

EXPLORATORY DATA ANALYSIS (EDA)

REPORT

ON CUSTOMER CHURN ANALYSIS

Business Understanding (Churn Analysis)

Customer churn is a critical challenge faced by many businesses, particularly in competitive industries like telecommunications. High churn rates can lead to significant revenue loss and increased customer acquisition costs. Understanding the driving factors behind customer churn is essential for developing effective retention strategies.

The goal of this Exploratory Data Analysis (EDA) project is to investigate the customer churn dataset to identify patterns, trends, and key factors influencing customer churn. By analyzing various attributes such as demographics, service usage, customer support interactions, and contract details, the project seeks to uncover the underlying reasons for churn. The insights derived from this analysis will be presented in a comprehensive report, aimed at helping stakeholders better understand churn behavior and inform future retention strategies.

The project will focus on:

1. Identifying the most significant factors contributing to churn.
2. Exploring correlations between customer demographics, services, and churn behavior.
3. Visualizing key insights to present a clear narrative on the drivers of churn.
4. Providing actionable insights to reduce churn and improve customer retention.

Understanding the data

This dataset contains customer information from a telecom company, with 22 columns and 7048 rows representing various customer attributes and records.

Below are the key features:

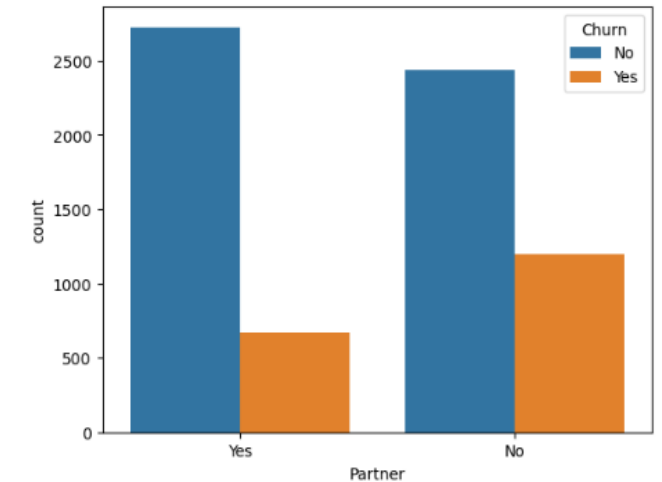
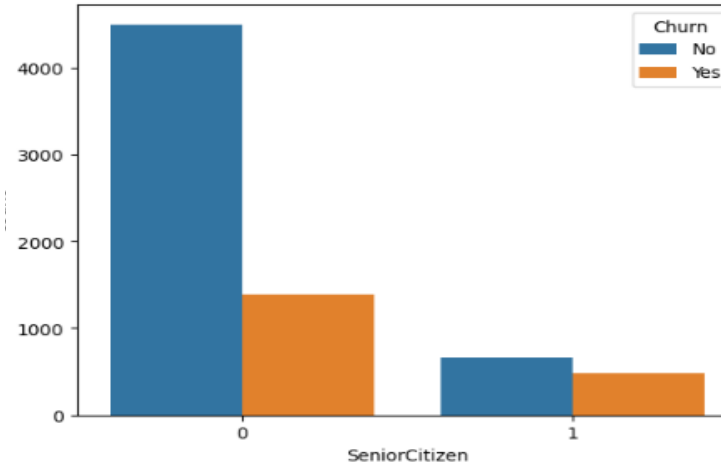
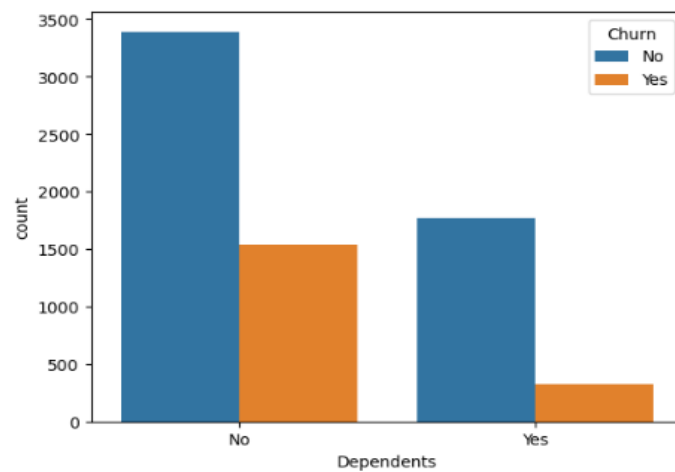
- **CustomerID:** A unique identifier for each customer.
- **Demographics:** Includes gender and whether the customer is a senior citizen.
- **Customer Relationships:** Details like whether the customer has a partner or dependents.
- **Services:** Information on services such as Phone Service, Multiple Lines, Internet Service, and add-ons like Online Security, Online Backup, Device Protection, and Streaming (TV and Movies)
- **Contract Details:** Describes the type of contract (e.g., Month-to-month, One year), whether the customer has opted for paperless billing, and their payment method.
- **Financial Data:** Includes MonthlyCharges and TotalCharges.
- **Tickets:** Number of admin and technical tickets generated by the customer.
- **Churn:** A binary indicator showing whether the customer has churned (left the service) or not.

Data Intuition-Missing Data & Data Cleaning

Findings:

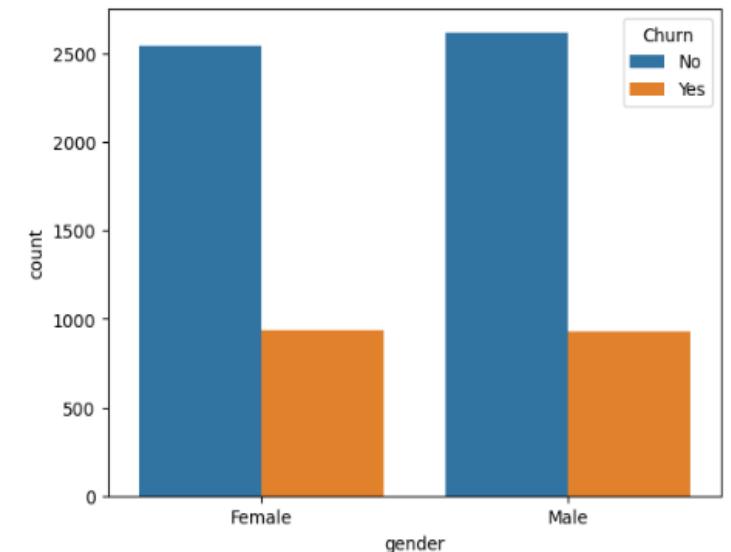
- **No Missing Data Initially:** The original dataset had no missing values, making it easier to start with.
- **TotalCharges Data Type Fix:** The Totalcharges column was incorrectly formatted as a string. We converted it to a numeric data type for accurate analysis.
- **Handling Missing Values:** After converting Totalcharges to numeric, we found 11 missing values. These account for only **0.15%** of the dataset, so they were ignored to prevent unnecessary complications in the analysis.
- **Tenure Binning:** Customers were grouped into tenure bins for better segmentation. Categories include 1-12 months: for customers with less than 12 months of tenure 13-24 months: for those between 1 and 2 years, and so on.
- **Data Simplification:** Unnecessary columns like **customerID** and the original **Tenure** were removed from the dataset to streamline processing and focus on relevant features.

Analysis and Findings

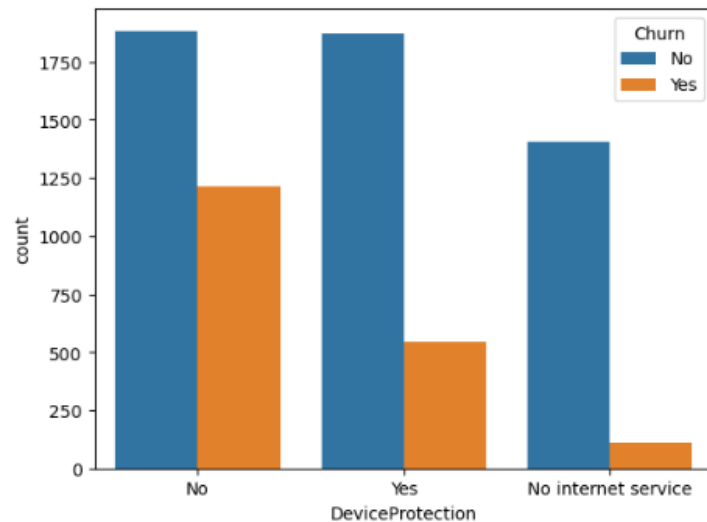
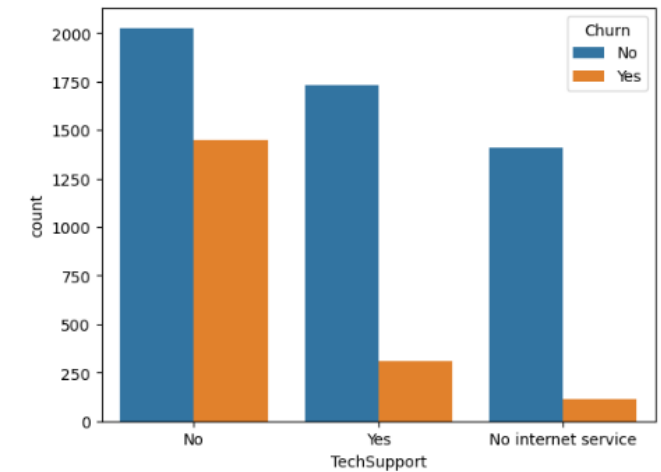
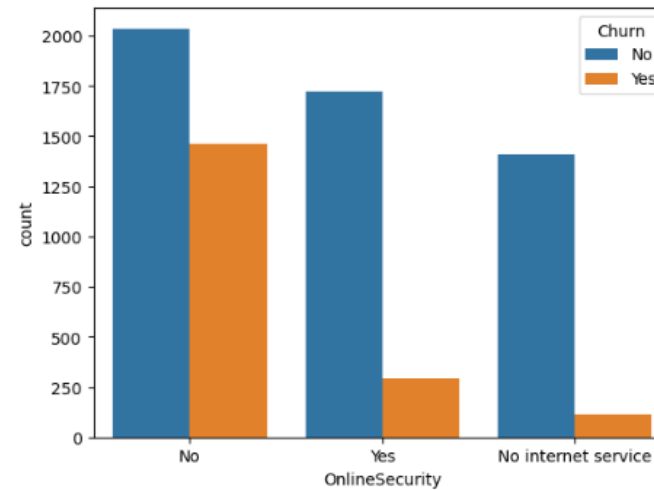
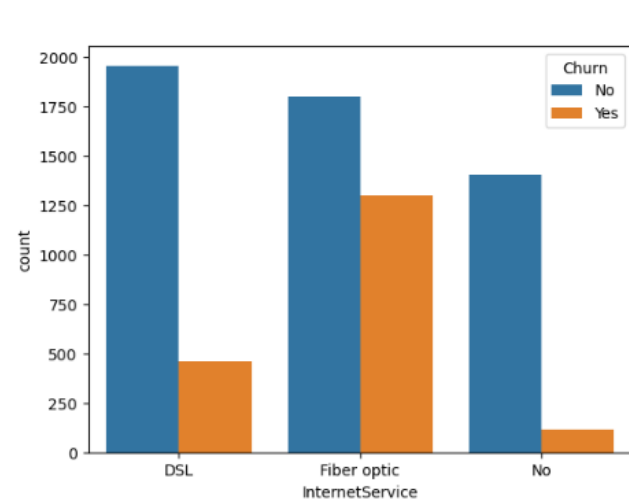


■ Key Insights from Univariate Analysis

- **Equal Churn Rate Across Genders-** Indicating that gender is not a significant predictor of churn.
- **Senior Citizens More Likely to Churn:** Customers who are senior citizens exhibit a higher churn rate compared to younger customers.
- **Customers who do not have partners are more likely to churn,** suggesting that single customers may be less loyal.
- **Customers without dependents also show a higher propensity to churn,** indicating that family commitments might reduce churn risk.



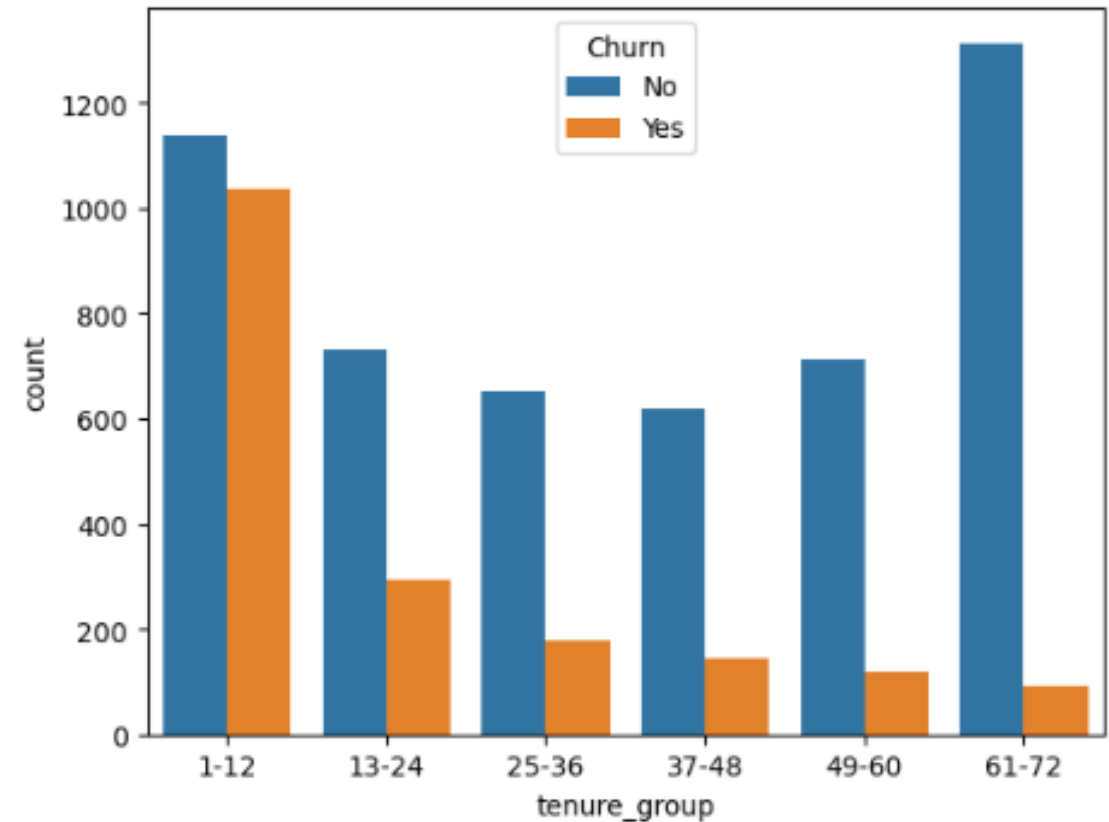
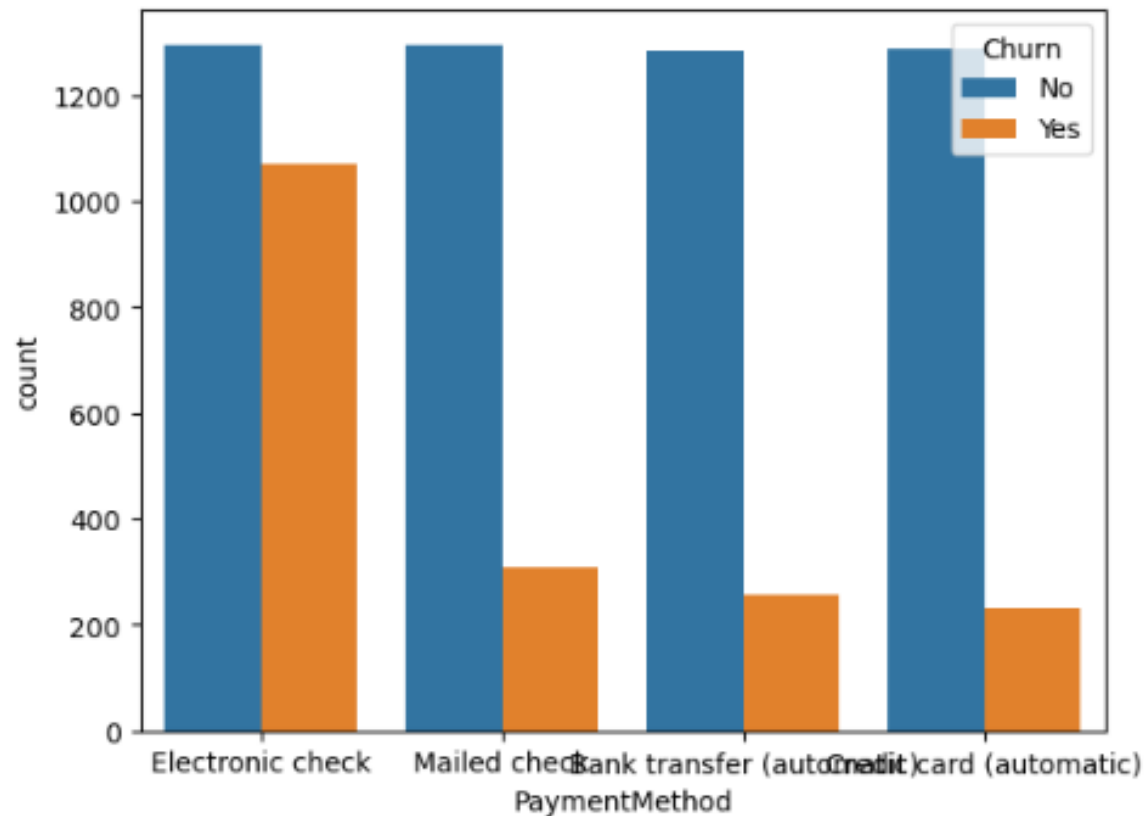
Customer Service Analysis



Key Insights:

- 41% of Fiber Internet Users are Churners
- There is an increased Churn rate of Customers Without Online Security service.
- Customers using one or more streaming services (TV or movies) are more likely to churn, possibly indicating dissatisfaction with services.

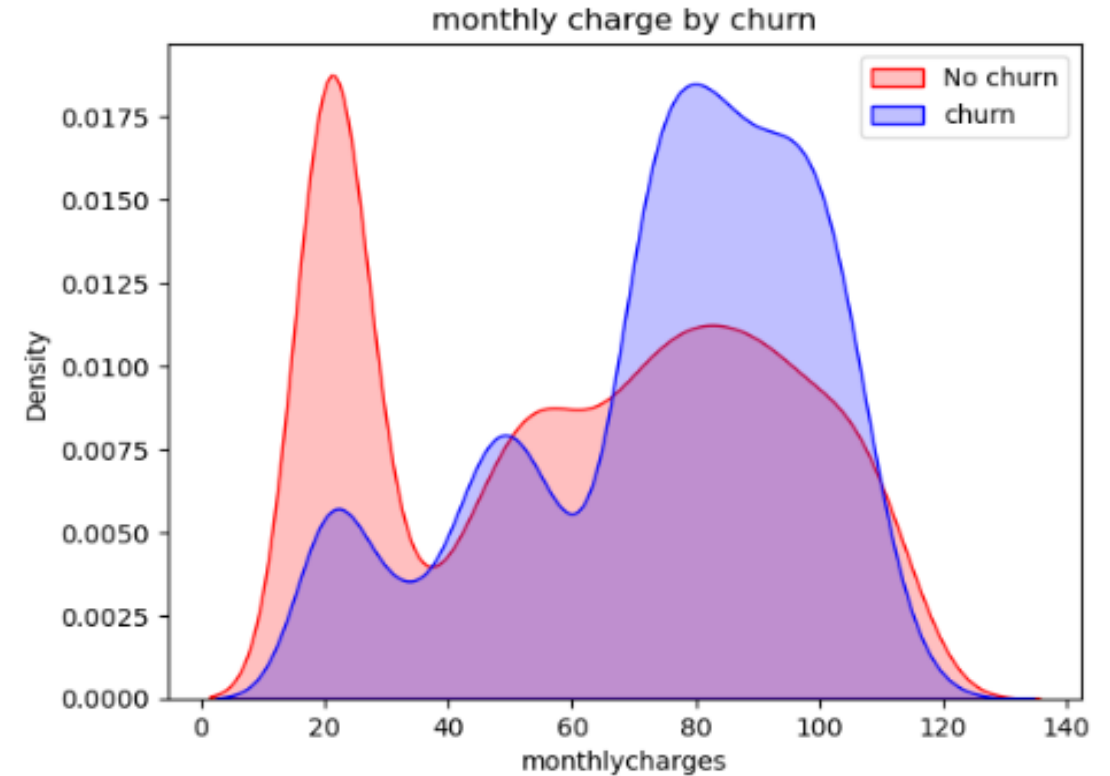
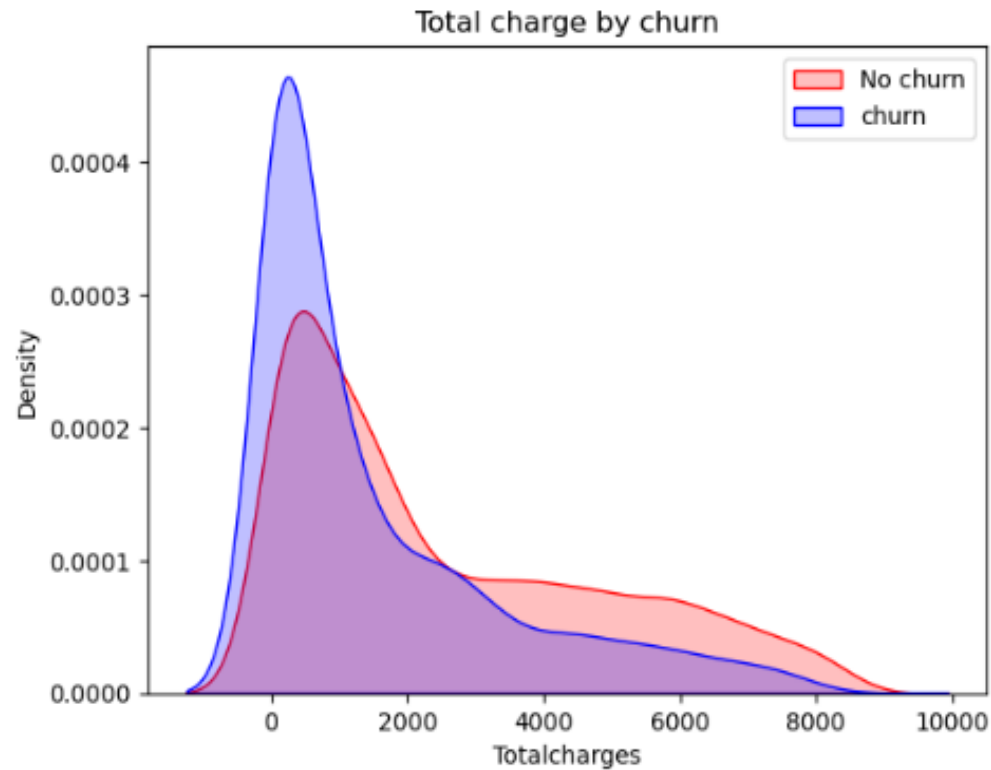
Payment method & Tenure group VS Churn



Key Insights:

- Customers that pay through Electronic checks are the highest churners with about 46 % churn rate compare to other payment methods with less than 15% rate
- Customers that are a year old or less are high churners (close to 50% churn rate) compared to older customers

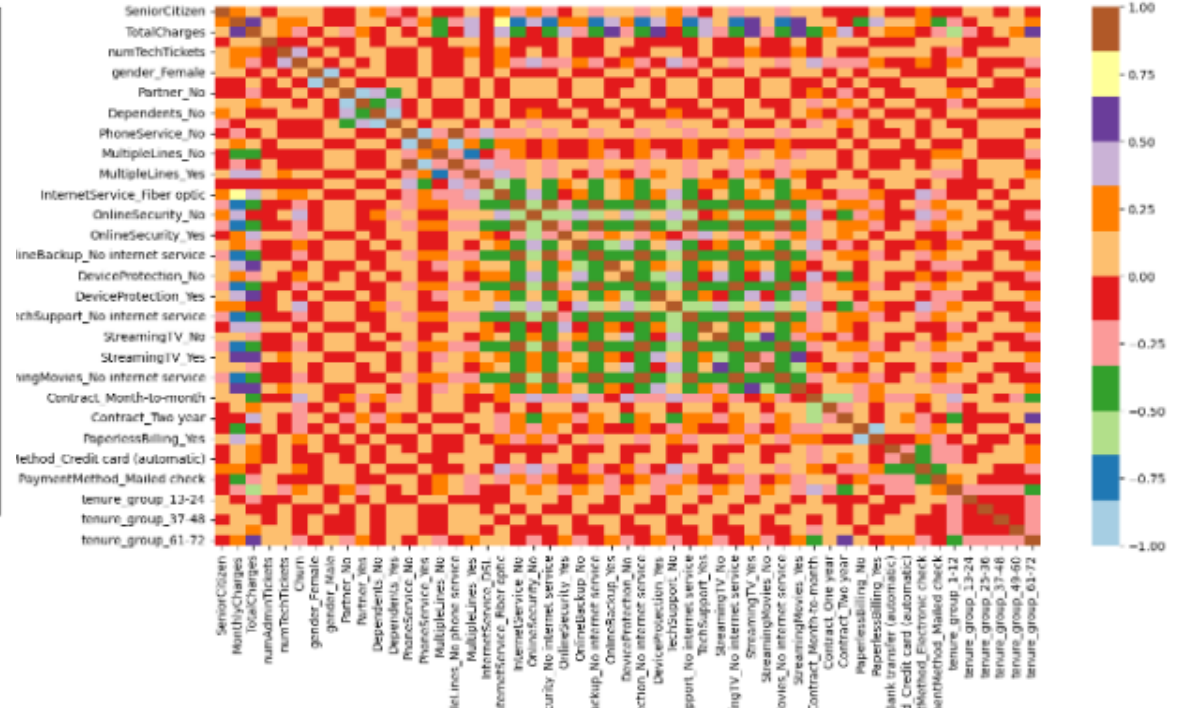
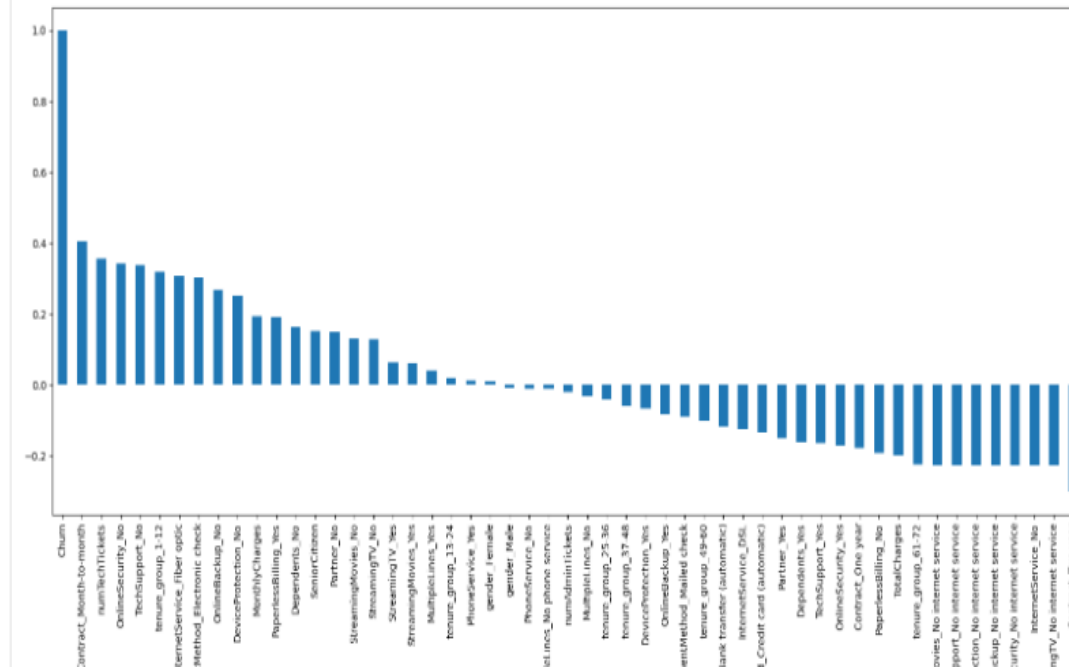
Totalcharges & Monthlycharges VS Churn



■ Key Insights:

- Churn is high when monthly charges is high
- Churn is high when Total charges is low. This might be a little bit surprising at first. However, monthly charge at low tenure result into lower Total charge. Hence, factors including High monthly charge, lower tenure, and lower total charge are all linked to high churn rate

Correlation Analysis of Predictors VS Churn



- **Key Insights:**
- HIGH CHURN seen in case of **month-to-month, online_security, No_tech_support, fibre_optic_internet,first_year_of_support**
- LOW CHURN: seen in case of **Longterm contract,subscription without internet service, and customer engaged for 5+ years** Factors like **gender, Availability of phone service and multiple lines** have no impact on churn

Final Thoughts and Recommendations

In conclusion, our analysis of the churn data has revealed several actionable insights that can be leveraged to reduce customer churn:

1.Senior Citizens and Customers Without Partners: These groups are at higher risk of churning, particularly females. Consider providing **targeted retention offers** or **personalized incentives** to keep these customers engaged.

2.Monthly Contract Customers: Customers on month-to-month contracts are more likely to churn due to the flexibility of these agreements. Introducing **long-term loyalty programs** or offering incentives for switching to annual contracts could help improve retention.

3.Customers Paying Electronically: There is a higher churn rate among customers who pay electronically, especially females. To address this, offer **exclusive promotions** or **discounts** to incentivize electronic payment users to stay loyal.

4.High Monthly Charges: As monthly charges increase, so does the churn rate. It's important to **review the pricing structure** for premium services to ensure that high costs do not outweigh perceived value, potentially offering discounts or bundled services.