Customer Churn Prediction: Final Report

1. Executive Summary

This report details the findings of a predictive modeling project aimed at identifying telecom customers at risk of churning. By analyzing historical customer data, we have developed a machine learning model that predicts churn with a high degree of accuracy (AUC: 0.83).

The primary drivers of churn were identified as short customer tenure, month-to-month contracts, and the type of internet service. Based on these findings, we recommend targeted retention campaigns focusing on new customers and those on flexible contracts to improve long-term customer loyalty and reduce revenue loss.

2. Key Drivers of Customer Churn

The following chart displays the top features that most strongly influence a customer's decision to churn. Contract type and tenure are the most significant factors.

[Image not found at 'reports/feature_importance.png']

3. Predictive Model Performance

We evaluated three models, with XGBoost selected for deployment due to its robust performance.

Key Metrics (XGBoost Model):
- Accuracy: 79.1%
- Precision: 63.4% (Of all customers we predict will churn, 63.4% actually do).
- Recall: 49.5% (We successfully identify 49.5% of all customers who are about to churn).
- ROC AUC Score: 0.826 (Excellent ability to distinguish between churners and non-churners).

4. Actionable Recommendations

1. **Target Month-to-Month Customers:** Launch a campaign offering a small discount for switching to a 1-year contract.

2. **Enhance New Customer Onboarding:** Implement a 'First 90 Days' program with proactive check-ins to address issues early.

3. **Investigate Fiber Optic Churn:** Survey former fiber optic customers to identify and fix service or pricing pain points.

4. **Bundle 'Sticky' Services:** Promote bundles that include high-retention services like Online Security and Tech Support.