CONNECTTEL

Case Study

Customer Churn Prediction

ABOUT US

ConnectTel is a leading telecommunications company at the forefront of innovation and connectivity solutions. ConnectTel has established itself as a trusted provider of reliable voice, data, and Internet services.

Aim of the Project

- ConnectTel Telecom Company faces the pressing need to address customer churn, which poses a significant threat to its business sustainability and growth.

- The goal is to develop a machine learning model that can predict and accurately identify customers that are at risk of churning.

Benefits of the Prediction

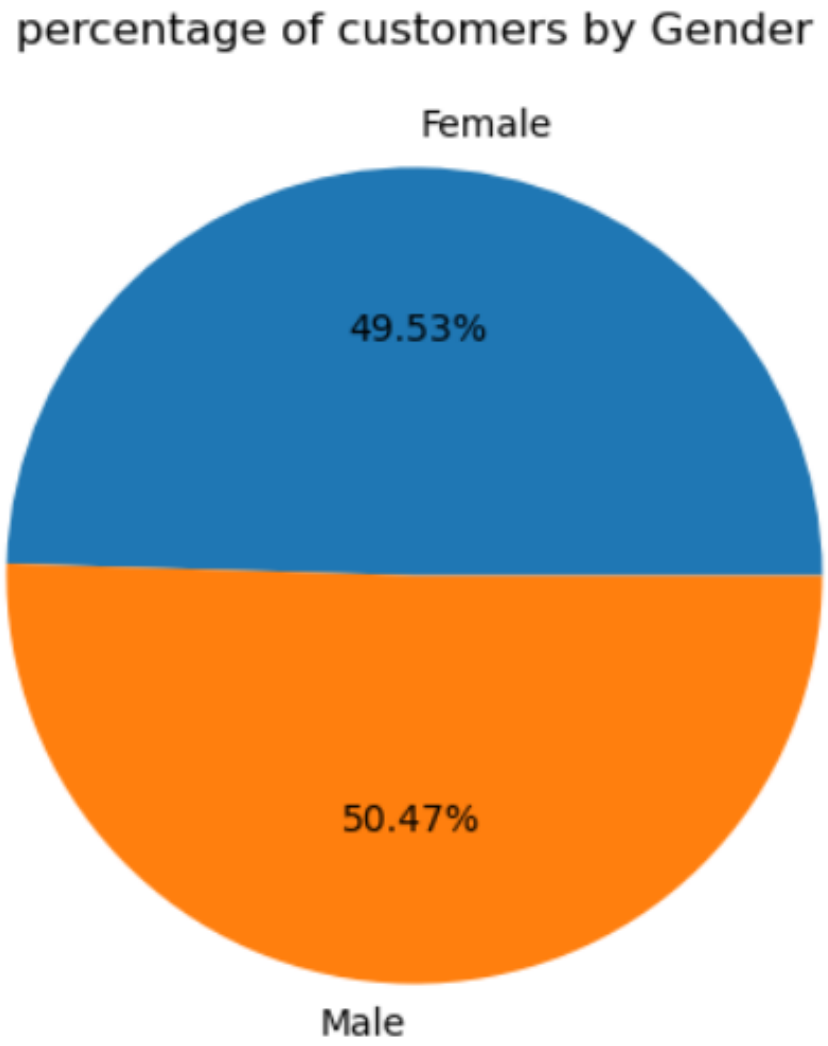
The project's successful implementation will benefit ConnectTel Telecom Company in several ways:

- Reduce customer churn
- Enhance customer loyalty
- Competitive advantage
- Optimize resources
- Data driven decision making

Exploratory Data Analysis

Univariate Analysis

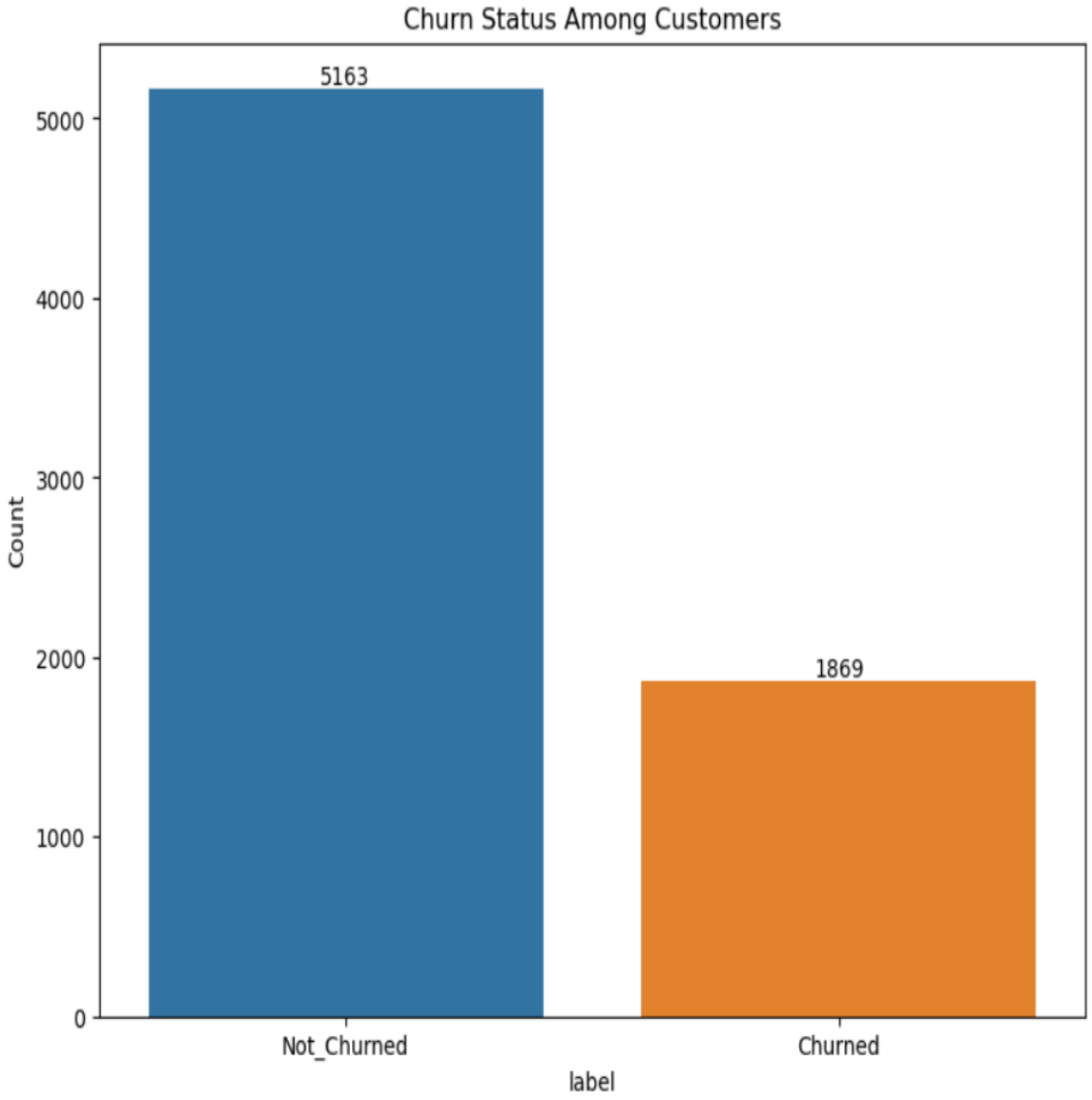
The customer base is nearly evenly split between male and female customers, with a slightly higher percentage being male.



Exploratory Data Analysis

Univariate Analysis

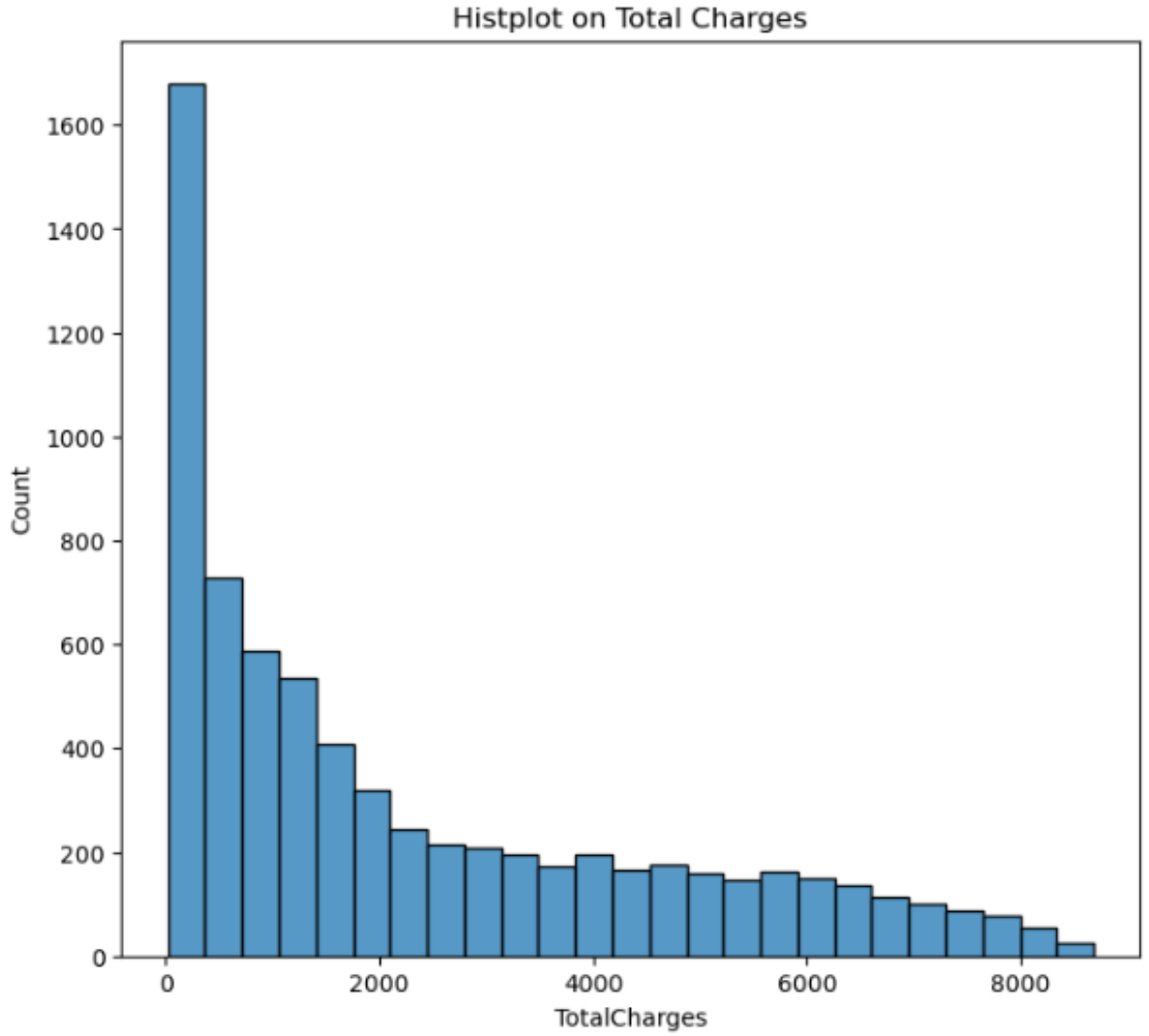
This analysis shows that the majority of the customer base has shown loyalty by not churning, with a smaller subset choosing to churn.



Exploratory Data Analysis

Univariate Analysis

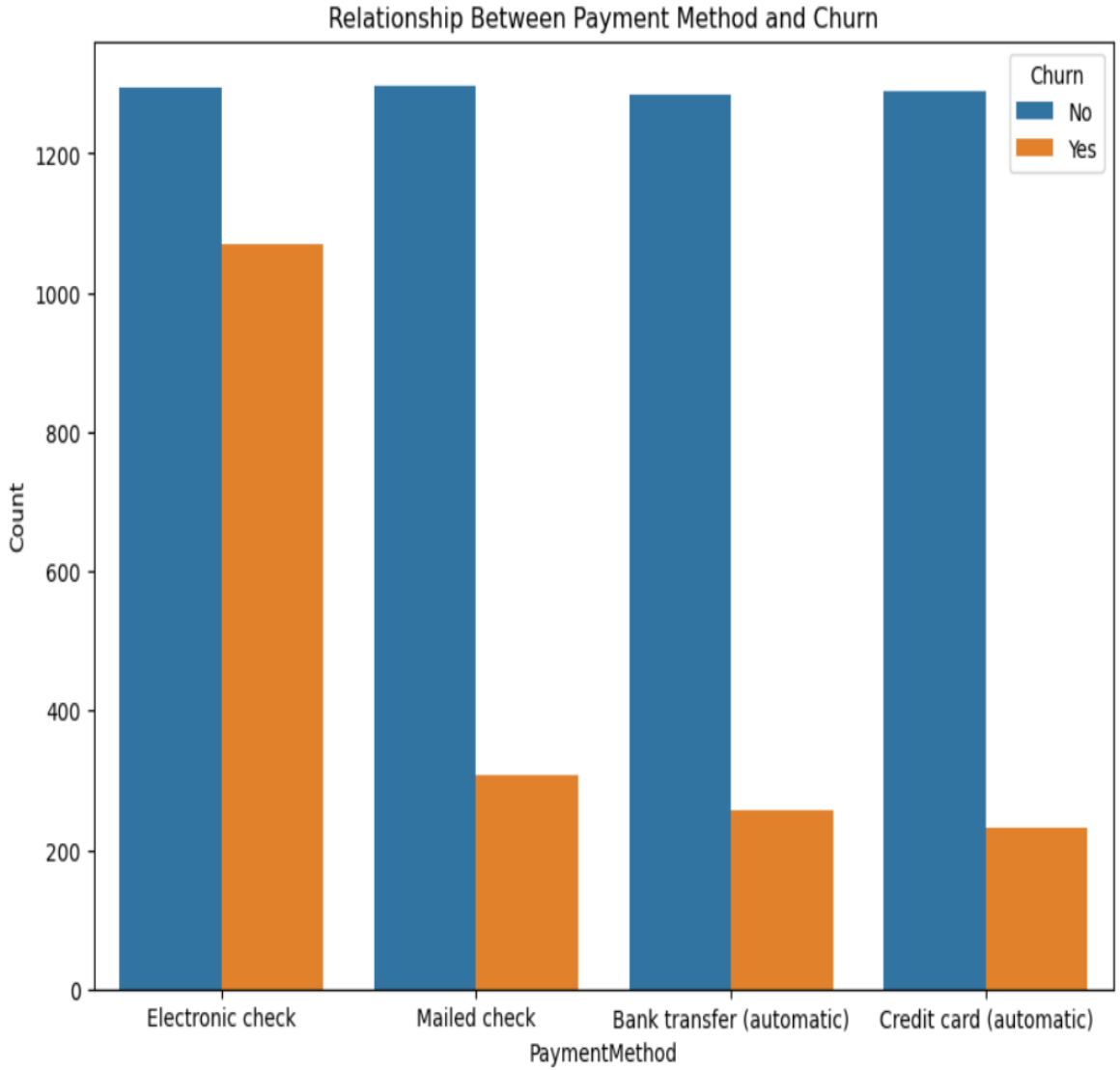
This distribution plot of total charges reveal a right-skewed pattern, with most customers accumulating lower cumulative expenses over their tenure with the company.



Exploratory Data Analysis

Bivariate Analysis

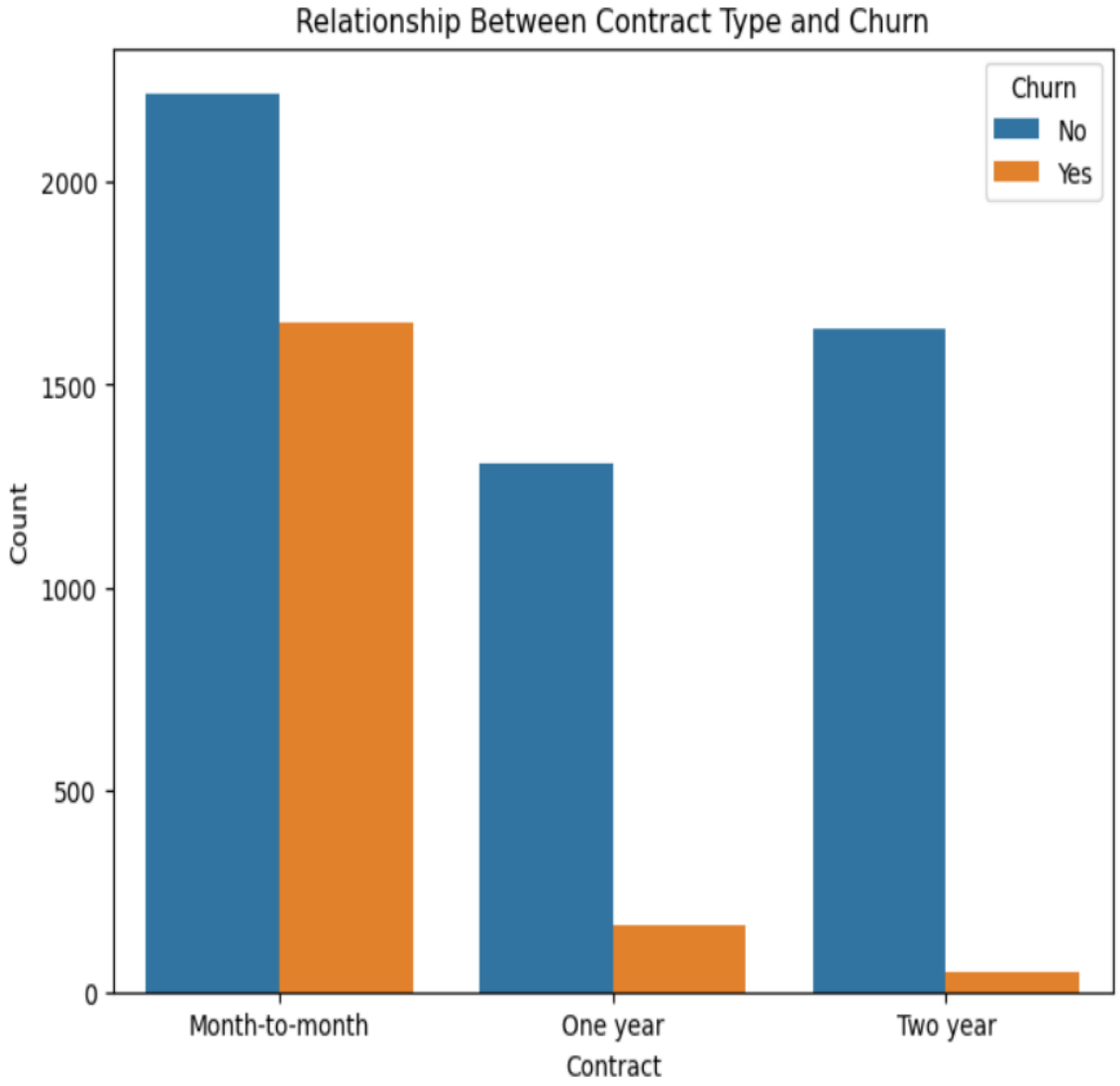
A notable observation is that the majority of customers using the "Electronic Check" payment method exhibit a higher churn rate. This suggests that there might be specific issues or concerns associated with this payment method that could be contributing to higher customer attrition.



Exploratory Data Analysis

Bivariate Analysis

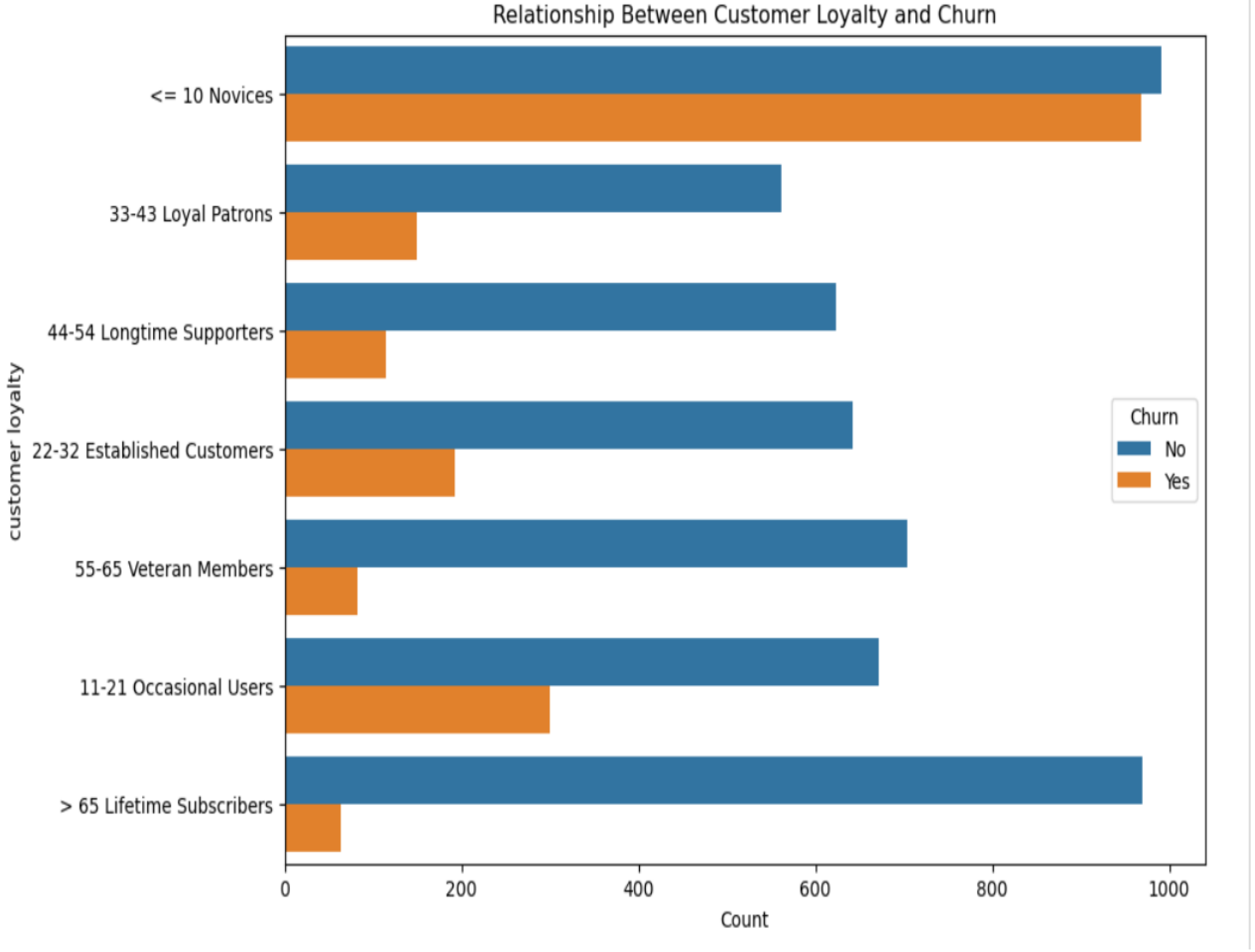
This analysis shows that majority of customers on a "Monthly" subscription exhibit a higher churn rate. In contrast, customers on longer term contracts (i.e, yearly) display relatively lower churn rates.



Exploratory Data Analysis

Bivariate Analysis

The plot explores the association between customer loyalty, categorized into different groups, and customer churn. Notably, customers classified as "Novice," who have been with the company for less than 11 months, exhibit a higher churn rate compared to other customer loyalty groups, and also a significant number of “Occasional User”.

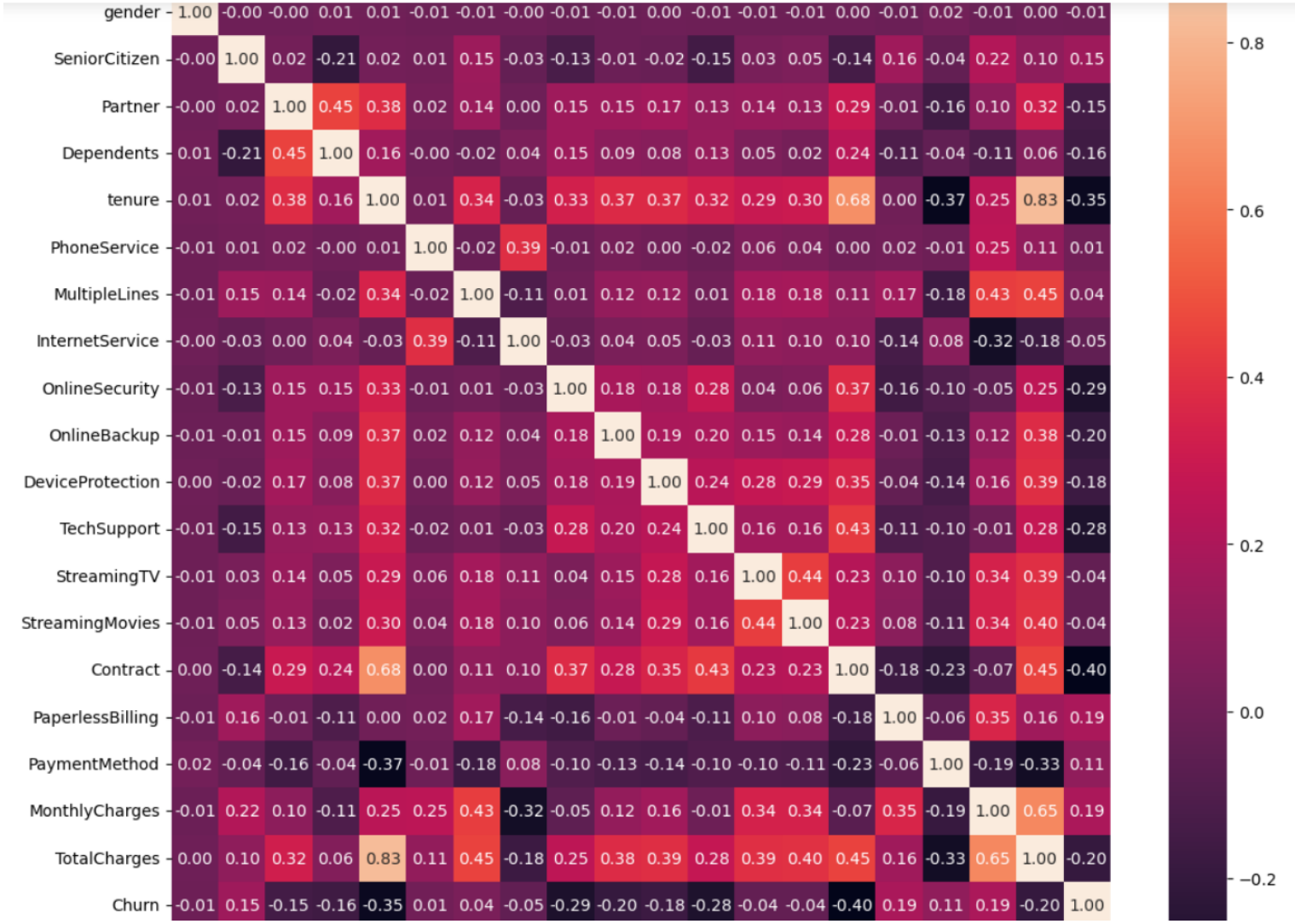


Exploratory Data Analysis

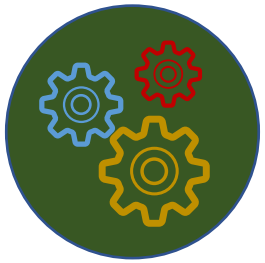
Multivariate Analysis

Referencing the correlation heatmap, longer-term customers are less likely to cancel services.

Online security services lower churn rates, implying higher customer retention.

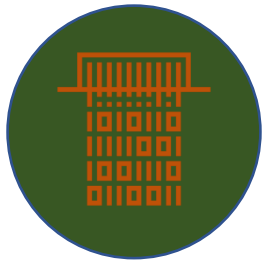


Data Pre-processing Steps



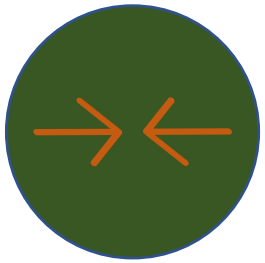
Feature Engineering

Some of the independent features were dropped and the target variable was separated from the other features.



Encoding

One-hot encoding was used to encode the independent features while label encoder was used to encode the target variable.



Scaling

The MinMaxScaler was used to scale three of the independent features.

Model Building

- The dataset was split into:
  80% Train </> 20 Test
- Eight models were implemented
- The key evaluation Metrics:
  Precision and Recall

Accuracy score

	XGB Classfier	Random Forest	K-Nearest Neighbors	SGD Classfier	SVC	Naive Bayes	Decision Tree	Logistic Regression
0	76.55%	78.11%	74.27%	77.19%	78.54%	68.37%	72.0%	78.75%

Recall score

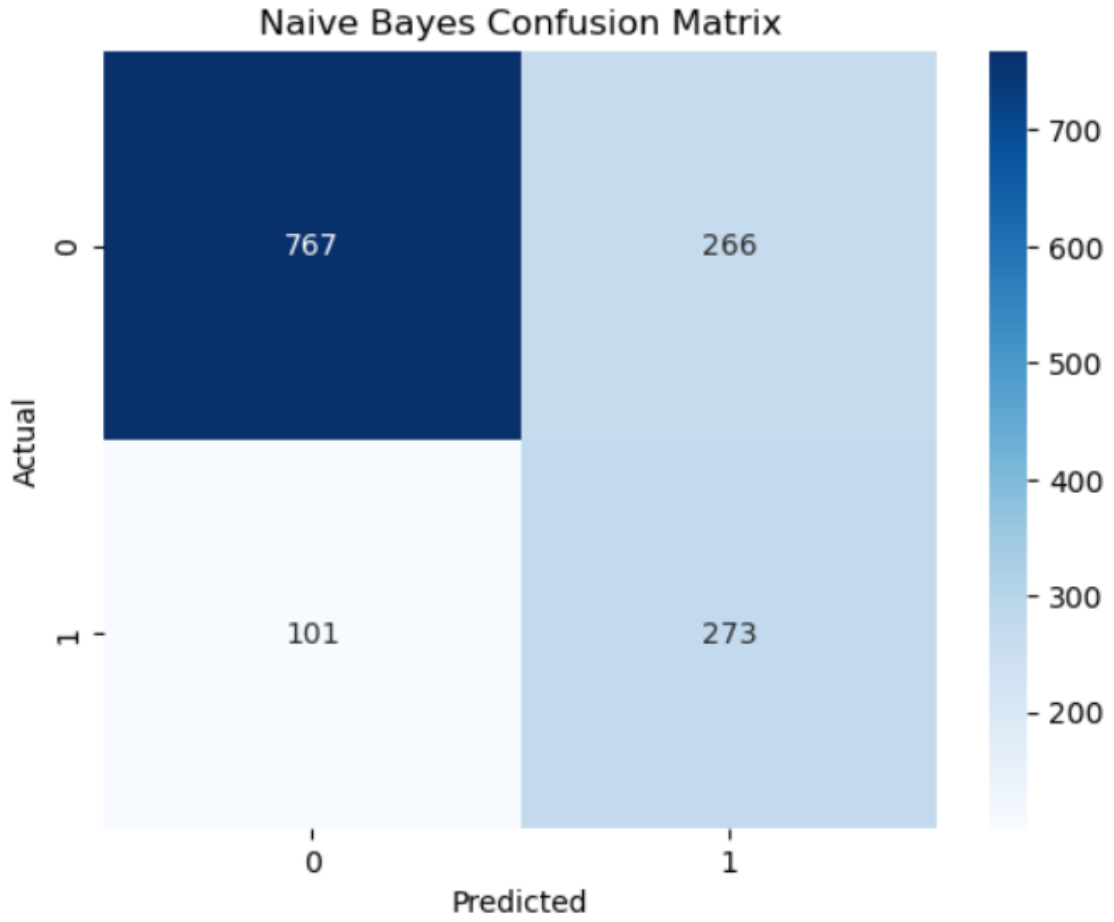
	XGB Classfier	Random Forest	K-Nearest Neighbors	SGD Classfier	SVC	Naive Bayes	Decision Tree	Logistic Regression
0	48.66%	46.26%	51.07%	27.01%	48.13%	84.22%	50.53%	51.34%

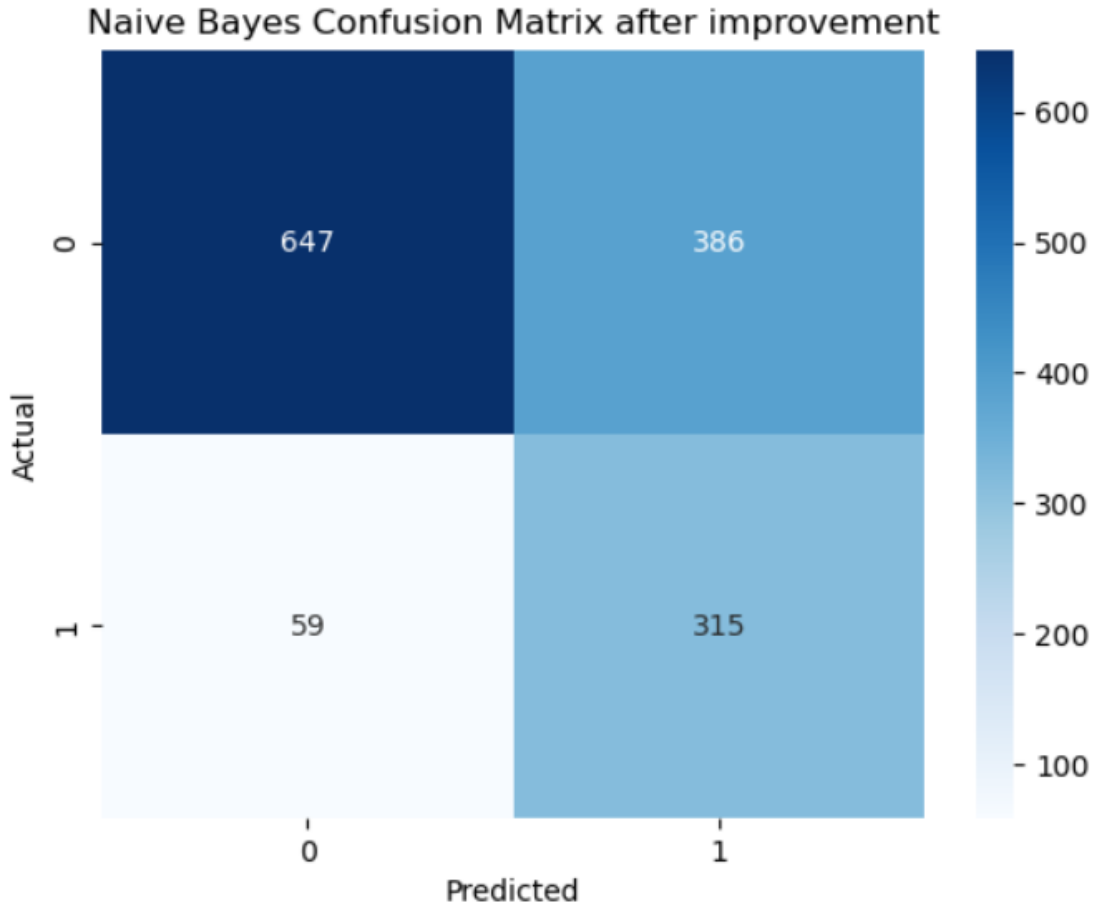
Precision score

	XGB Classfier	Random Forest	K-Nearest Neighbors	SGD Classfier	SVC	Naive Bayes	Decision Tree	Logistic Regression
0	56.88%	61.79%	51.62%	67.79%	62.5%	44.94%	47.49%	62.14%

Model Selection

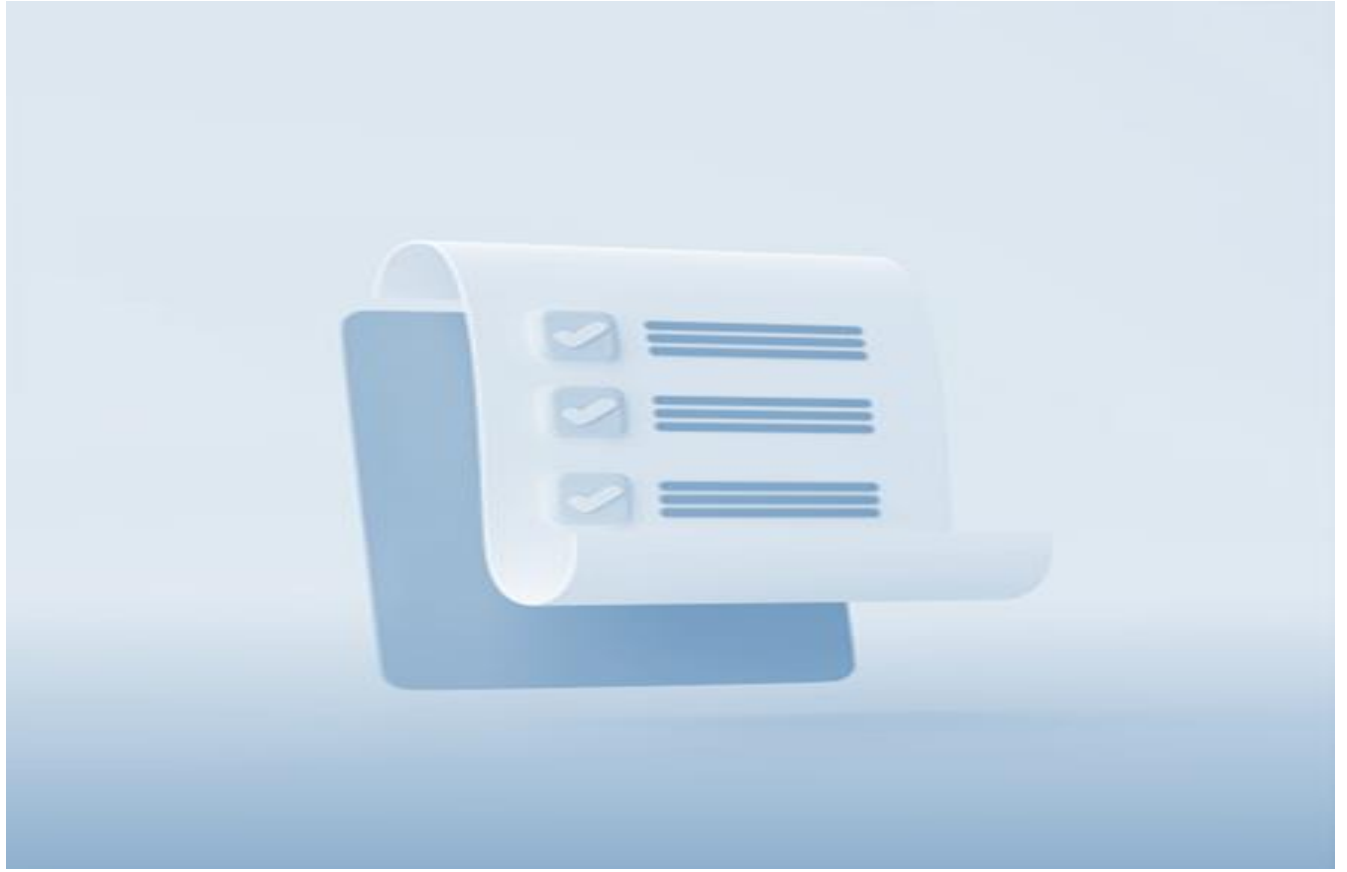
Naïve Bayes





Conclusion

Given the company's goal of accurately predicting customers who are going to **churn** (cancel the service), the most suitable model from the evaluation provided would be the **Naive Bayes** model after adjustments.



Recommendations

- Personalize Retention Strategies
- Proactive Customer Support
- Feedback Mechanism
- Competitive Pricing and Packages

THANK YOU

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