TELCO CHURN CLASSIFICATION

By

Rony Muriithi

OVERVIEW

Introduction

Telco industry serves as a global connectivity hub, offering a range of services from traditional voice communication to advanced data transmission.

Relies on robust network infrastructures to connect individuals, businesses, and devices globally.

Adapts to technological advancements, intense competition, and regulatory shifts to maintain industry relevance.

Focuses on delivering reliable and innovative communication services, responding to evolving consumer demands.

Plays a pivotal role in shaping modern connectivity, influencing how people and organizations connect and access information.

Challenges

I.   Customer Satisfaction: Factors like pricing, quality of customer service, and network performance directly impact customer satisfaction and, consequently, churn rates.

II.   Intense Competition: Telco companies face fierce competition, pushing them to constantly innovate and stand out to retain customers.

III.   Technological Advancements: Rapid changes in technology and evolving consumer preferences add complexity, requiring quick adaptations to stay relevant.

IV.   Regulatory Challenges: Adhering to regulatory changes and compliance requirements demands agile responses to maintain service excellence.

Solutions

Implement customer-centric pricing.

Enhance customer service quality.

Develop a robust regulatory compliance framework.

Utilize machine learning for churn analysis.

Aim to improve overall operational efficiency and customer satisfaction.

Problem Statement

Telecommunication companies are grappling with the challenge of customer churn, where subscribers are discontinuing services. This results in revenue loss and a negative impact on business sustainability.

To address this issue, there is a need for an effective solution. Implementing a classification model to predict customer churn can be a proactive approach, allowing companies to identify potential churners early and implement targeted retention strategies.

 This model will contribute to reducing churn rates, enhancing customer satisfaction, and ultimately, ensuring the long-term success of Telco businesses.

Objectives

 i. Develop a model to predict customer churn, allowing proactive retention measures and overall reduction in churn rate.

ii. Analyze churn rates across various demographic and service segments to identify groups more prone to churning.

iii. Investigate the impact of different services on churn to discern correlations with higher or lower churn rates.

iv. Explore the connection between customer loyalty (tenure) and churn to inform strategies for enhancing loyalty programs and retaining long-term customers.

Business Understanding

Telco sector grapples with a significant challenge: customer churn, posing revenue loss and business sustainability risks.

Implementation of a predictive classification model is crucial to address this issue.

Proactive identification of potential churners enables early intervention and targeted retention strategies.

The overarching goal is to minimize churn rates, elevate customer satisfaction, and ensure long-term success amid a competitive market.

Data Understanding

The Telco Customer Churn Dataset comprises 7,043 entries with 21 columns.

Key features include customer demographics, services subscribed, contract details, and billing information.

| Column	Description
customerID	Unique identifier for each customer.
gender	Gender of the customer (e.g., Male or Female).
SeniorCitizen	Binary indicator for senior citizen status (1 or 0).
Partner	Whether the customer has a partner (Yes or No).
Dependents	Whether the customer has dependents (Yes or No).
tenure	Number of months the customer has been with the company.
PhoneService	Whether the customer has phone service (Yes or No).
MultipleLines	Whether the customer has multiple lines (Yes, No, or No phone service).
InternetService	Type of internet service (DSL, Fiber optic, or No).
OnlineSecurity	Availability of online security (Yes, No, or No internet service).
OnlineBackup	Availability of online backup (Yes, No, or No internet service).
DeviceProtection	Availability of device protection (Yes, No, or No internet service).
TechSupport	Availability of tech support (Yes, No, or No internet service).
StreamingTV	Availability of streaming TV (Yes, No, or No internet service).
StreamingMovies	Availability of streaming movies (Yes, No, or No internet service).
Contract	Type of customer contract (Month-to-month, One year, Two years).
PaperlessBilling	Whether the customer uses paperless billing (Yes or No).
PaymentMethod	The customer's payment method.
MonthlyCharges	Monthly amount charged to the customer (in dollars).
TotalCharges	Total amount charged to the customer.
Churn	Customer churn status (Yes or No).

Data Analysis

Distribution of Churn
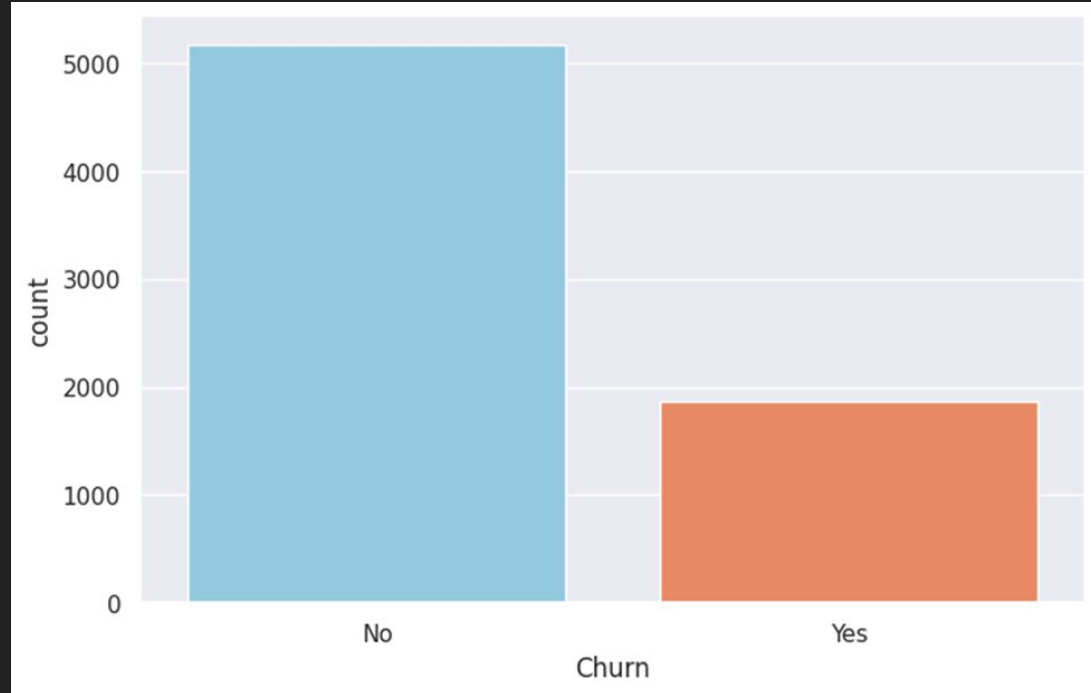
Exploring Different Demographic Segments

Churn rate by Gender

Churn Rate for Males: 26.9%
Churn Rate for Females: 26.2%

Observation: The churn rates for males and females are relatively close, suggesting that gender alone may not be a strong predictor of churn.

Churn Rates by gender
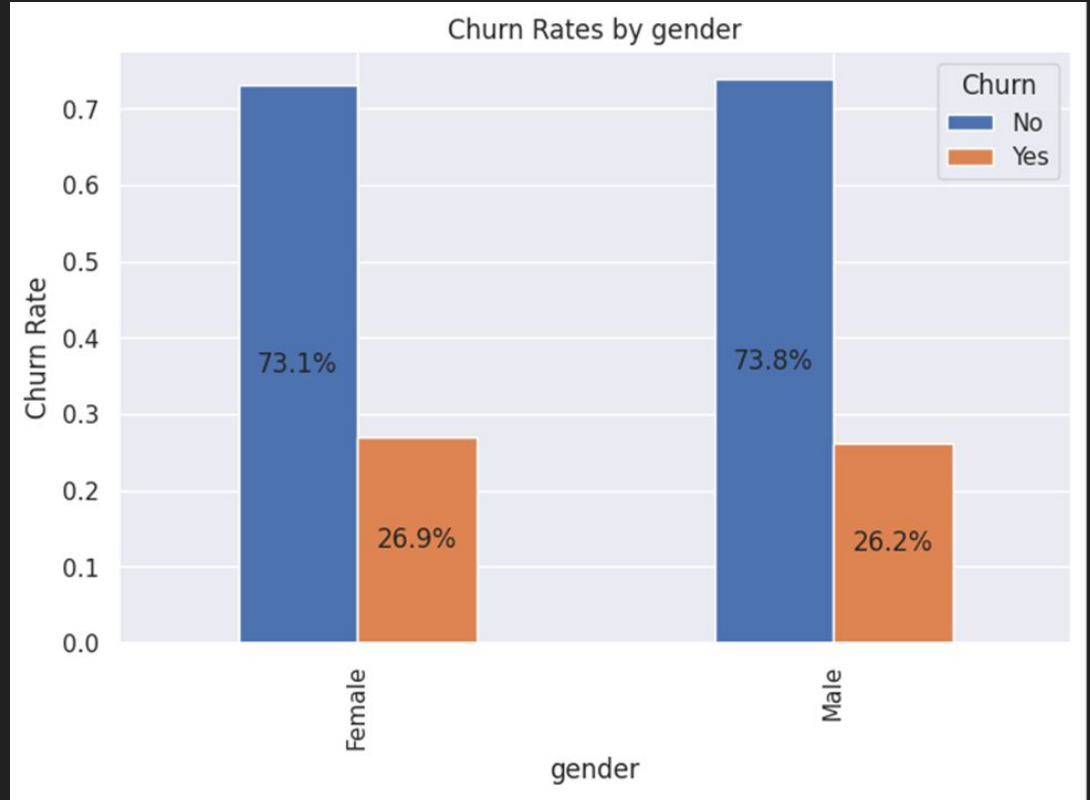
Churn rate by Senior Citizenship

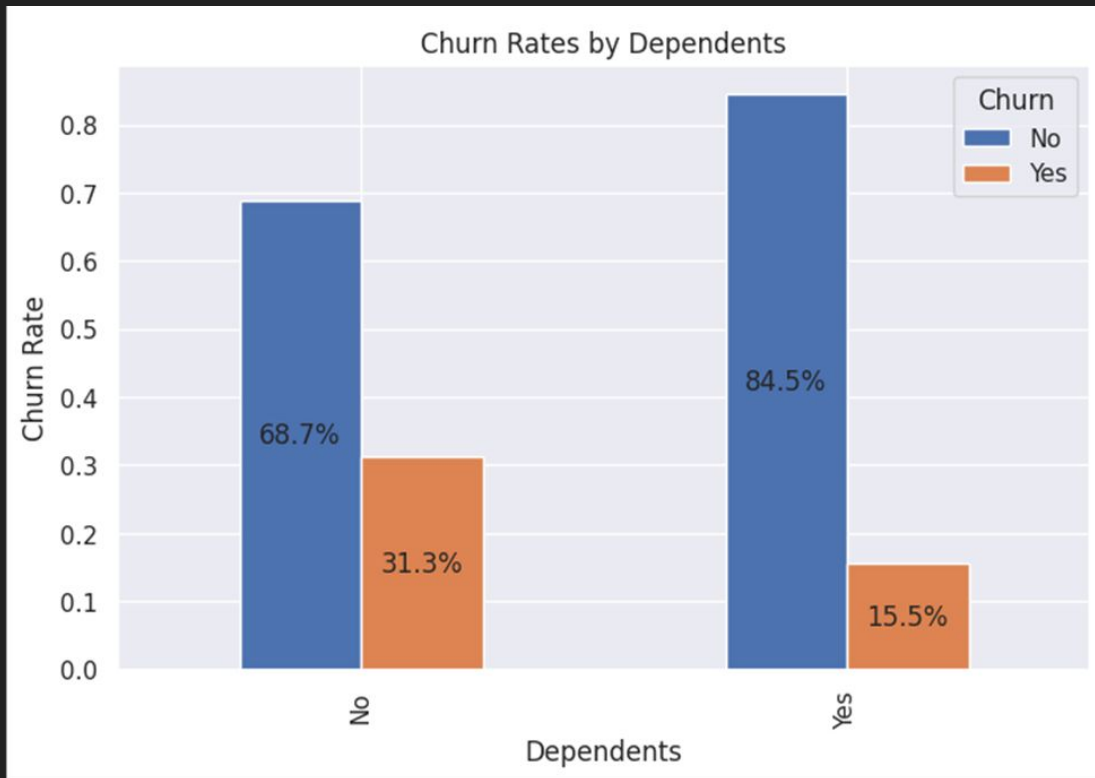Churn Rate for Non-Senior Citizens (0): 23.6% Churn Rate for Senior Citizens (1): 41.7%

Senior citizens have a higher churn rate.
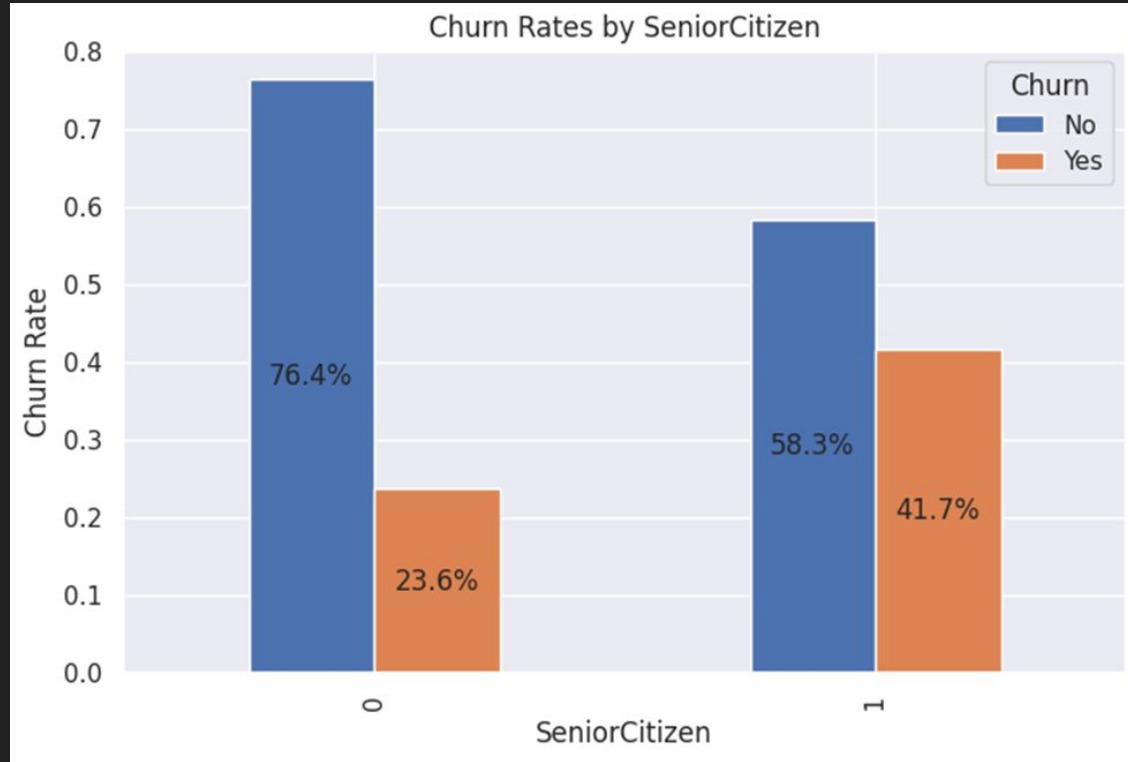
Churn rate by Dependents

Churn Rate for No Dependents (0): 31.3% Churn Rate for Dependents (1): 15.5%

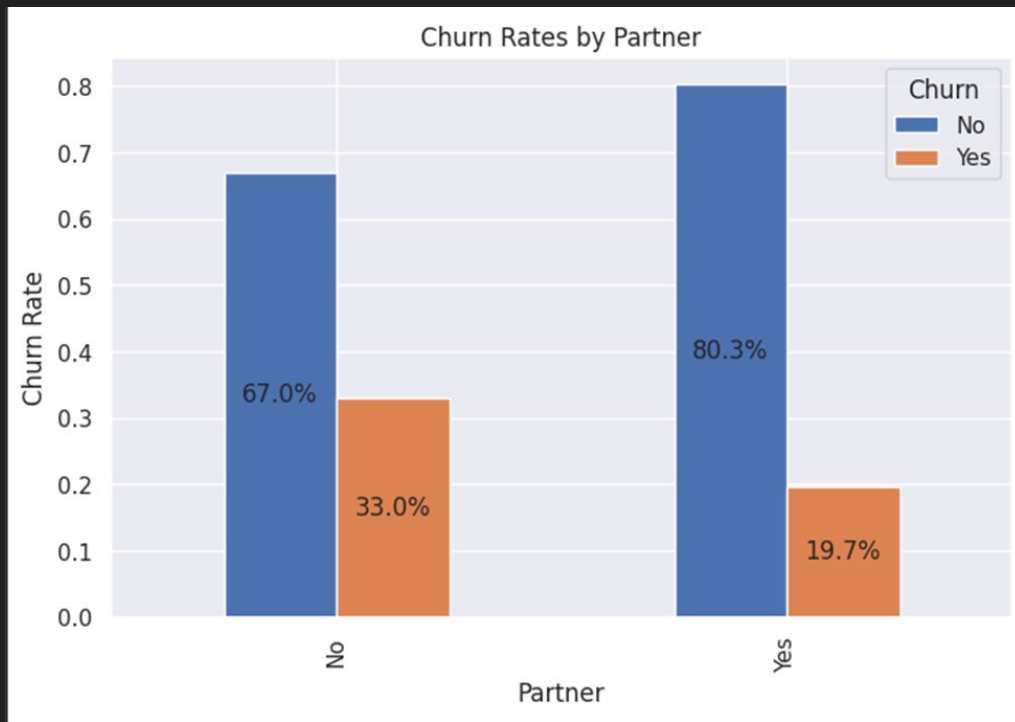Having dependents appears to be associated with lower churn.

Churn rate by Partner

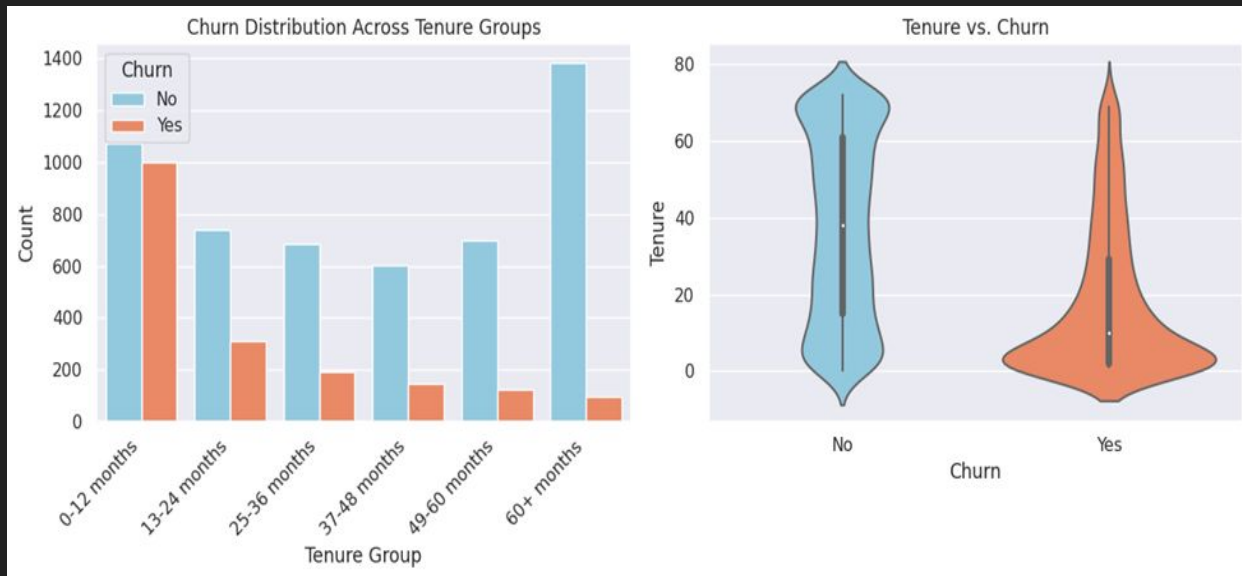Churn Rate for No Partner (0): 33%
Churn Rate for Partner (1): 19.7%

Having a partner appears to be
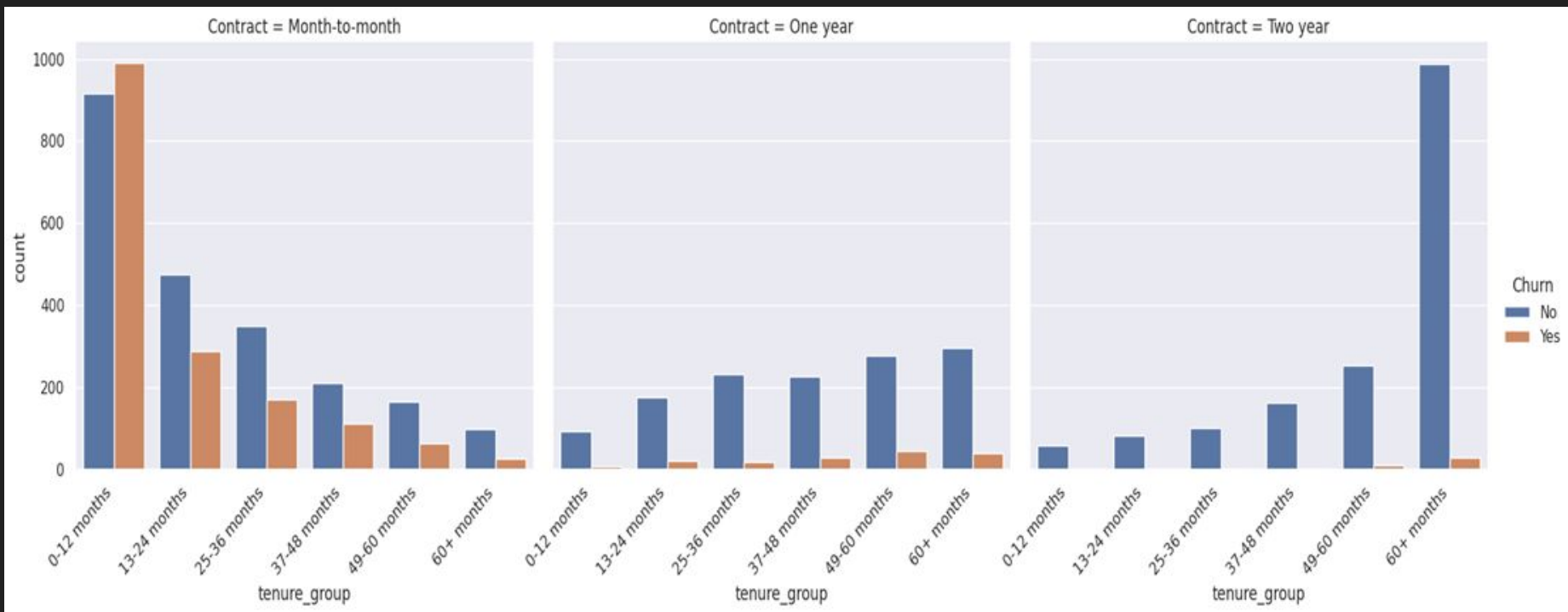associated with lower churn

Churn by tenure

"60+ months" tenure group has the highest retention; "0-12 months" has the highest churn.

Violin plot emphasizes churned customers having lower tenure.
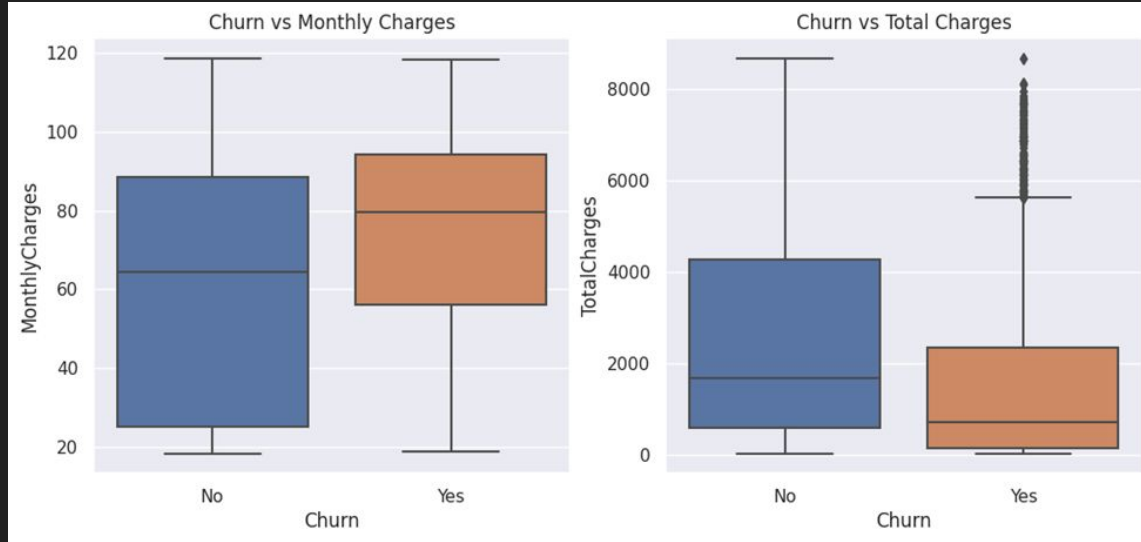
Churn vs Contract

Churn vs (Total Charges and Monthly Charges)

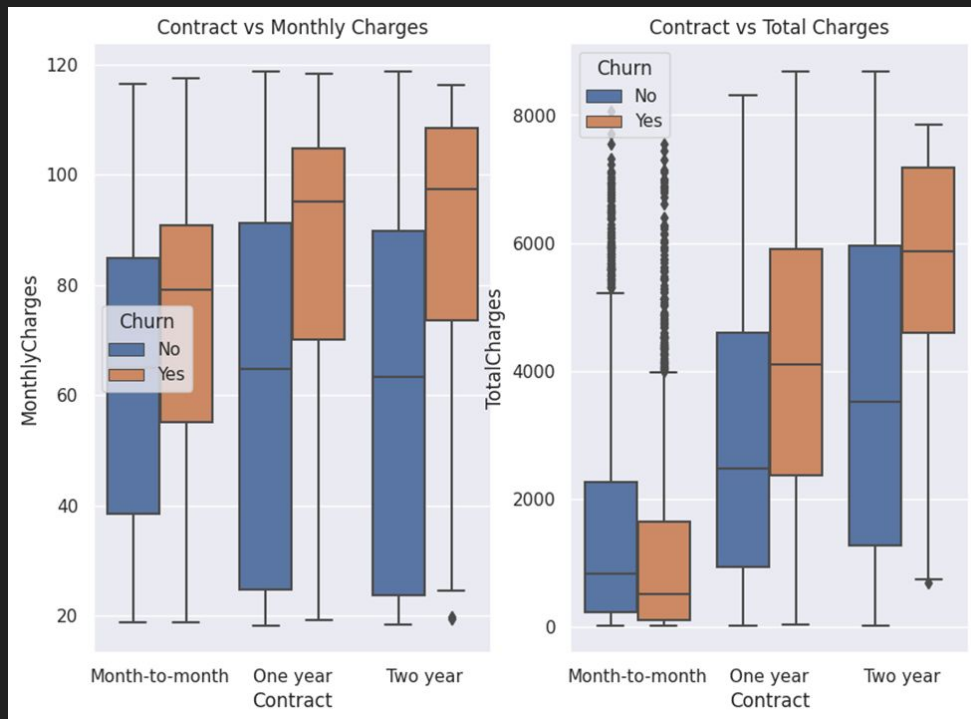Customers with elevated monthly charges are associated with higher churn rates.

Customers with lower total charges tend to experience a higher churn rate.

Contract vs (Total Charges and Monthly Charges)

Individuals with higher monthly charges appear to favor longer-term contracts.

Modeling

Recall measures the ability of the model to capture all instances of a positive class (churn) among the actual positive cases.

High recall minimizes the chances of overlooking potential churners, aiding in proactive retention strategies.

The Bagged Classifier showed the best performance, achieving a recall of 0.807.

	Model	Recall Score
0	Bagging Classifier(Logistic Regression)	0.807487
1	Logistic Regression	0.802139
2	Logistic Regression (Tuned)	0.802139
3	Random Forest (Tuned)	0.692513
4	GradientBoost	0.673797
5	XGBoost	0.553476
6	Decision Tree	0.540107
7	Random Forest	0.529412

Recommendations

1. Continuous Model Refinement: Regularly update and refine the model.

2. Data Enrichment: Augment dataset for deeper insights.

3. Collaboration with Customer Service: Partner with customer service for qualitative insights.

4. Personalized Incentives: Tailor incentives based on model insights.

5. A/B Testing: Experiment with varied retention strategies.

THANK YOU