	**0.93**

ROC CURVE

- The random forest curve is more to the left(closer to the y axis) thus depicting a better model.
- The Random forest is the better model here basing on the AUC(Area Under the Curve)
- Random forest has an AUC of 0.93 compared to logistic regression which has 0.81



Feature Importance (Top Drivers of Churn)

- **Customer service calls** (most important)
- **Total day charge/minutes**
- **International plan**
- Less important:
- Voicemail plan
- Account length

Key Conclusions

Churn is **predictable** using call and plan data.

Random Forest provides the most accurate and reliable predictions.

Customer dissatisfaction (calls), high bills, and international plans are red flags.

Recommendations

- **Improve Customer Service**
- Fast resolutions, better training, fewer callbacks.
- **Reevaluate International Plans**
- Reduce pricing or offer bundled deals.
- **Target High-Usage Customers**
- Offer loyalty perks or proactive support.
- **Use Churn Prediction Model**
- Focus retention offers on high-risk customers only.

Next Steps

Deploy Random Forest model to score all customers.

Train customer service team on retention flags.

Monitor churn monthly and iterate the model quarterly.

Thank You!

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