

# **Holding the Line: TelConnect battle against churn.**

Data Science Analysis and retention strategy optimization

*Monisha Patro*  
*monishaapatro@gmail.com*

# Introduction

## **TelConnect's Retention Challenge:**

- Increasing customer churn rates
- Rising retention costs (+45%)
- Reactive retention strategy
- Need for a proactive solution

# Business Problem & Objectives

## Key Questions:

- How can we proactively identify customers at risk of leaving?
- Is the current retention strategy (StreamFlix voucher) cost-effective?
- What alternative strategies can optimize retention efforts?

# Data Overview & Preprocessing

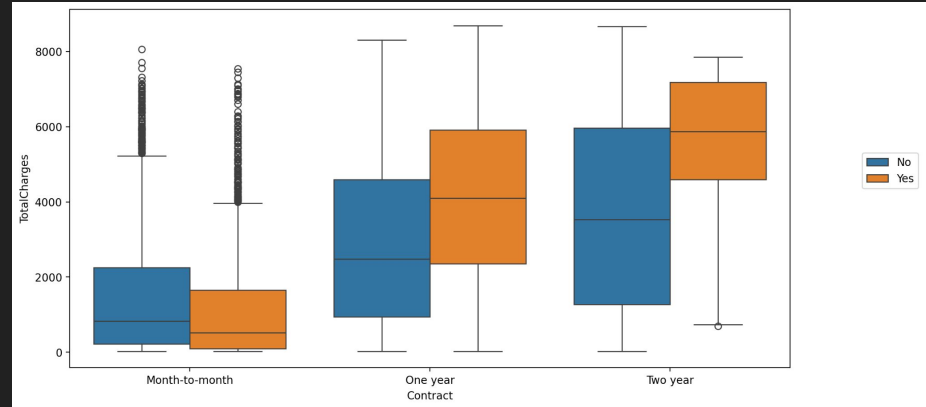
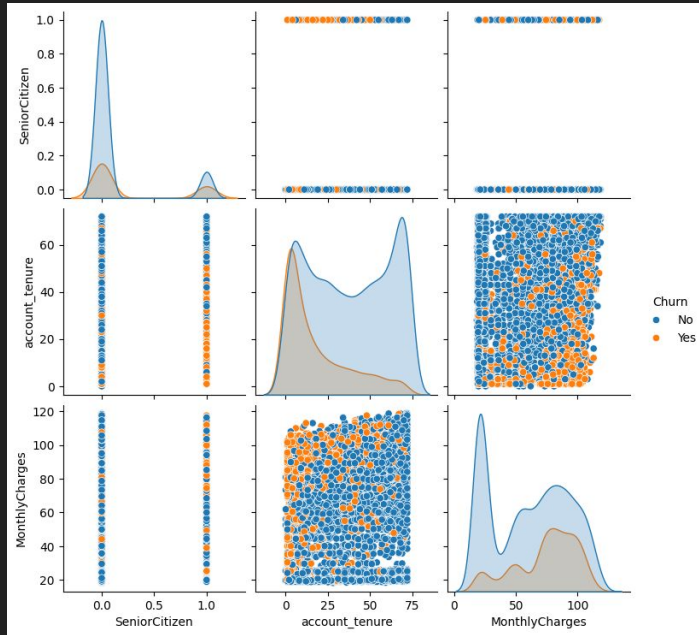
**Dataset: 7,043 customers with:**

- Demographics, Account Info, Service Subscriptions, Tenure, Churn Status

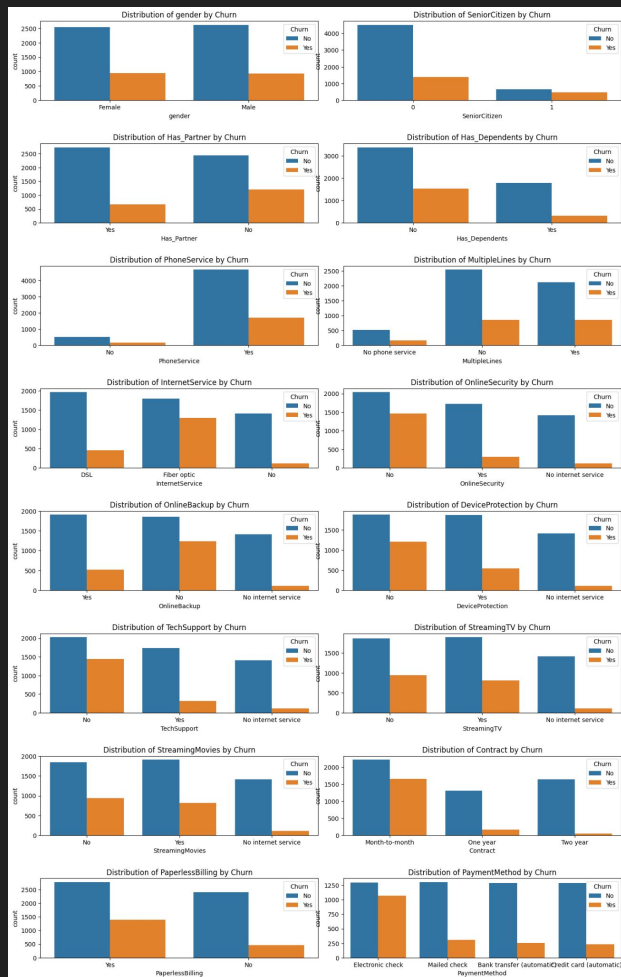
**Preprocessing Steps:**

- Handled missing values (median for numerical, mode for categorical)
- One-Hot Encoding for categorical variables
- Train-Test Split (80%-20%)

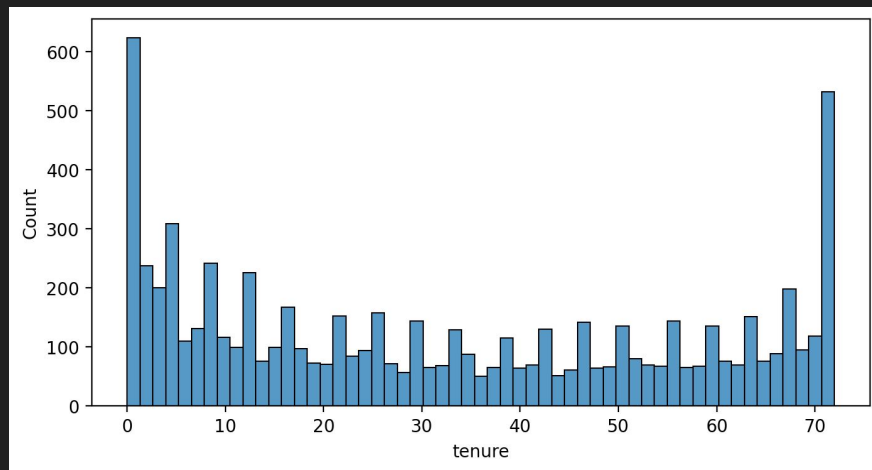
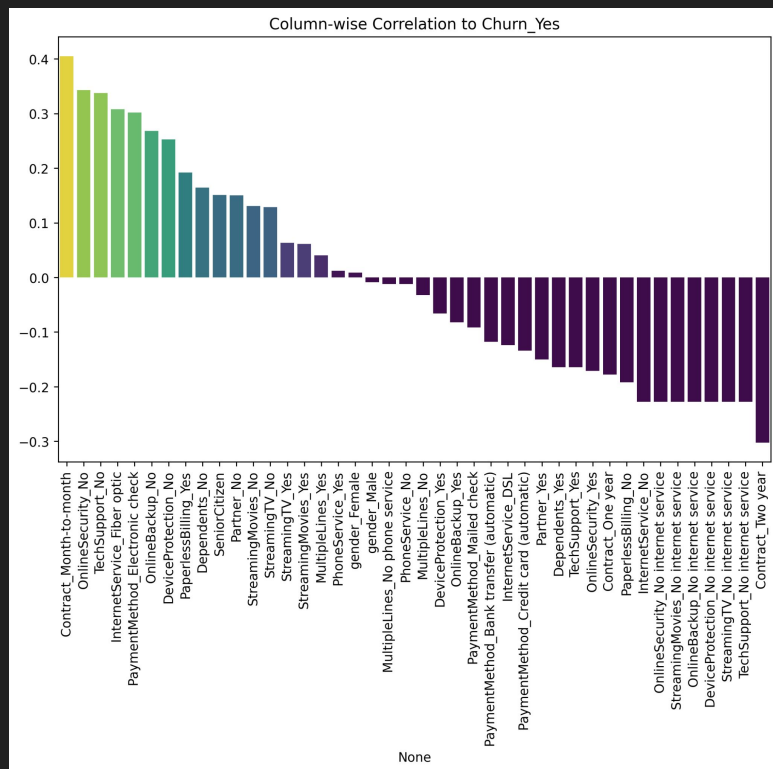
# Here are a few analyses from the provided historical data:



This plot visualizes relationships between key numerical variables and churn. We observe that churn is higher among customers with lower tenure and higher monthly charges.

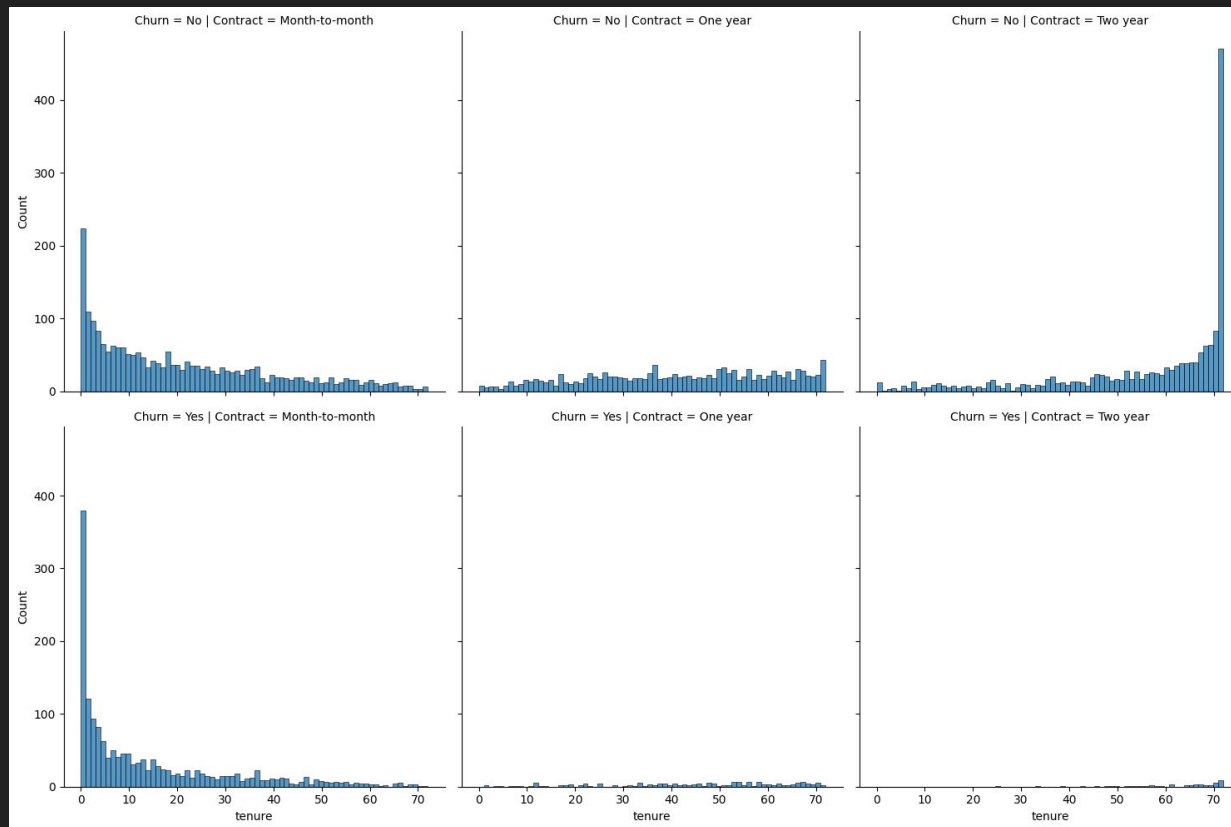


These charts show how different categorical variables (such as gender, contract type, and internet service) relate to churn. Month-to-month contracts and fiber optic internet users seem to have higher churn rates.



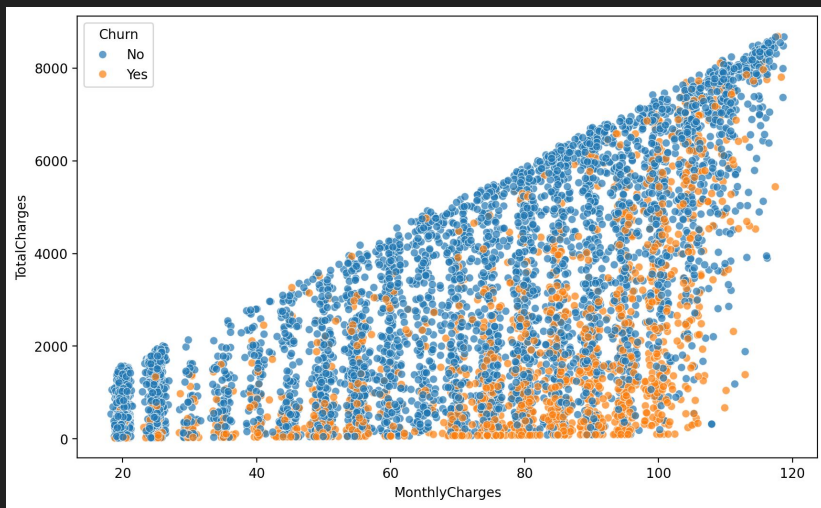
Many customers either have very short or very long tenures, with churn being more common in the lower tenure ranges.

The correlation plot reveals that month-to-month contracts have the strongest positive correlation with churn, while long-term contracts and tenure negatively correlate with churn.



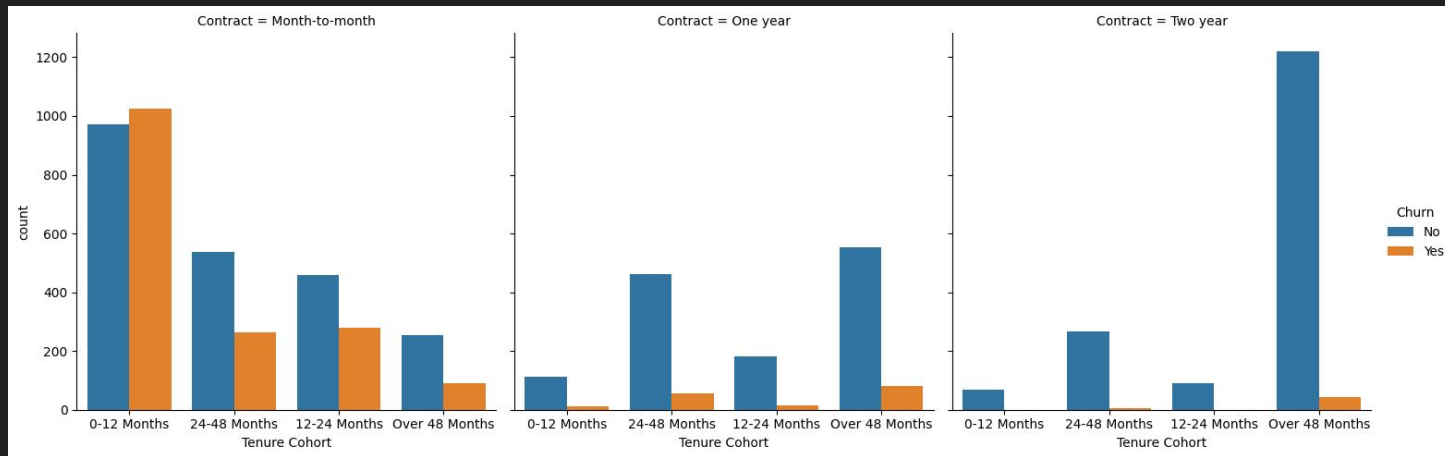
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Customers on month-to-month contracts with short tenure have the highest churn, reinforcing the importance of contract type in churn prediction.



# Model Selection

- Logistic Regression (Baseline model)
- Random Forest (Ensemble model)
- XGBoost (Boosting model)
- AdaBoost (Boosting model, better computational efficiency)

# Model Performance Comparison

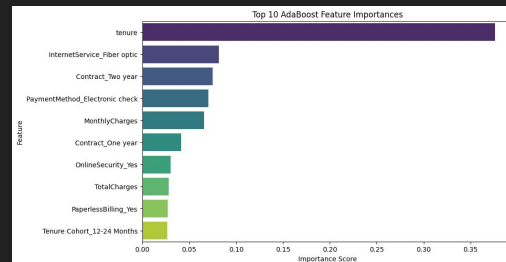
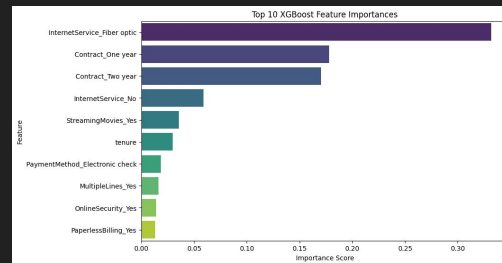
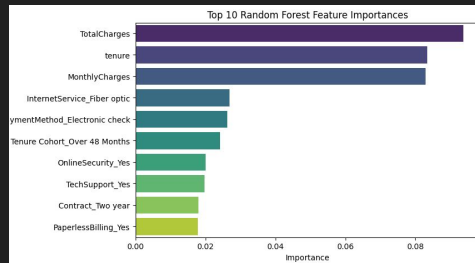
Model	Accuracy	ROC AUC	Precision (Churn)	Recall (Churn)
Logistic regression	78.2%	0.71	0.61	0.51
Random Forest	80.5%	0.83	0.64	0.52
XGBoost	80.0%	0.84	0.65	0.53
AdaBoost	80.0%	0.80	0.66	0.50

- XGBoost & AdaBoost performed the best
- AdaBoost chosen for its balance of performance & efficiency

# Feature Importance

## Key Drivers of Churn:

- Contract Type (Short-term contracts → higher churn)
- Tenure (New customers churn more)
- Internet & Streaming Services (Certain plans show higher churn rates)
- Payment Method (Electronic check users more likely to churn)



# Cost-Benefit Analysis of Retention Strategy

## Retention Incentive (StreamFlix Voucher)

- Cost: \$30 per voucher
- Avg Monthly Revenue per Customer: \$65
- Avg Retained Months: 6

## Threshold-Based Savings Analysis

Threshold	True Positives (Saved Customers)	False Positives (Unnecessary Vouchers)	Net Savings (\$)
0.10	350	497	111,090
0.50	199	109	68,370
0.90	13	1	4,650

Lowering the threshold captures more potential churners but increases false positives

A balance between recall & cost-effectiveness is needed

# Final Recommendations

## **Implement a Proactive Retention Strategy:**

- Use AdaBoost model to predict churners in advance
- Target high-risk customers before they call to cancel

## **Optimize Retention Offer Allocation:**

- StreamFlix vouchers should be strategically distributed, not blindly offered
- Focus on high-revenue & long-term potential customers
- Alternative: Consider discount plans for select groups

## **Continuous Model Refinement:**

- Deploy model & retrain monthly with updated data
- A/B Test retention strategies
- Explore additional features (e.g., customer complaints, engagement history)

# Conclusion & Next Steps

## Key Findings:

- Churn is driven by tenure, contract type, and service selection
- AdaBoost provides an effective, computationally efficient solution
- Cost-benefit analysis suggests optimizing incentive allocation

## Next Steps:

- Deploy AdaBoost model for pilot testing
- Develop targeted retention messaging
- Monitor performance & refine approach

**Thank you!**