

Telecom Churn Analysis EDA Case Study

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Business Understanding & Overview

- In the telecom world, keeping customers happy and sticking around is crucial. But sometimes, customers leave, and that's called churn. Exploratory Data Analysis (EDA) is like digging into a data to find out why customers might be leaving.
- EDA helps telecom companies figure out what's going on with their customers. In this case, we're looking at customer data to spot patterns and clues about why they might leave.

Objectives of Telecom Churn Analysis EDA:

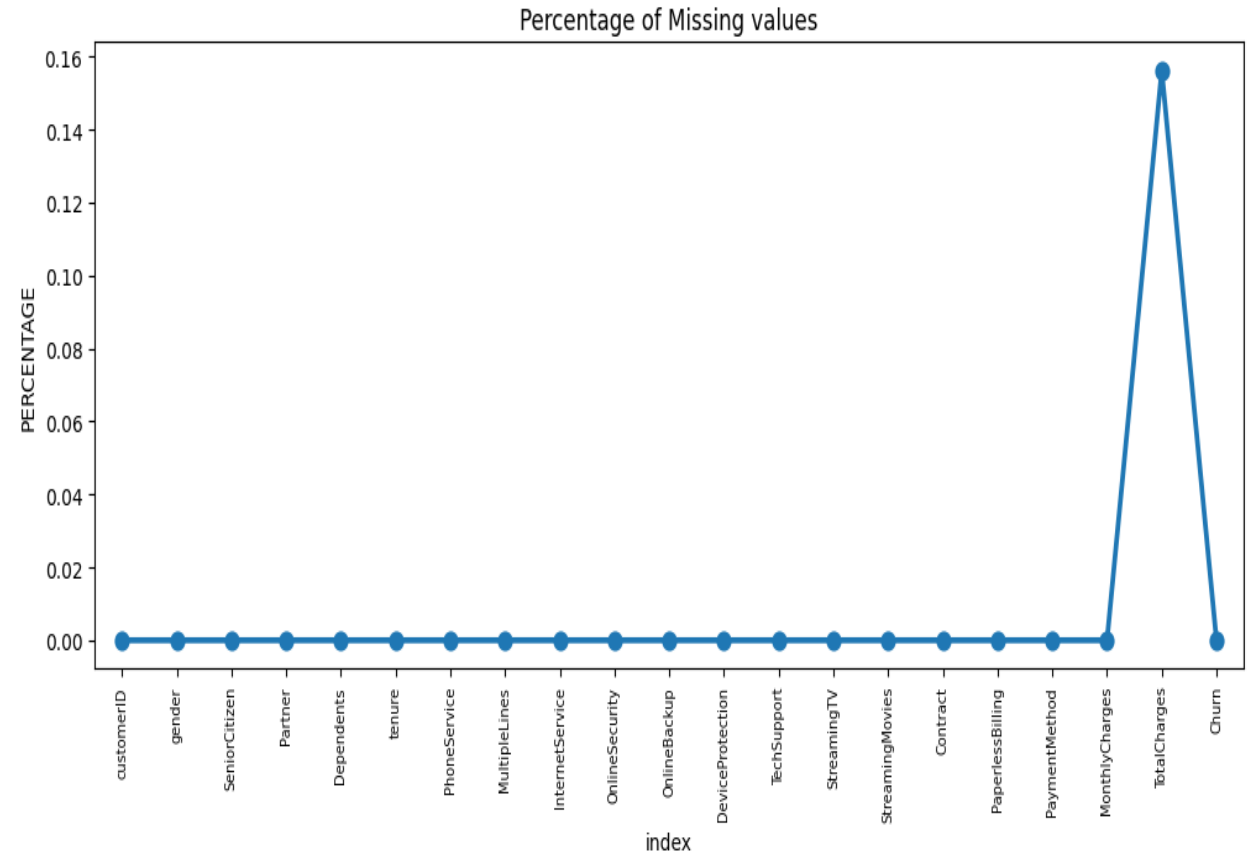
- **Data Understanding:** EDA helps us get to know our data better—its shape, its size, and what's inside.
- **Churn Identification:** We use EDA to count how many customers have left us (churned) and how many are sticking around. It's like taking attendance to see who's still here.
- **Feature Exploration:** EDA lets us peek at different things about our customers—like how much they use our services, how long they've been with us, and where they're from. We're looking for clues about what might make them leave.
- **Visualization and Analysis:** With EDA, we use charts and graphs to see if there are any interesting patterns or differences between customers who stay and those who leave. It's like spotting hidden treasures on a map..
- **Correlation Analysis:** EDA helps us see if there are any connections between different things about our customers and whether they leave or stay.

Understanding the data

Missing Data

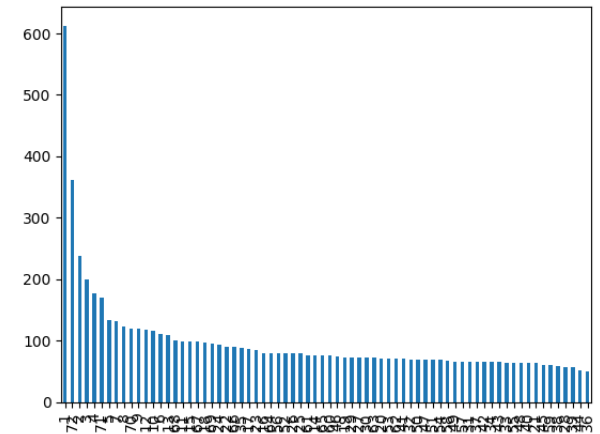
Findings

- One column (TotalCharges) have 0.15% missing values rest of the columns does not have any missing value.
- It shows TotalCharges has minimum missing values so we can handle by dropping the column.
- Another way is to treat by use of mean() or median().

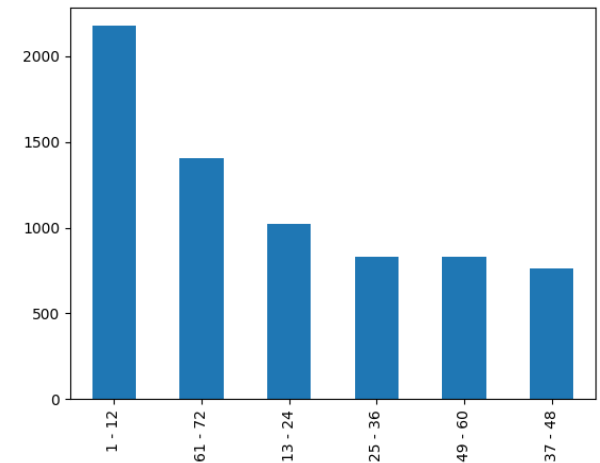


Data Cleaning

- The graph is about the counts of tenure which is very difficult to understand as it is too messy so we divide the tenure in bins of 12 months.



- In this graph the tenure is in 6 bins which is easy to understand the data.



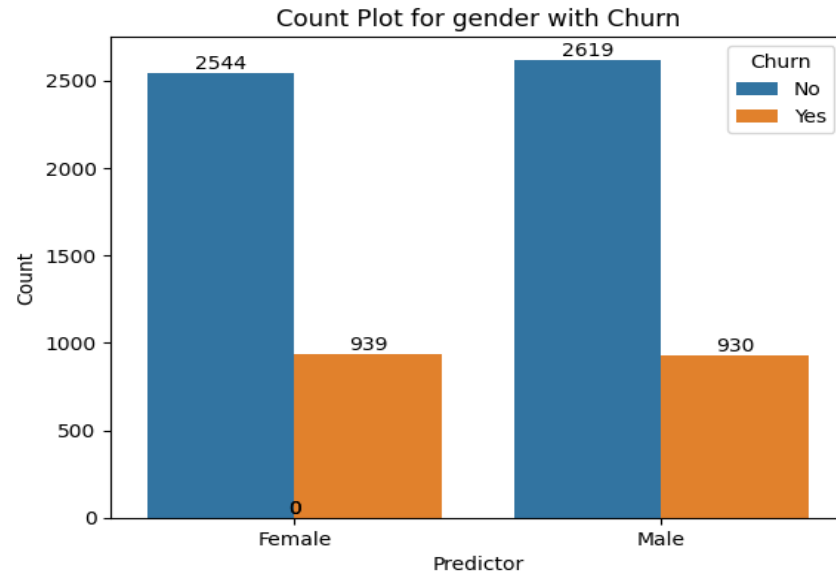
Dropping unnecessary columns

- After analysing the dataframe we have four numerical columns i.e. SeniorCitizen, Tenure, MonthlyCharges, TotalCharges.
- The SeniorCitizen data looks like numerical but it treated as categorical because its values are like 0 and 1.
- Now, we will drop the unnecessary columns i.e. CustomerID and tenure.
- After removing, we have all columns categorical except MonthlyCharges, TotalCharges.

Data Exploration-EDA

- Categorical Univariate Analysis : In this we will plot the graph and find the churn rate of each categorical column

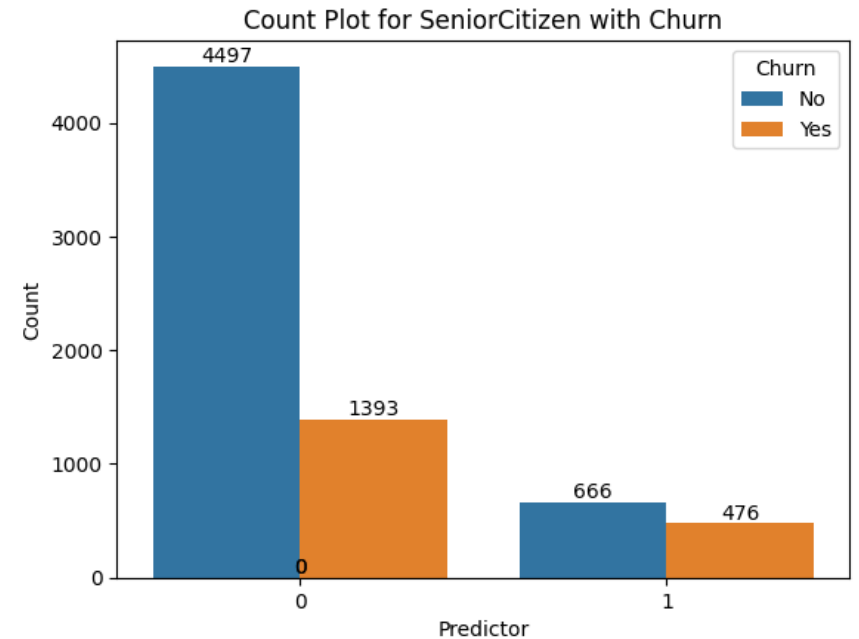
This Shows the churn with Gender and Senior Citizens



Churn rate of females: 26.95%
Churn rate of males :26.2%

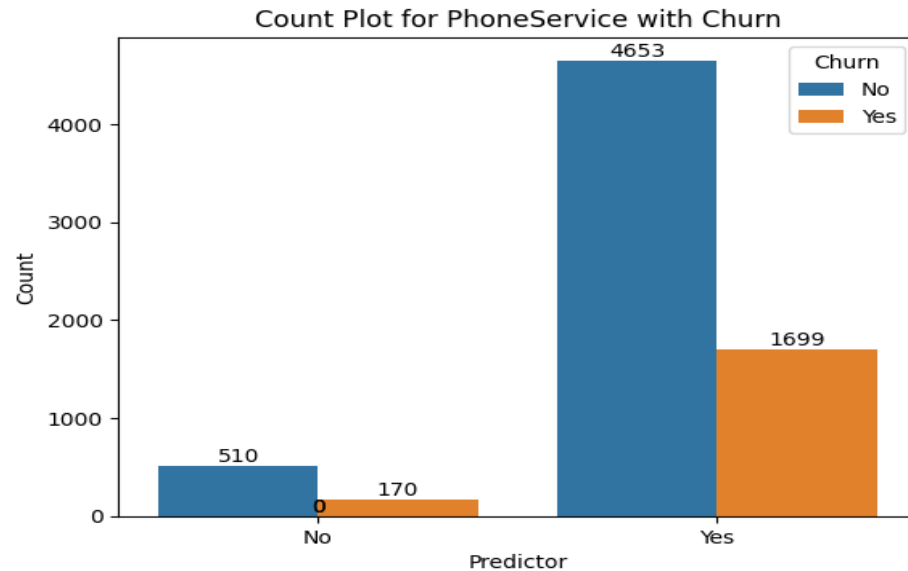
Insights:

- Irrespective of male and female both have equal percentage of churning.
- Senior Citizens are more likely to churn it shows peak insight.

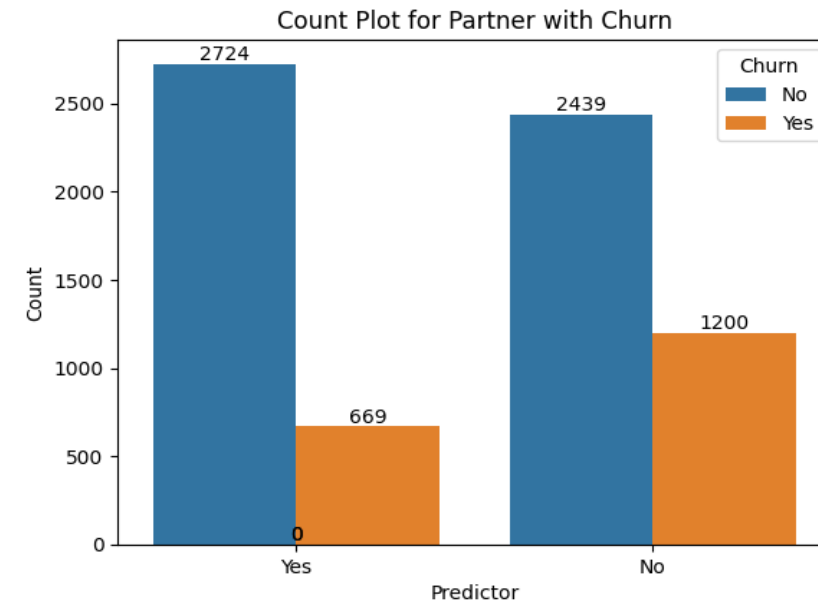


Churn rate of Youngsters:23.6%
Churn rate of SeniorCitizens:41.2%

Churn VS PhoneService



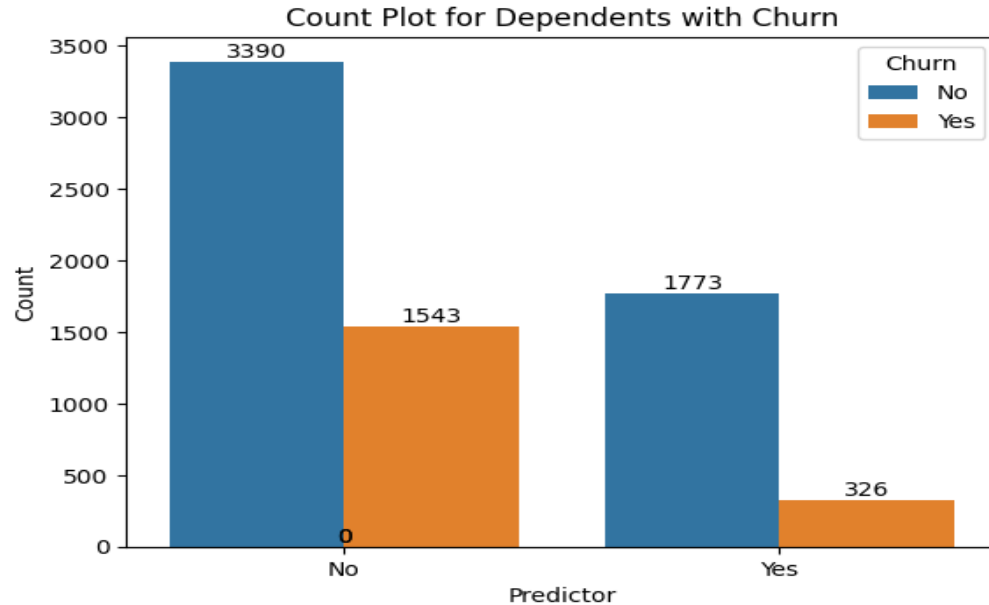
with partner & without Partner



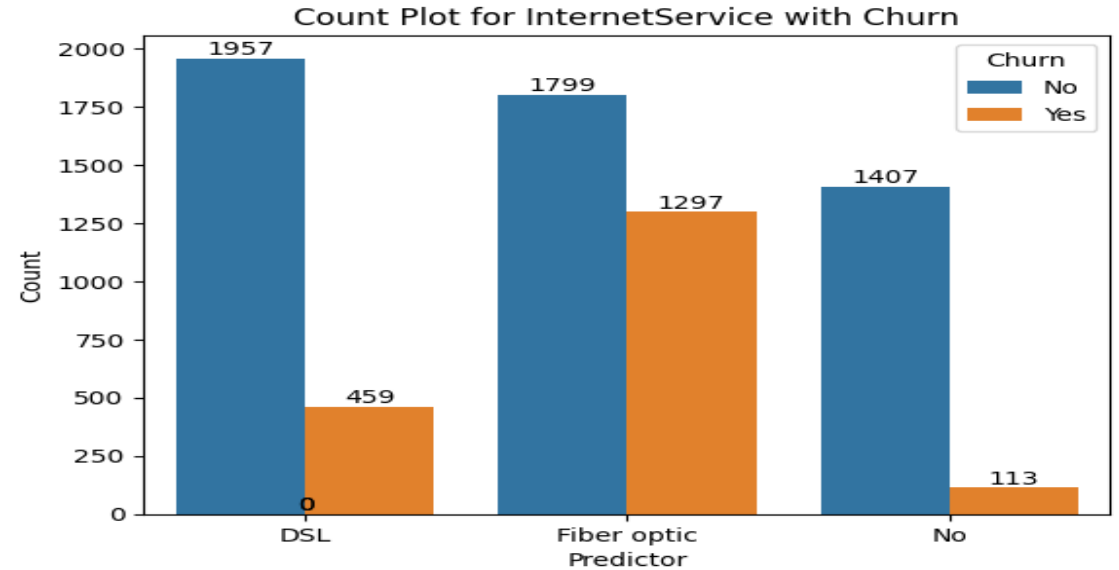
Findings

- Customers without phone service have a lower churn rate(25%) as compared to those with phone service (26.7%). Customers with a partner have a lower churn rate (19.7%) compared to those without a partner (32.9%).
- The difference in churn rates between having and not having a partner (13.2%) seems to be more substantial compared to the difference between having or not having phone service (1.7%). This indicates that the presence of a partner may have a stronger influence on customer retention than phone service.

Dependents vs non Dependent



Churn rate of Dependent: 31.2%
Non Dependent: 15.5%



Churn rate of internetService DSL:19%
Fiber Optics :42%
Without Any Service:7.43%

Findings:

- This suggests that dependency status might be a factor influencing churn, with dependent customers being more likely to churn.
- The difference in churn rates between customers using fiber optics and those using DSL is substantial (23%). This suggests that the type of internet service plays a significant role in churn behavior, with fiber optics customers being at a higher risk of churn.

MultiLines vs churn and OnlineBackup Vs Churn

Churn rate without MultipleLines:25%

with multipleLines:28.6%

With no phone services:25%

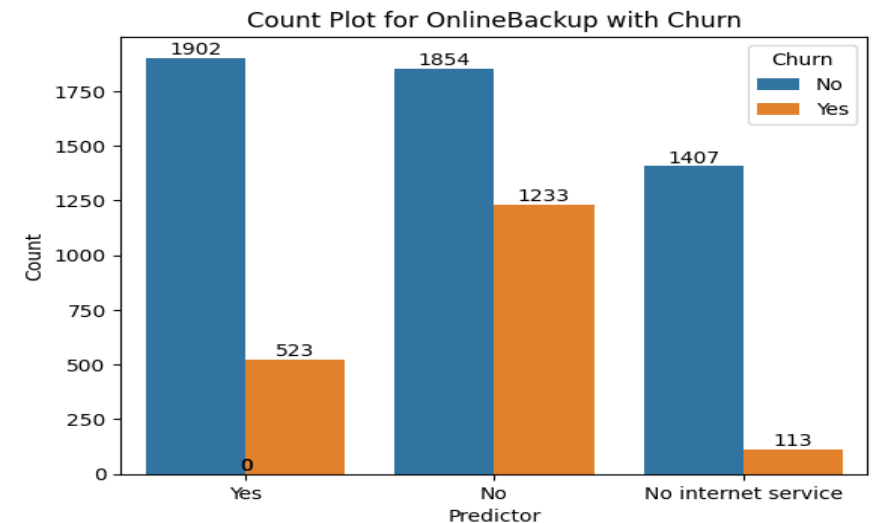
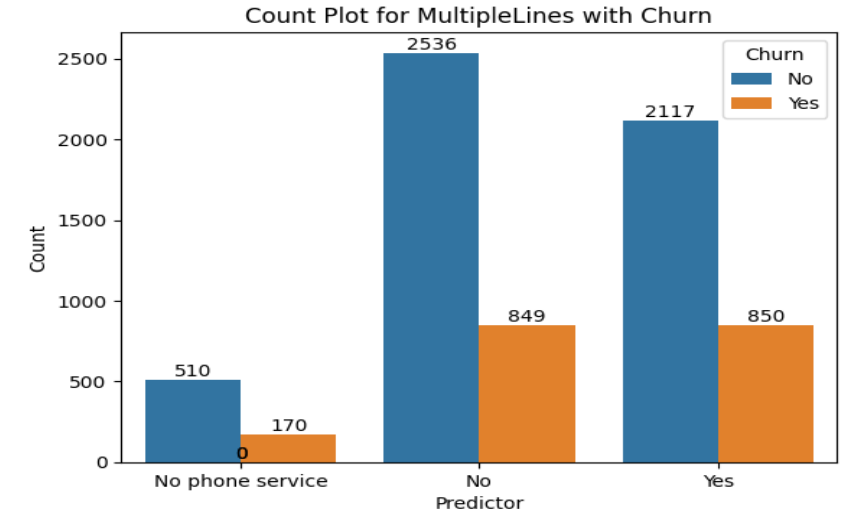
Churn rate with OnlineBAckup: 21.55%

Without OnlineBackup:39.94%

No internetService:7.4%

Findings

- This indicates that the no MultipleLines and absence of phone service may not significantly impact churn rate when compared directly with having multiple lines.
- The difference in churn rates between customers with and without online backup is significant (18.39%). This suggests that online backup services may play a crucial role in retaining customers.



Online Security vs Churn and DeviceProtection Vs Churn

Churn Rate without onlineSecurity:41.7%

With OnlineSecurity:24.6%

With no internet service:7.43%

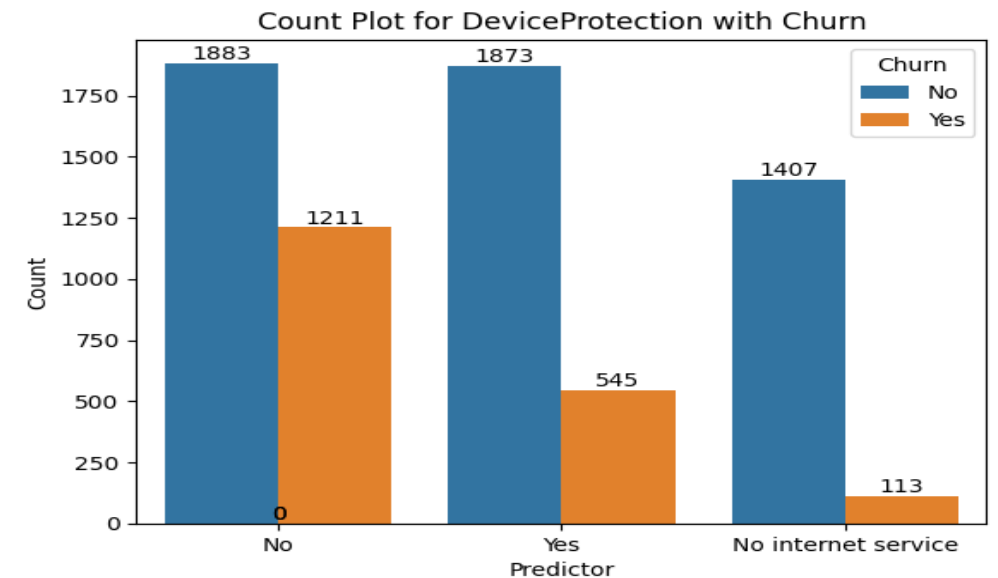
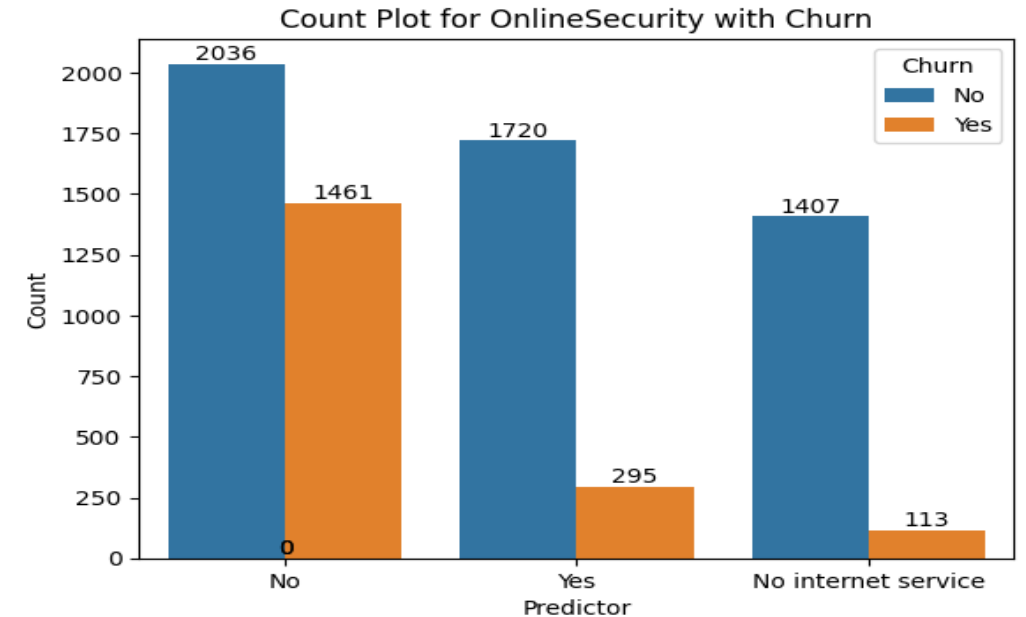
Churn rate without DeviceProtection:39%

With DeviceProtection:22.5%

With no internet service:7.43%

Insights:

the importance of offering and promoting services like OnlineSecurity and DeviceProtection to reduce churn. Additionally, customers without internet service demonstrate significantly lower churn rates overall.



StreamingTV VS Churn and TechSupport VS Churn

Churn Rate without StreamingTv:33.53%

With StreamingTV:30.11%

No internet service: 7.4%

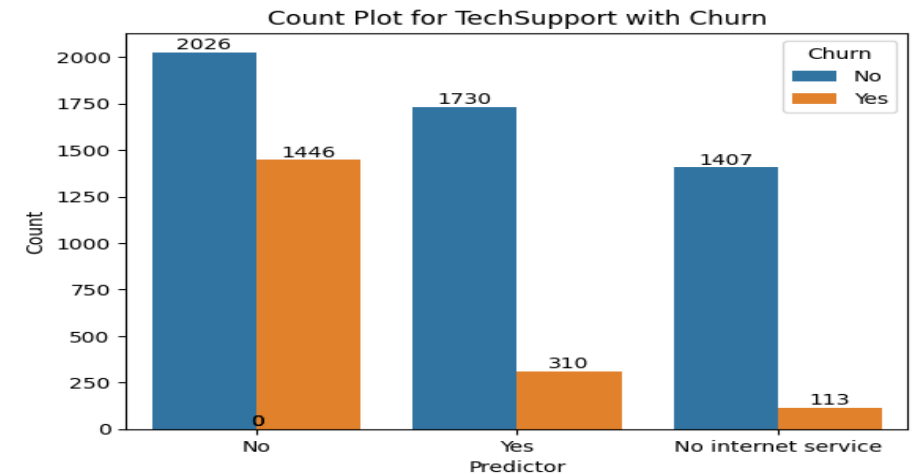
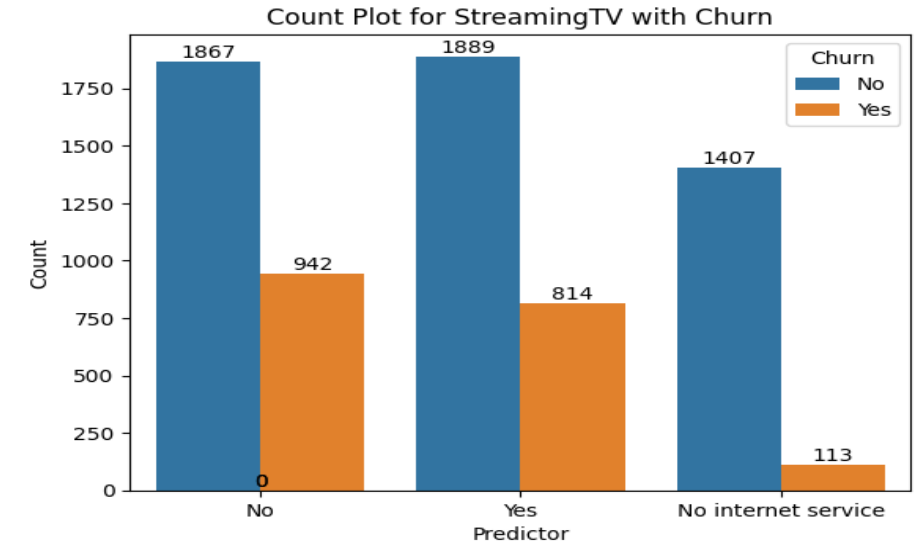
Churn Rate without Techsupport:41.6%

With Techsupport:15.19%

No internet service:7.43%

Insights:

StreamingTV may not have a substantial impact on churn rate, offering TechSupport can significantly reduce churn. Additionally, the data highlights the importance of internet service, with customers without internet service demonstrating consistently lower churn rates.



Contract vs Churn and Paperlessbilling VS churn

Churn Rate with Month-to-month contract:42.70%

One-year contract:11.27%

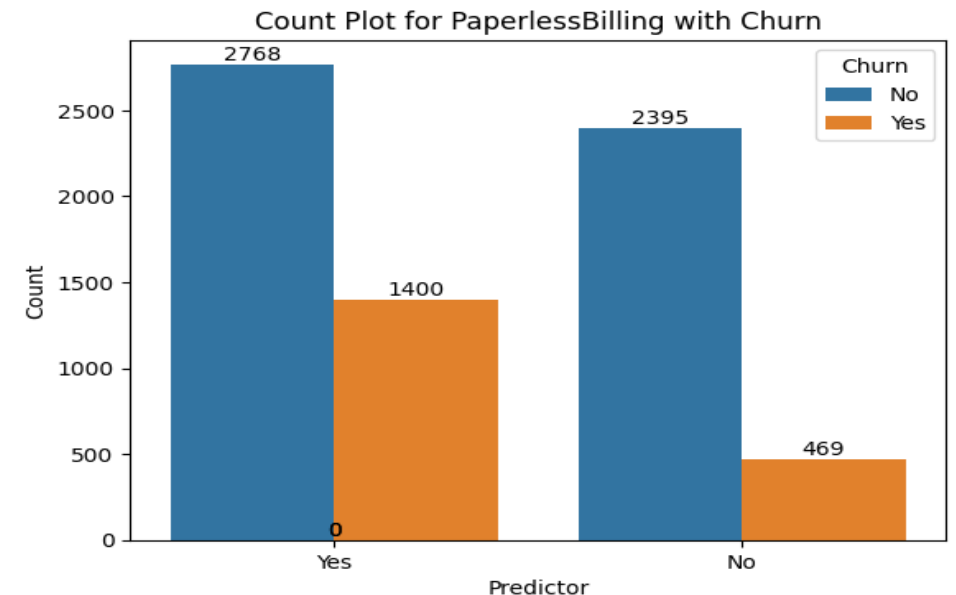
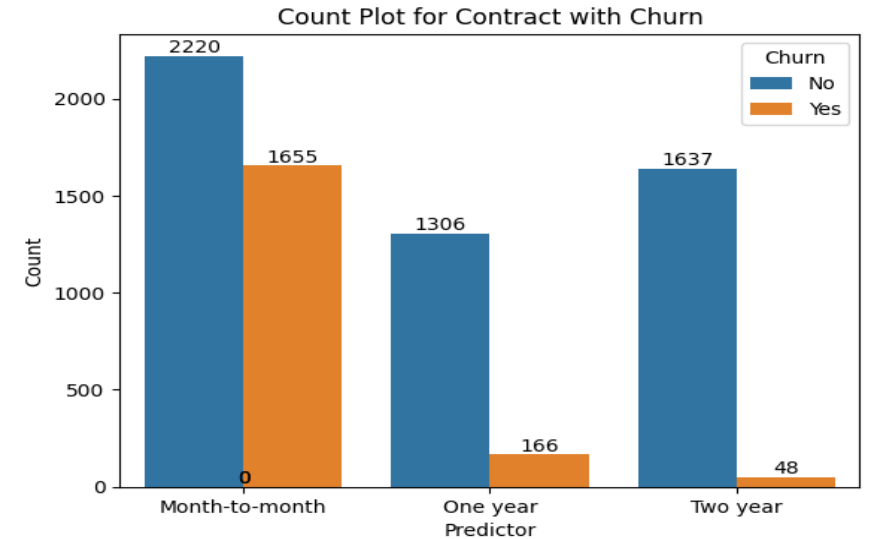
Two-year contract:2.8%

Churn rate with paperlessbilling:33.5%

Without Paperlessbilling:16.3%

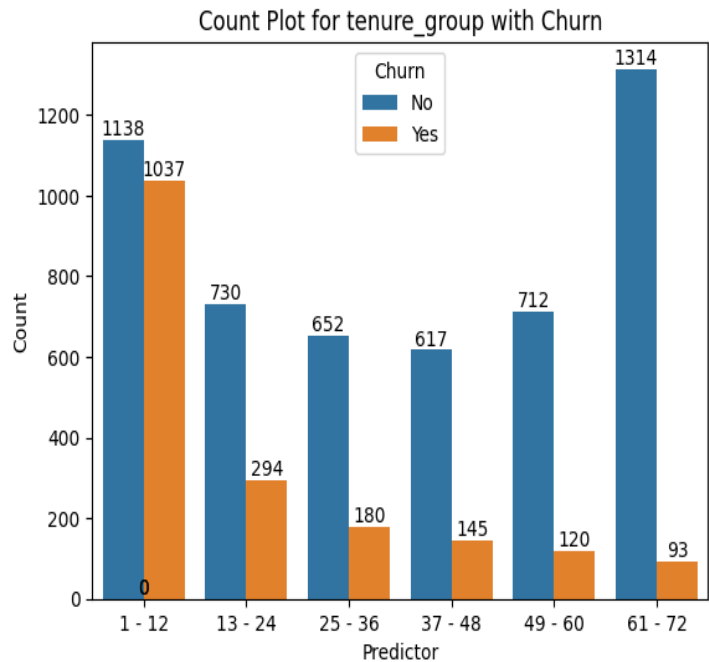
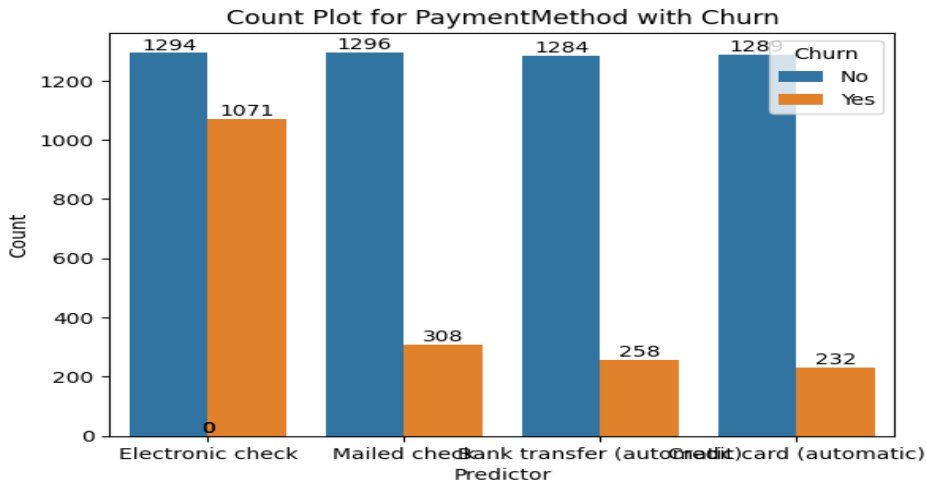
Insights:

This suggest that offering longer contract options and encouraging non-paperless billing methods could help reduce churn rates for the business. Customers seem to prefer longer-term commitments and traditional billing methods for increased retention.



PaymentMethod Vs Churn & Tenure_group VS Churn

Churn rate with Electronic check:45.2%
mailed check:19.20%
Bank transfer:16.7%
Credit Card:15.25%



Churn with tenure 1-12:47.6%
13-24: 28.7%
25-36: 21.63%
37-48: 19%
49-60: 14.42%
61-72: 6.6%

Insights:

- The churn rate is highest for customers with tenure between 1-12 months and lowest for those with tenure between 61-72 months.
- Electronic check users exhibit the highest likelihood of churning, while credit card users show the lowest likelihood.

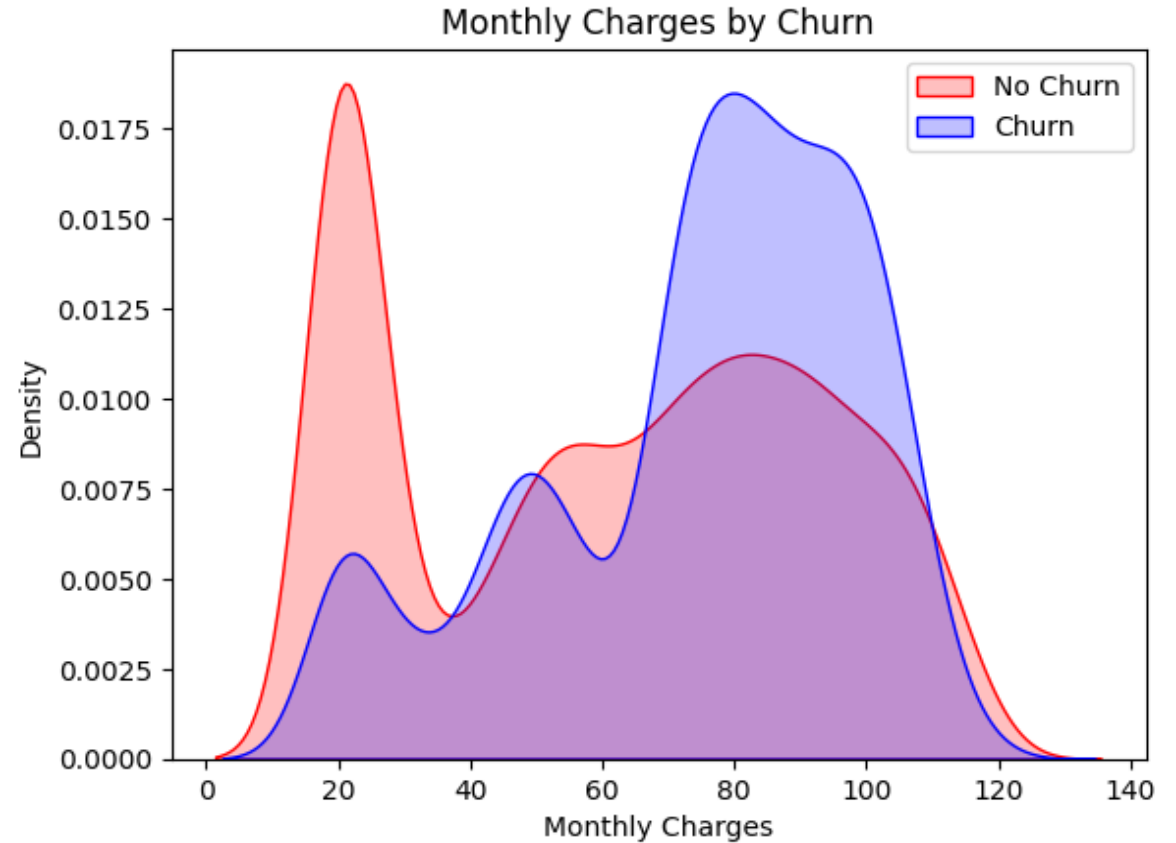
Numerical Univariate Analysis

- Do Churn Analysis with the Numerical columns such as MonthlyCharges and TotalCharges

Churn Analysis with MonthlyCharges

Insights

- It shows that are high churn rate is increasing when the Monthlycharges are increasing.
- It may be beneficial for the company to review its pricing plans and offerings to ensure they align with customer expectations and provide value that justifies the cost, thus potentially reducing churn rates associated with high monthly charges.



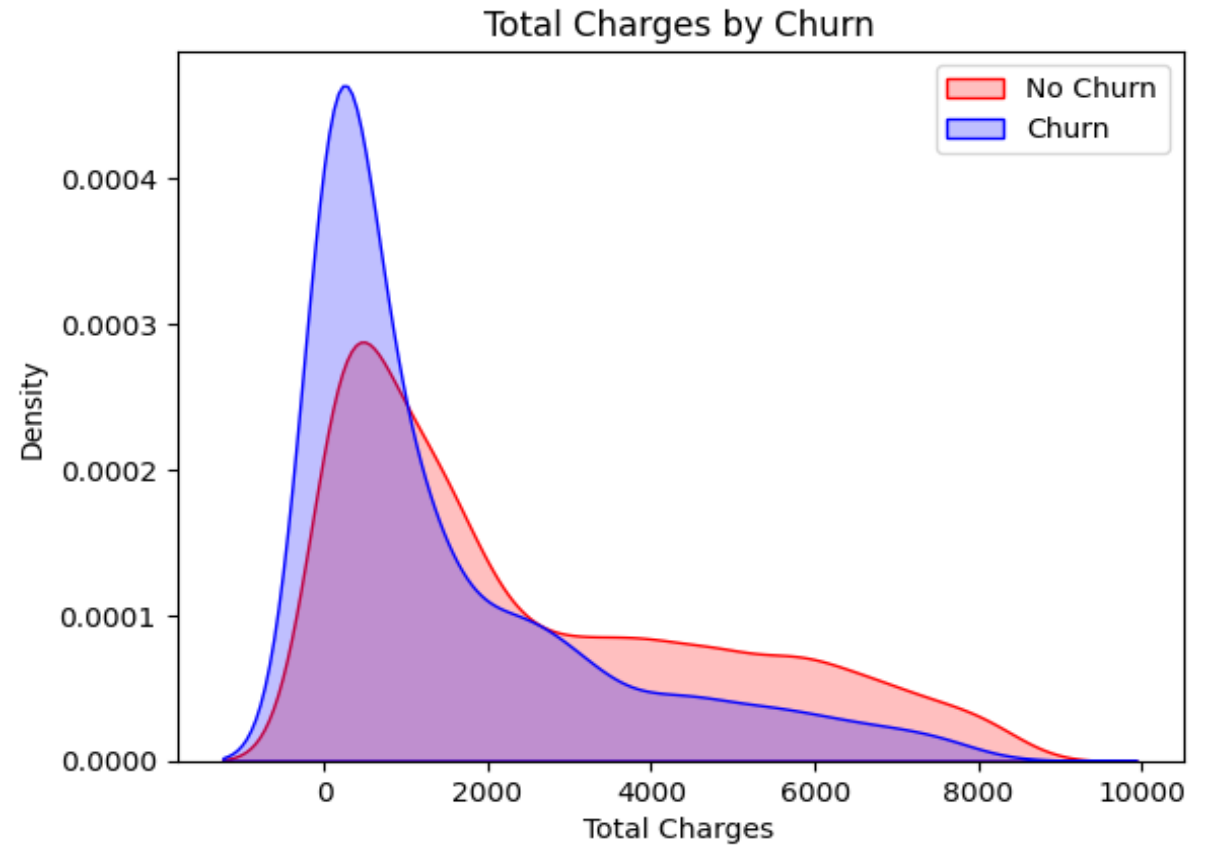
Churn Analysis with TotalCharges

Insights

- When the TotalCharges is less ,the churn rate is high. Customers who have spent less with the company are more likely to churn. It's possible that these customers are less engaged or satisfied with the service, leading to higher churn.
- With the rise in TotalCharges,churn rate is less. Customers who have spent more with the company are less likely to churn. They may have developed stronger relationships with the company, have more invested in the service, or perceive higher value, leading to lower churn rates.

Good Findings

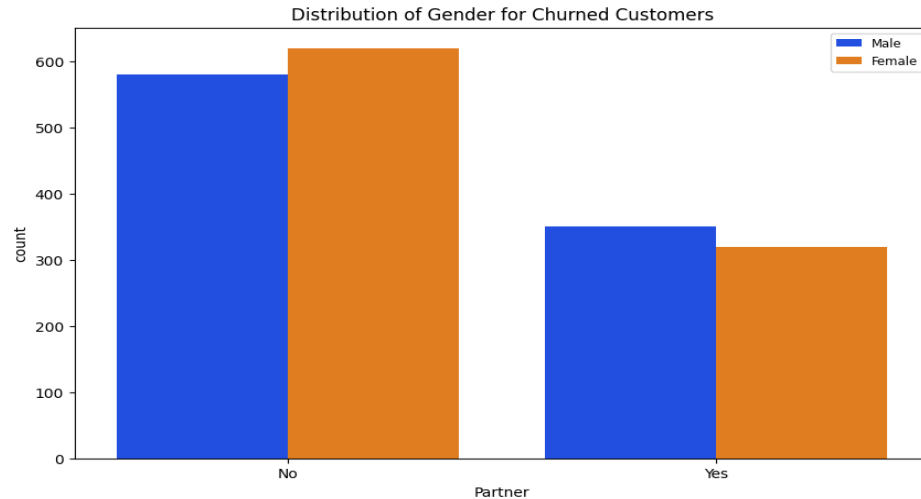
Churn Rate is high when MonthlyCharges are more, TotalCharges are less and Tenure is less.



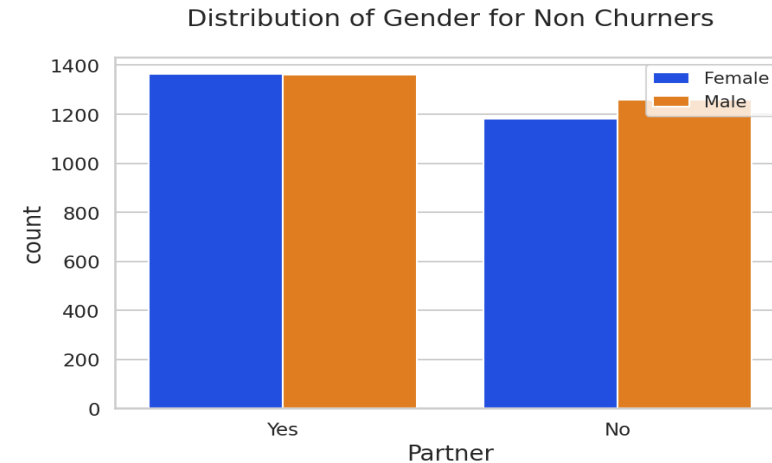
Bivariate Analysis

- Do Analysis each and every column with one column

Distribution of Gender and Partner for Churned and Non Churned



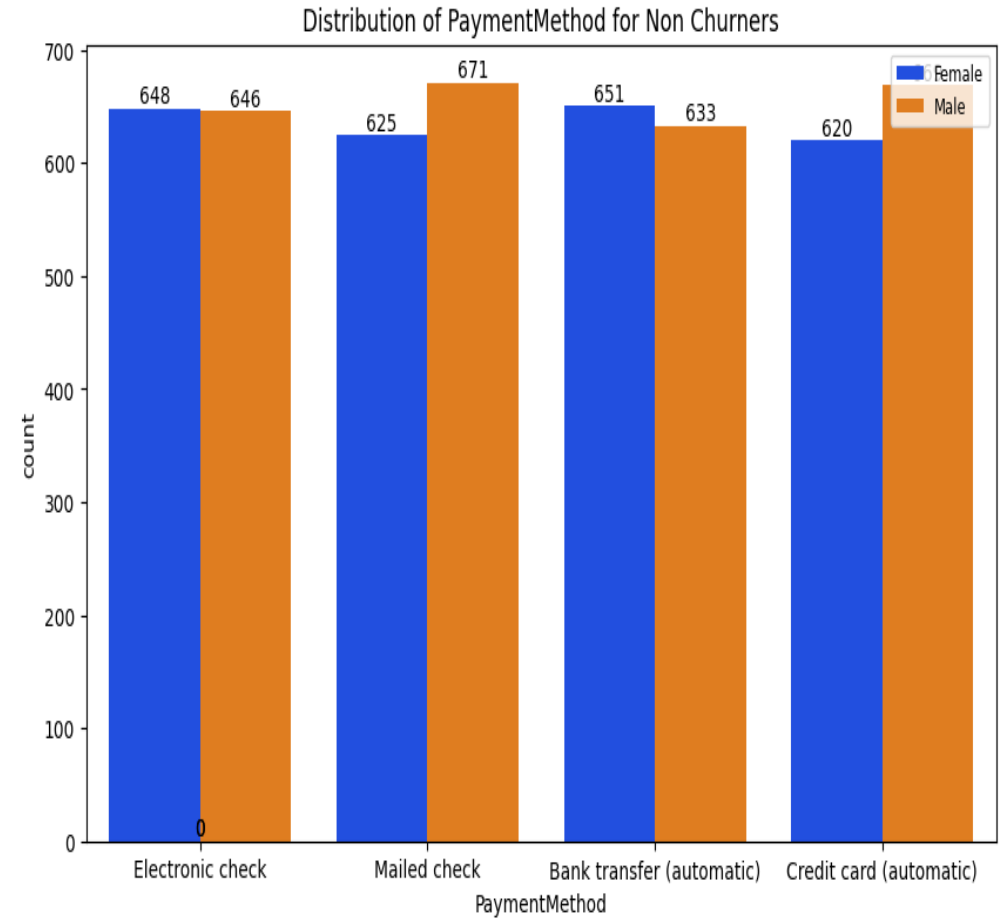
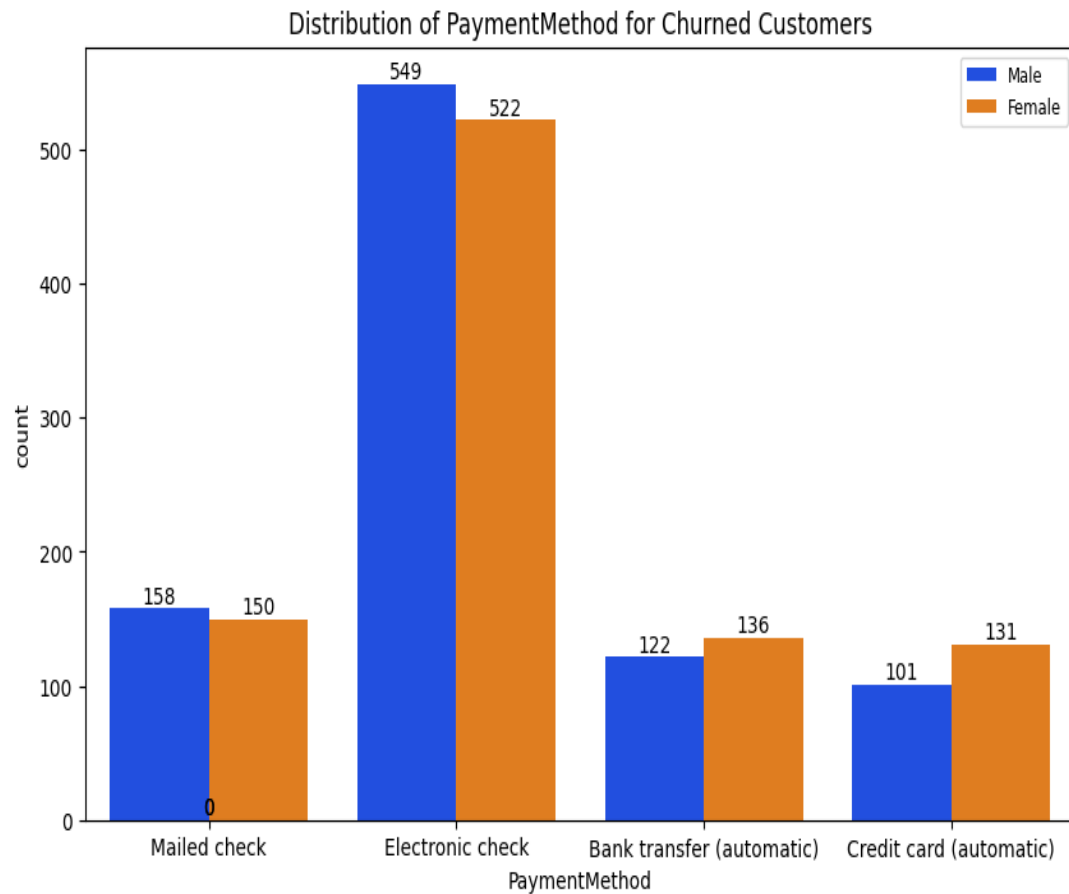
Churn Rate of Male with Partner:20.4%
Male with no Partner:31.6%
Female with Partner:18.56%
Female with no Partner:35.88%



Insights:

Both male and female with a partner exhibit lower churn rates compared to those without a partner. Females without partner are more likely to churn.

Distribution of Gender and PaymentMethod for Churned and Non Churned



Findings

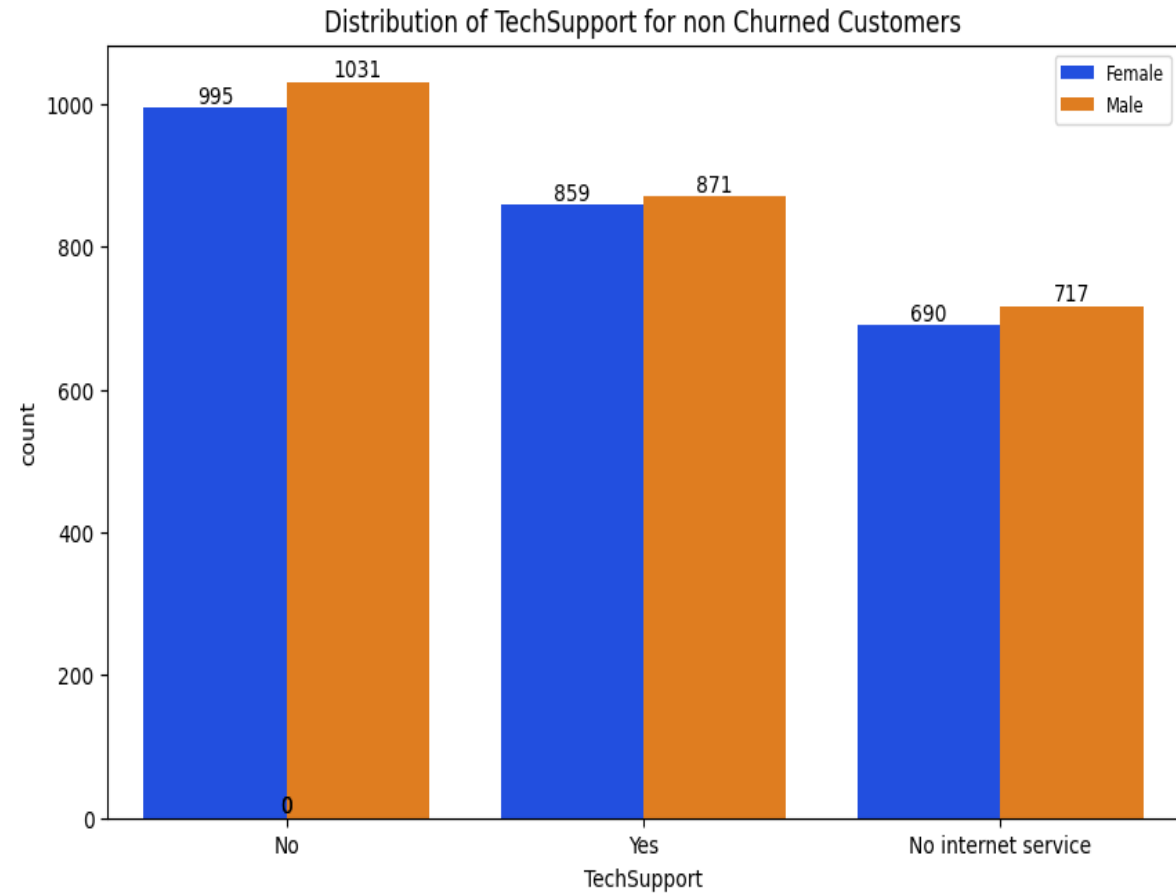
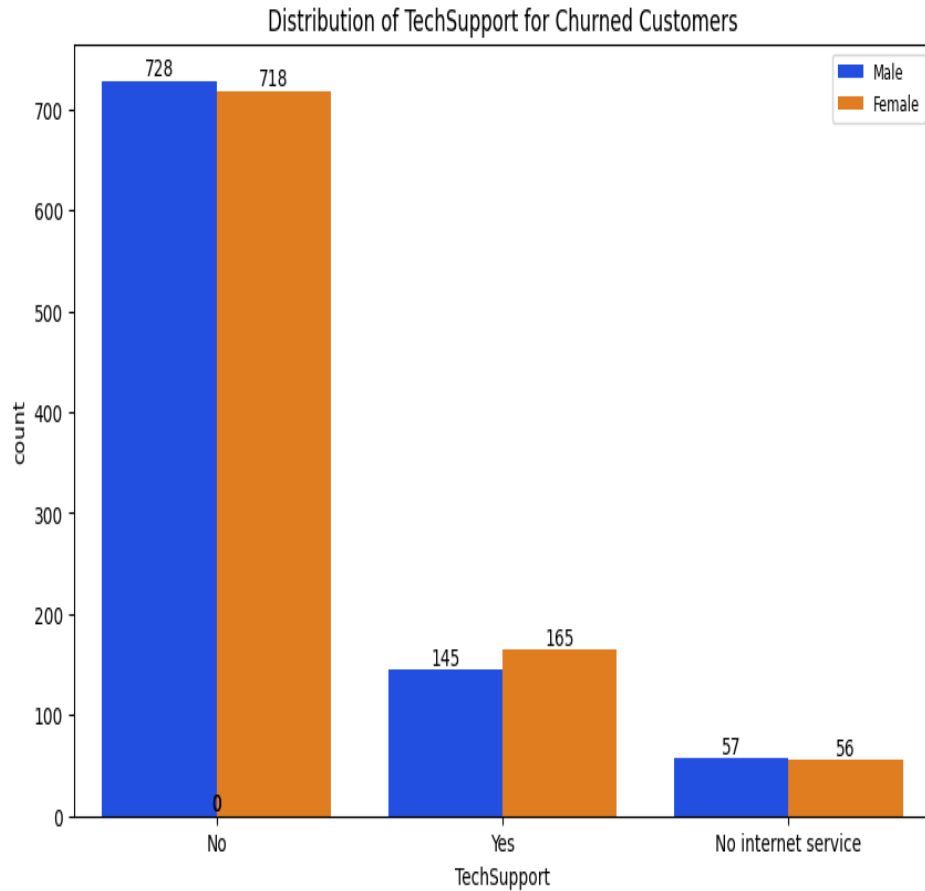
- Churn Rate Of Female PaymentMethod with Mailed check:19.3%
- Electronic Check:44.6%
- BankTransfer:17.2%
- Credit Card:17.4%

- Churn Rate Of Males PaymentMethod with Mailed check:19%
- Electronic Check:45.9%
- BankTransfer:16.1%
- Credit Card:13.2%

Insights:

- Both male and female customers exhibit similar patterns of churn rates across different payment methods.
- For both genders, the highest churn rates are associated with Electronic Check payments, while the lowest churn rates are associated with Credit Card payments.
- There are slight differences in churn rates between genders for each payment method, but the overall pattern remains consistent.

Distribution of Gender and TechSupport for Churned and Non Churned



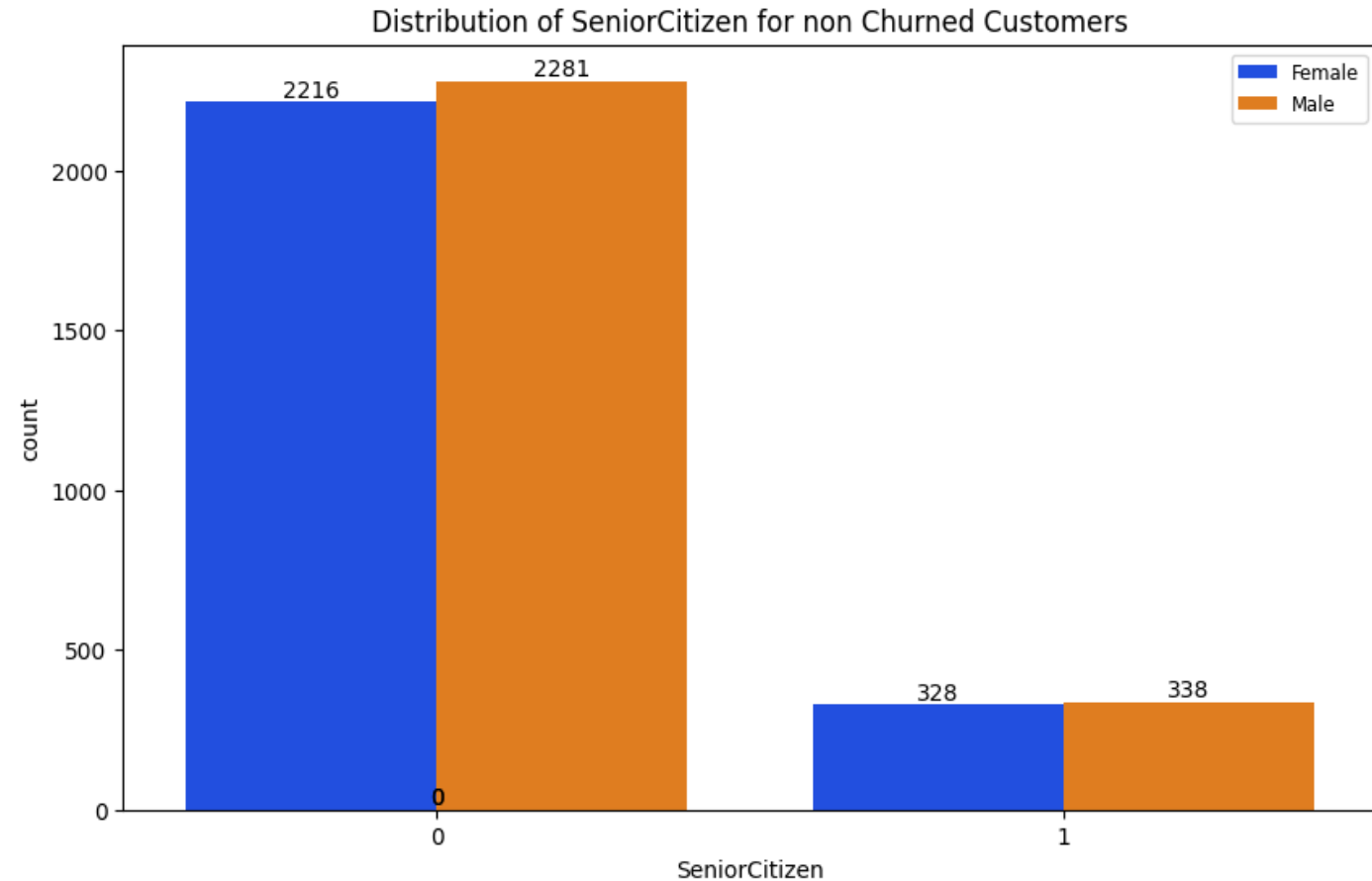
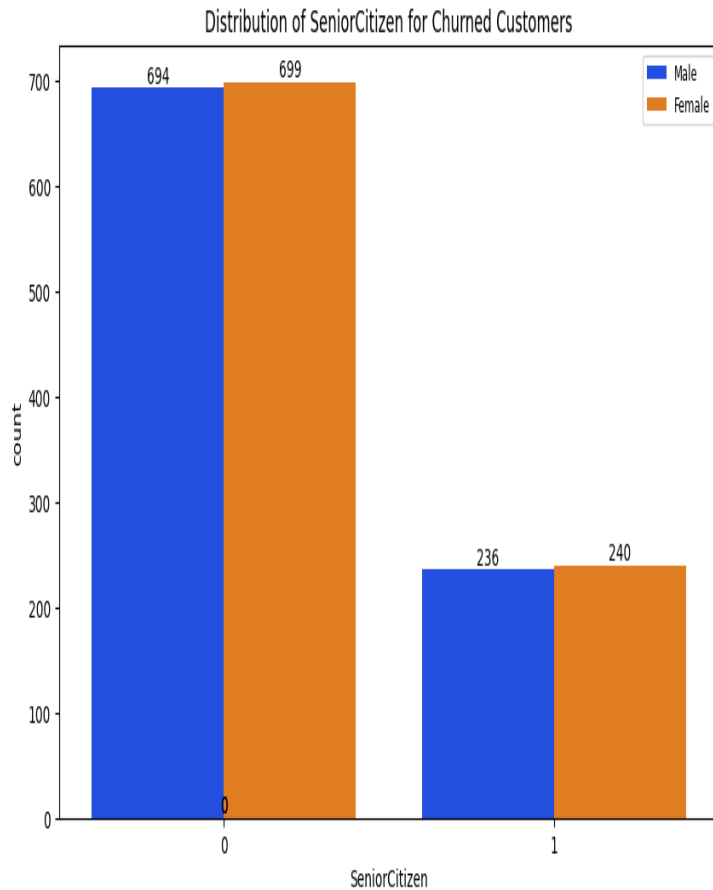
Findings

- Churn Rate of males without TechSupport:41.3%
- With TechSupport:14.2%
- No internetService:7.3%
- Churn Rate of females without TechSupport:41.9%
- With TechSupport:16.1%
- No internetService:7.5%

Insights:

- Both male and female customers exhibit significantly lower churn rates when they have TechSupport compared to when they don't.
- The churn rates for male and female customers without TechSupport remain comparable, with slightly higher churn rates for females.
- Regardless of gender, customers with no internet service still have the lowest churn rates.

Distribution of Gender and SeniorCitizen for Churned and Non Churned



Findings

Churn Rate of males no SeniorCitizen:23.3%
males SeniorCitizen: 41.1%

Churn Rate of females no SeniorCitizen :23.9%
Females SeniorCitizen :42.2%

Insights:

Both male and female SeniorCitizens exhibit significantly higher churn rates compared to those who are not SeniorCitizens.