



CUSTOMER CHURN PREDICTION

DSF 30 – Data Science



What is Customer Churn?



Customer churn refers to the rate at which customers stop doing business with a company. It is a critical metric as it directly impacts a company's revenue, growth, and customer retention. Understanding churn allows businesses to take proactive measures to retain customers and reduce turnover.



Why Analyze Customer Churn?



Identify the key factors that drive customer churn.



Develop predictive models to forecast churn.



Provide actionable insights to improve customer retention strategies.

Business Questions

- 1.What are the primary factors driving customer churn?
- 2.How accurately can we predict customer churn?
- 3.Are there specific behavioral patterns that indicate a higher likelihood of churn?
- 4.What is the impact of payment delays on the likelihood of churn?
- 5.Which customer segments are most vulnerable to churn?



Understanding the Dataset



The dataset provides a comprehensive view of various customer-related features.



Data Preprocessing



**Handling missing
values**



**Encoding
categorical
variables**



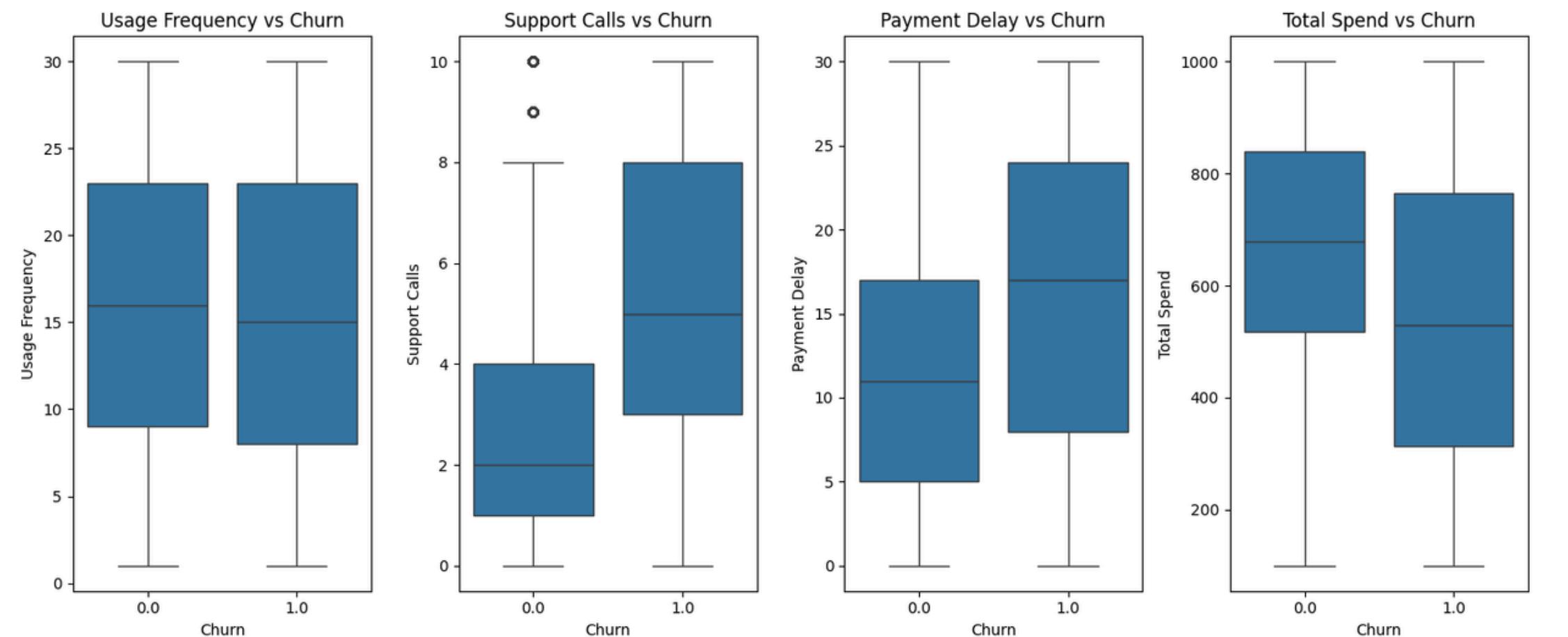
**Normalizing
numerical
features**



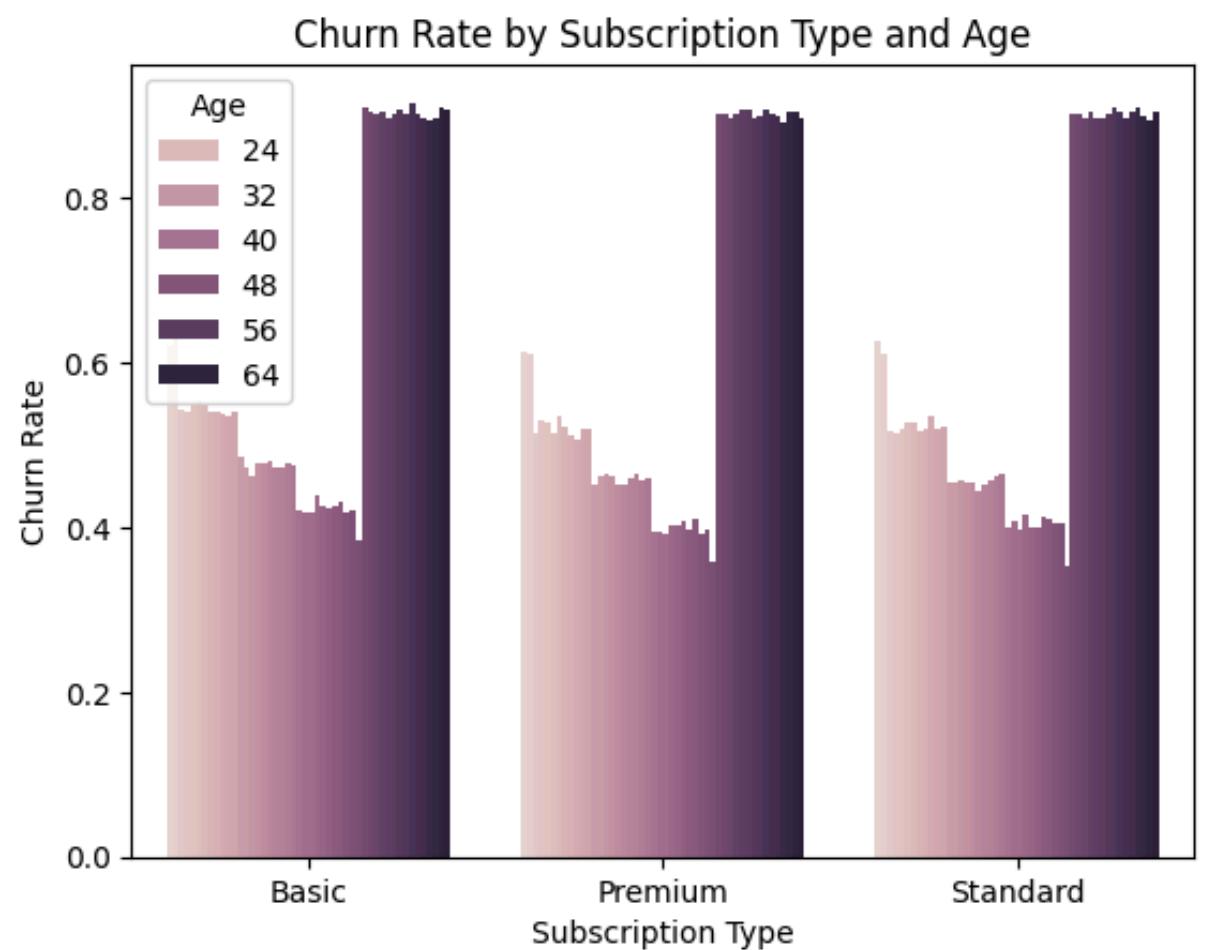
**Splitting the dataset
into training and
testing sets**

Exploratory Data Analysis (EDA)

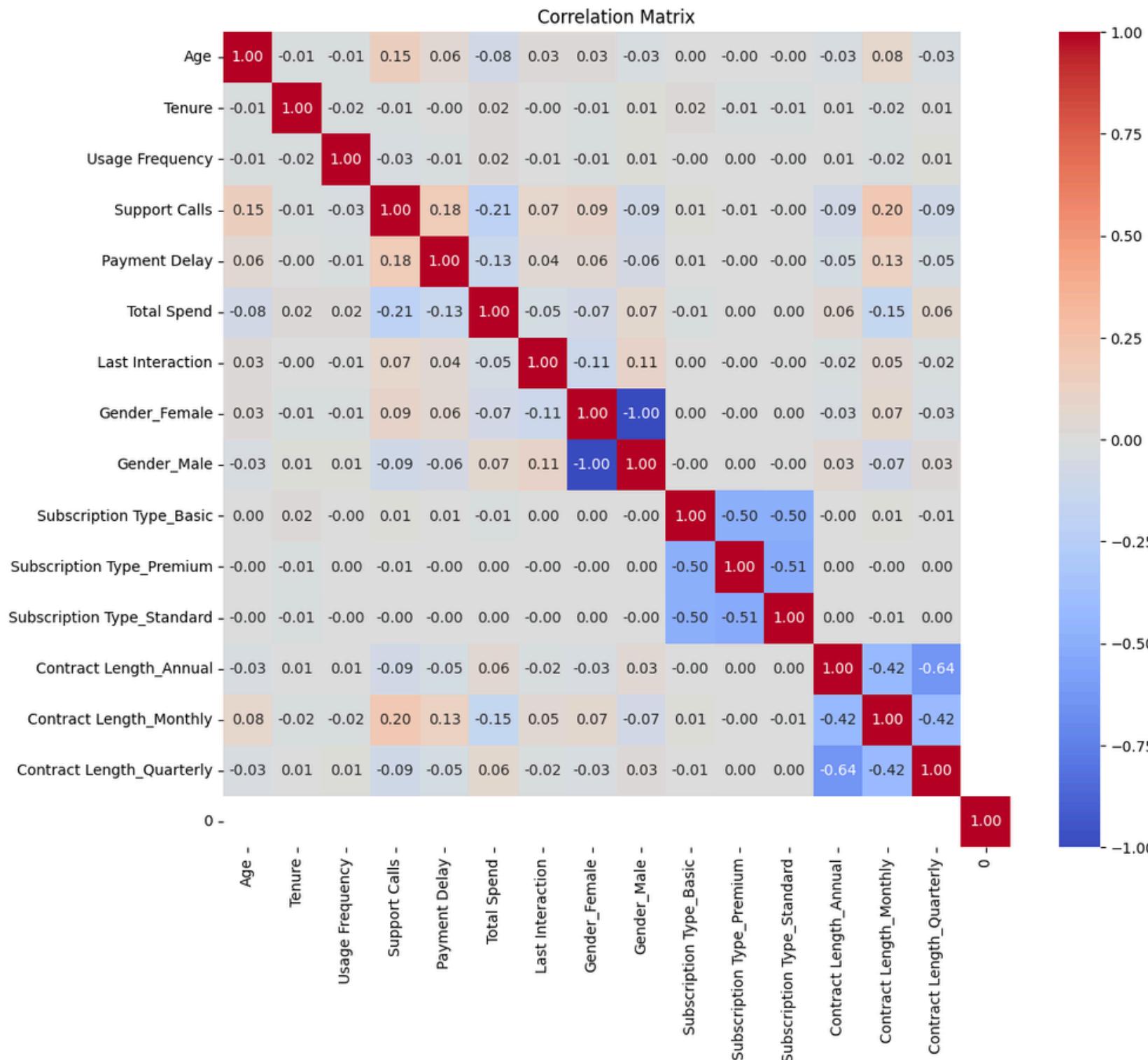
Customer Behavior



Customer Segmentations



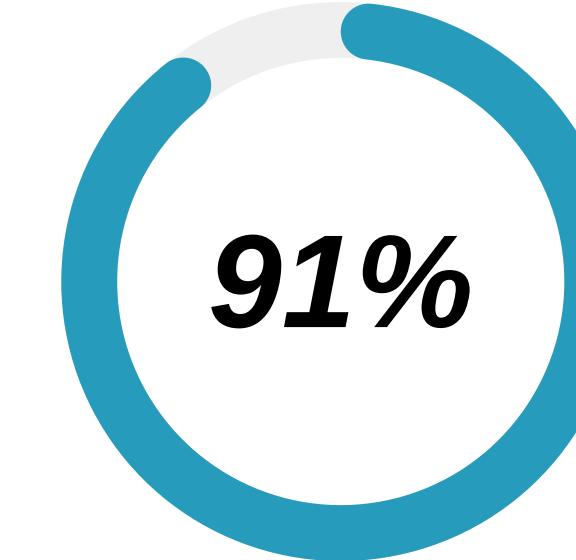
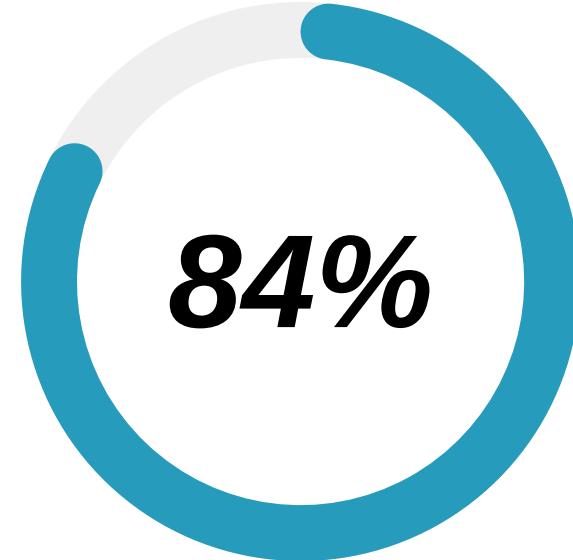
Feature Engineering



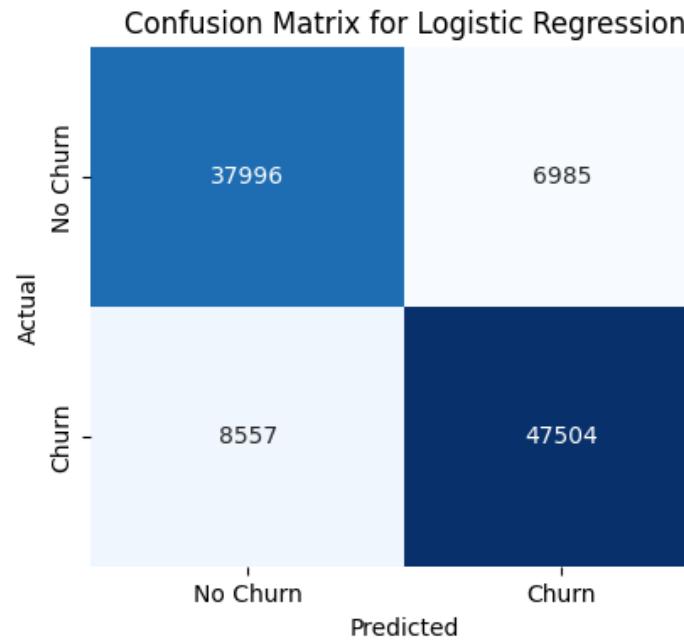
Key Factors Affecting Churn:		
Feature	Importance	
Support Calls	0.250246	
Total Spend	0.187302	
Payment Delay	0.141135	
Age	0.131512	
Contract Length_Monthly	0.077133	
Last Interaction	0.068746	
Tenure	0.042409	
Usage Frequency	0.032925	
Contract Length_Quarterly	0.015780	
Gender_Female	0.015203	
Contract Length_Annual	0.014904	
Gender_Male	0.013193	
Subscription Type_Basic	0.003589	
Subscription Type_Standard	0.002990	
Subscription Type_Premium	0.002931	

Machine Learning Model

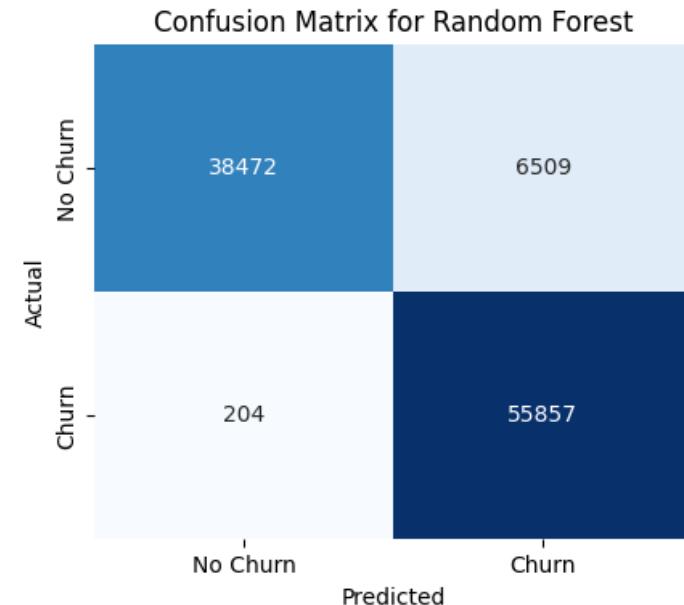
Accuracy



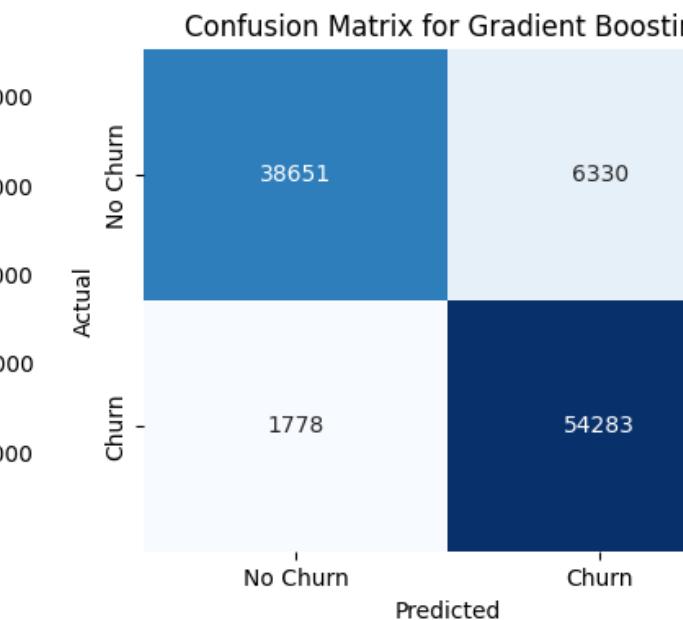
*Logistic
Regression*



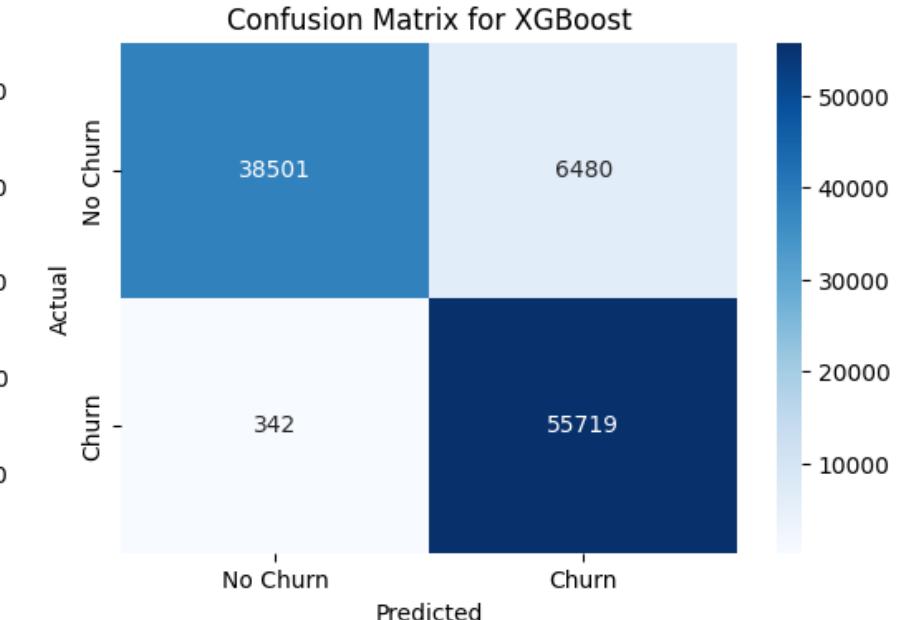
Random Forest



Gradient Boosting



XGBoost





Conclusion

1. What are the primary factors driving customer churn?

The analysis shows that payment delays, usage frequency, and the number of support calls are significant factors contributing to customer churn. Customers who frequently delay payments, use the service less often, or contact support more frequently are at a higher risk of leaving.

2. How accurately can we predict customer churn?

We evaluated several machine learning models to predict customer churn, including Logistic Regression, Random Forest, Gradient Boosting, and XGBoost. The accuracy of these models varied, with Logistic Regression achieving an accuracy of 84%, Random Forest at 93%, Gradient Boosting at 91%, and XGBoost also at 93%. These metrics suggest that both Random Forest and XGBoost are highly effective in predicting customer churn, offering a reliable way to identify customers at risk.

Conclusion

3. Are there specific behavioral patterns that indicate a higher likelihood of churn?

Yes, the analysis uncovered specific behavioral patterns linked to a higher likelihood of churn. These include low service usage, frequent payment delays, and increased contact with customer support. Customers exhibiting these behaviors are more likely to churn, indicating a need for focused retention efforts on these individuals.

4. What is the impact of payment delays on the likelihood of churn?

The study found a significant positive correlation between payment delays and customer churn. Customers with more frequent payment delays have a higher probability of churning. Addressing payment processes and offering incentives for timely payments could thus play a key role in reducing churn rates.

5. Which customer segments are most vulnerable to churn?

The segmentation analysis identified that customers with basic or lower-tier subscription plans and those in younger age demographics are particularly vulnerable to churn. Higher churn rates in these segments suggest the necessity of targeted retention strategies, such as personalized communication, special offers, and enhanced customer support to retain these customers.



**THANK YOU
FOR YOUR ATTENTION**

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