

Customer Churn EDA Report

1. Introduction

This report analyzes customer churn patterns using Exploratory Data Analysis (EDA). Churn is a crucial metric for businesses, as retaining customers is often more cost-effective than acquiring new ones. The dataset includes customer demographic details, service usage, contract types, and churn status.

2. Data Preparation & Cleaning

- **Handling Missing Values:** Missing values in `Total_Charges` were replaced with 0 and converted to numerical format.
- **Duplicate Removal:** Duplicate entries based on `customer_ID` were removed.
- **Feature Engineering:**
 - `Senior_Citizen` was converted into a categorical feature (Yes/No).
 - `Total_Charges` was cleaned and converted into a numeric type.

3. Data Exploration

Churn Distribution

- A pie chart visualizes the percentage of customers who have churned versus those who have not.

Feature Correlations

- A correlation heatmap shows relationships between numerical variables, such as `Monthly_Charges`, `Total_Charges`, and `tenure`.

4. Visualizations & Insights

Sales & Churn Patterns

- **Scatter Plot:** `Monthly_Charges` vs. `Total_Charges`, colored by `Churn`.
- **Box Plot:** `Tenure` distribution between churned and non-churned customers.

Payment & Contract Analysis

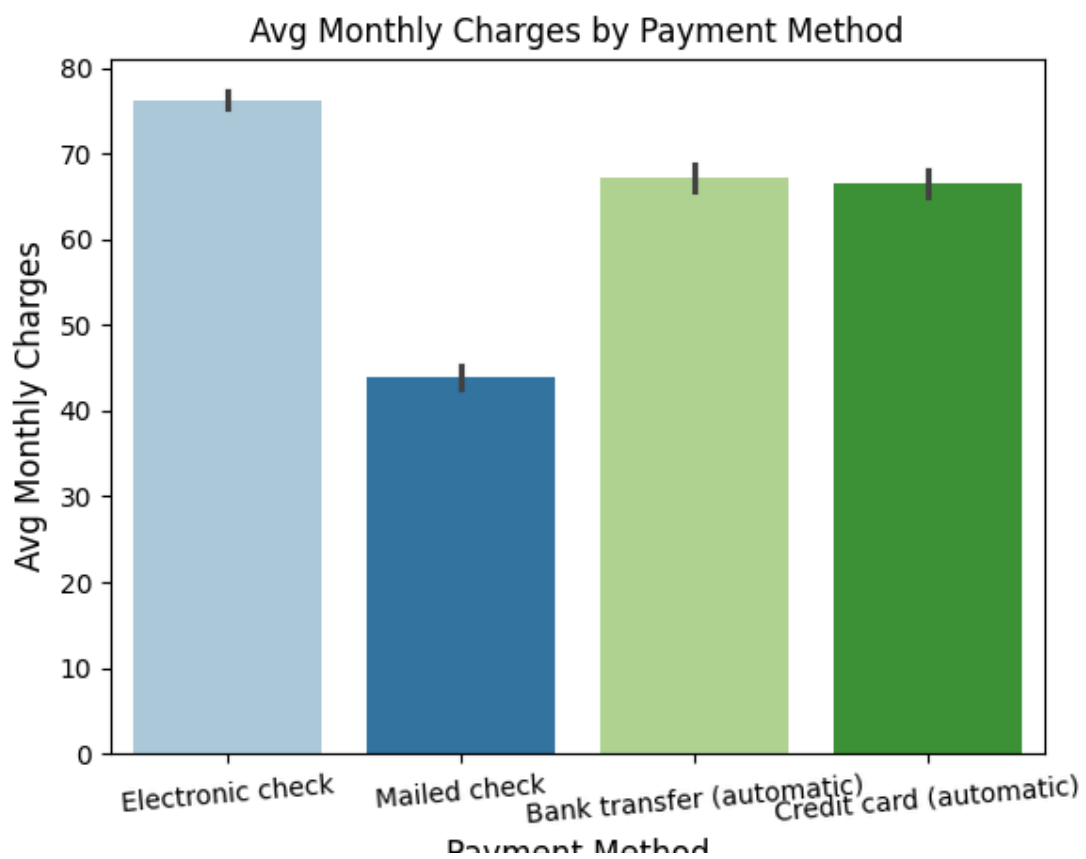
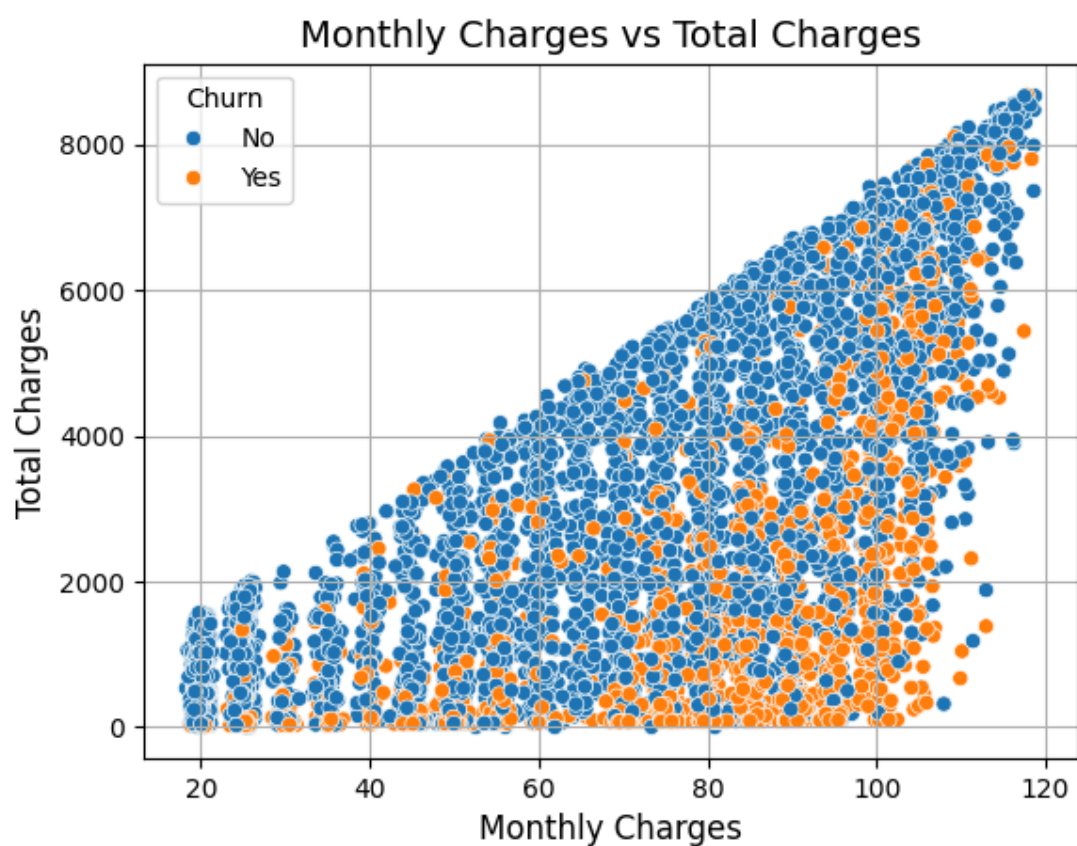
- **Bar Chart:** Average `Monthly_Charges` by `Payment_Method`.
- **Stacked Bar Chart:** `Internet_Service` vs. `Contract_Type`.
- **Line Chart:** Churn rate across different `Contract` types.

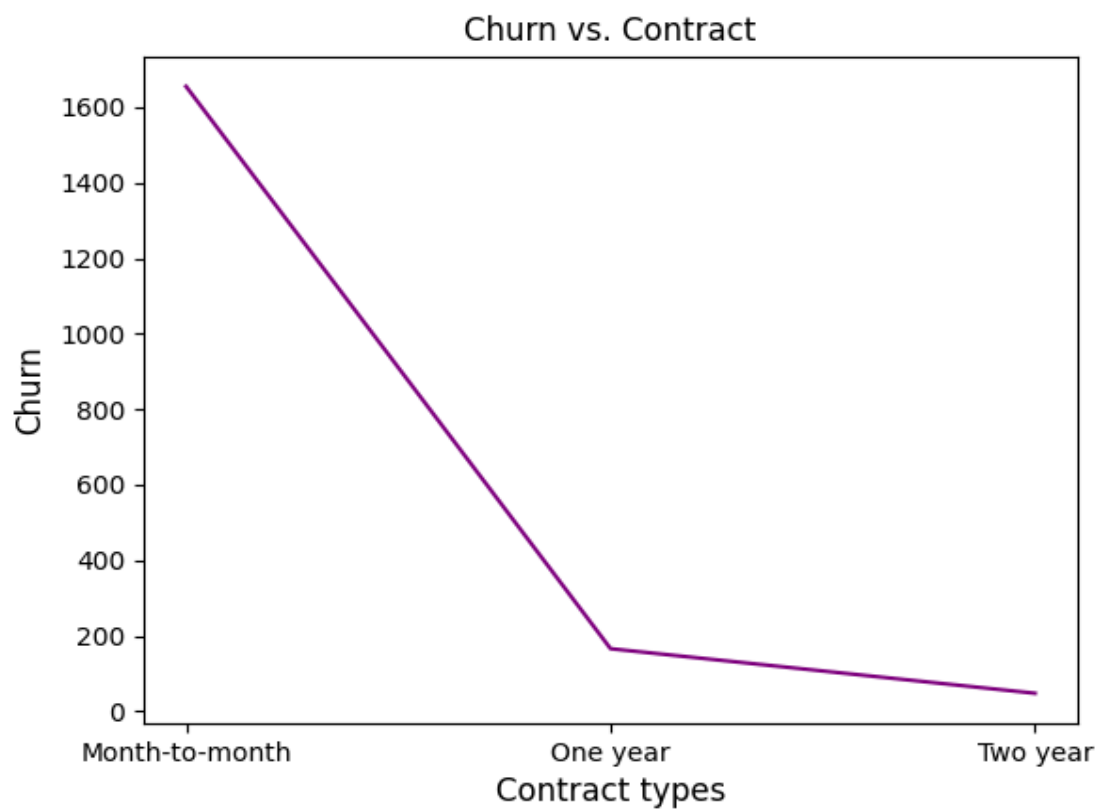
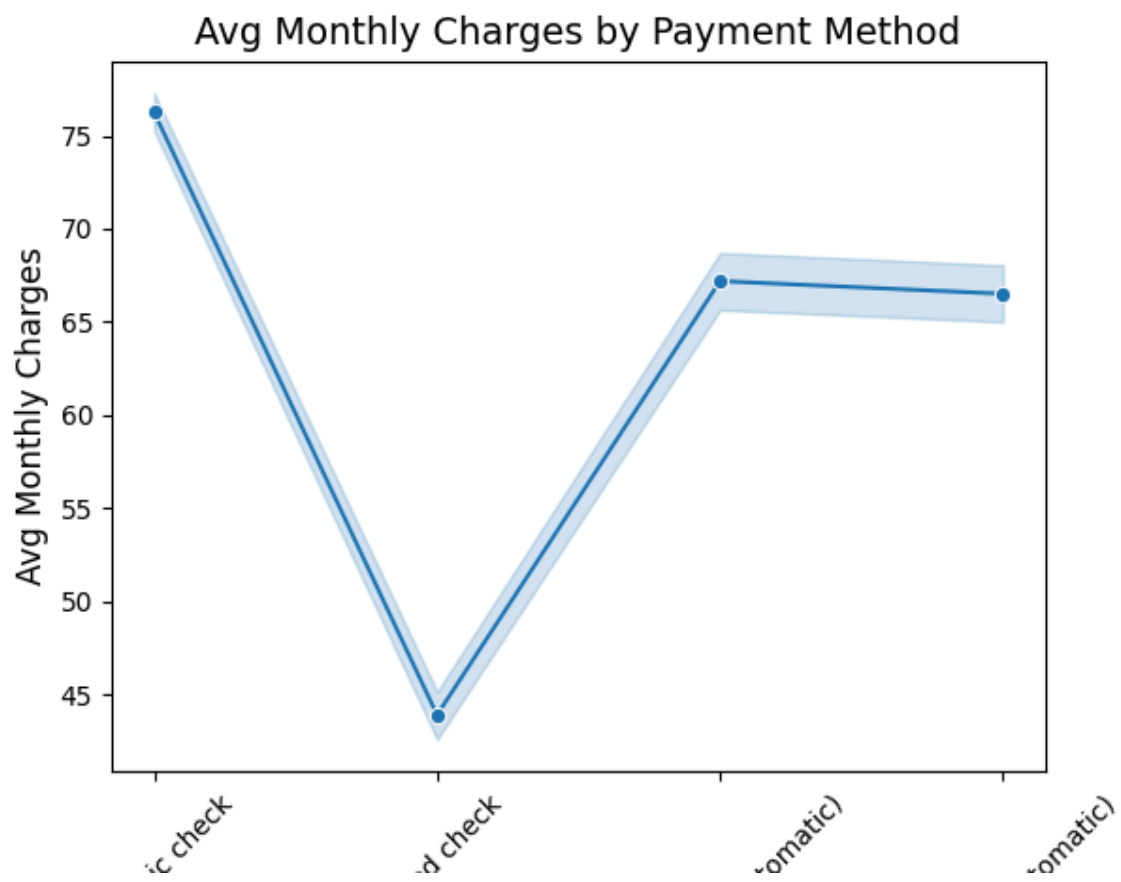
Behavioral Analysis

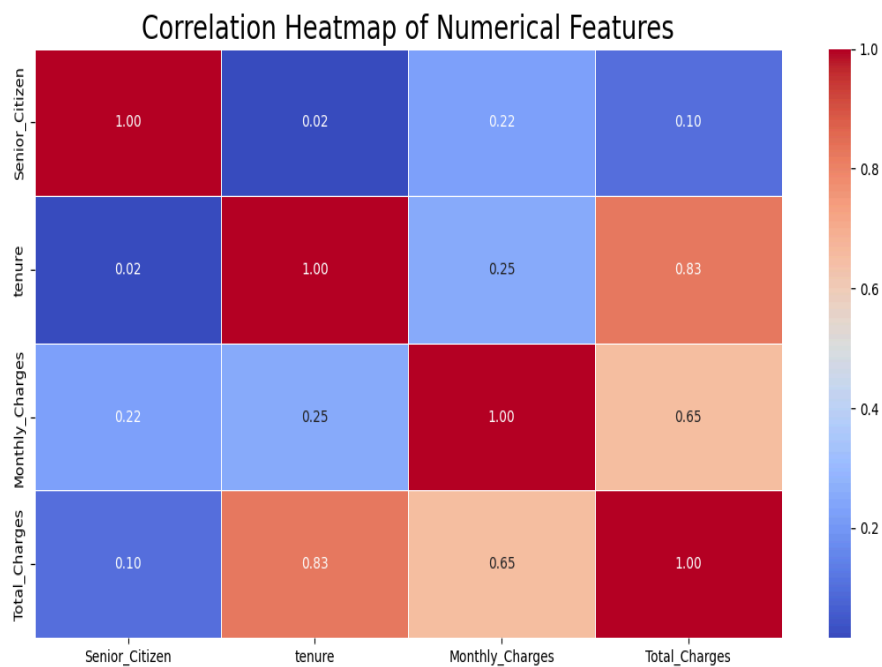
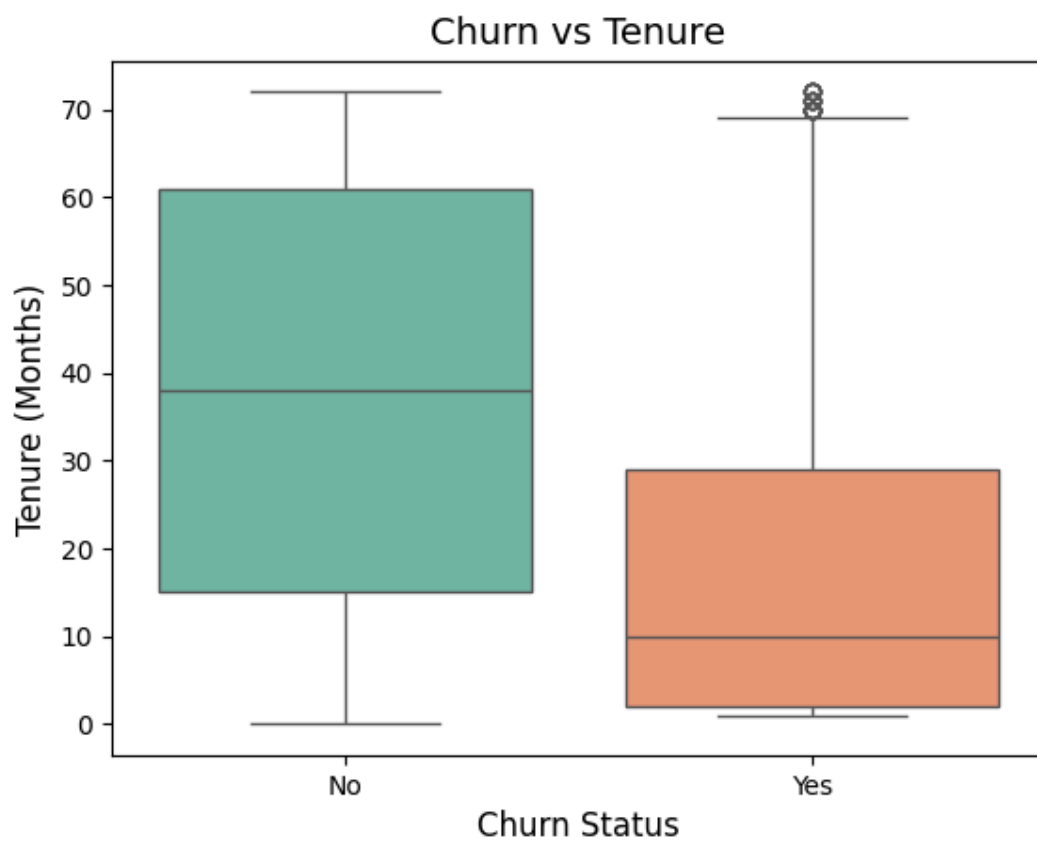
- **Histogram:** `Monthly_Charges` distribution for churned vs. non-churned customers.

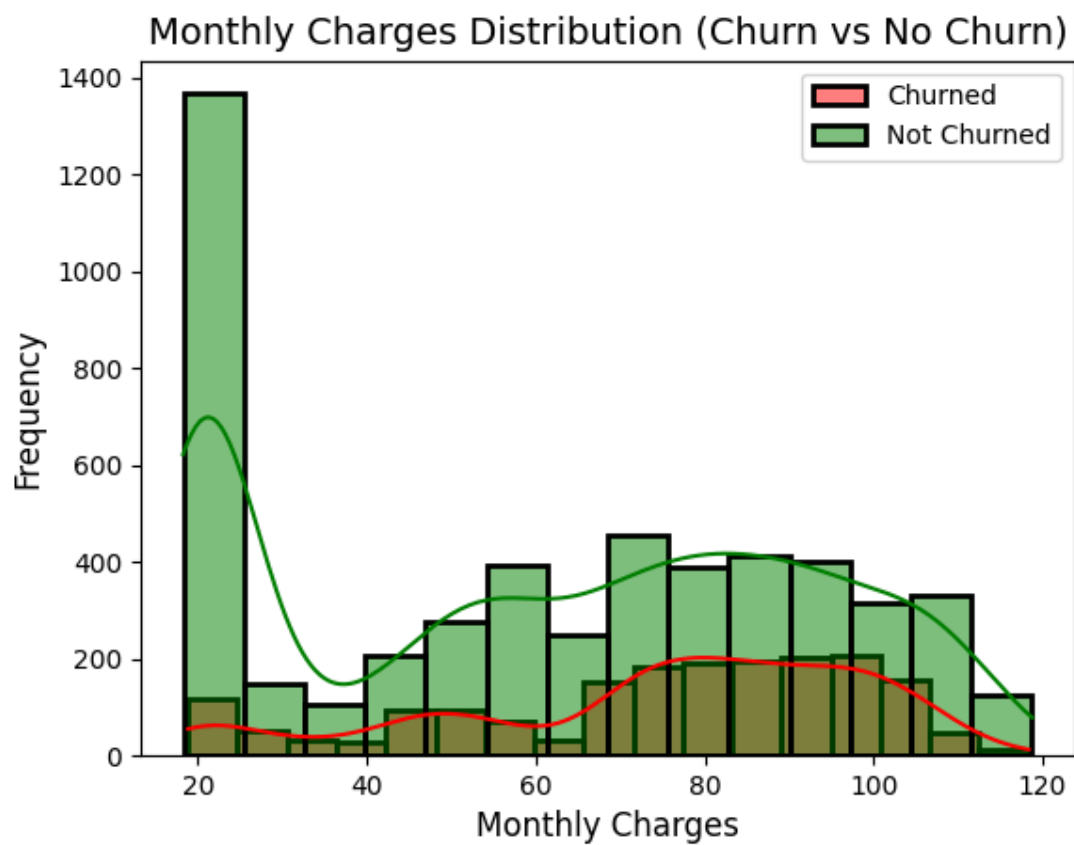
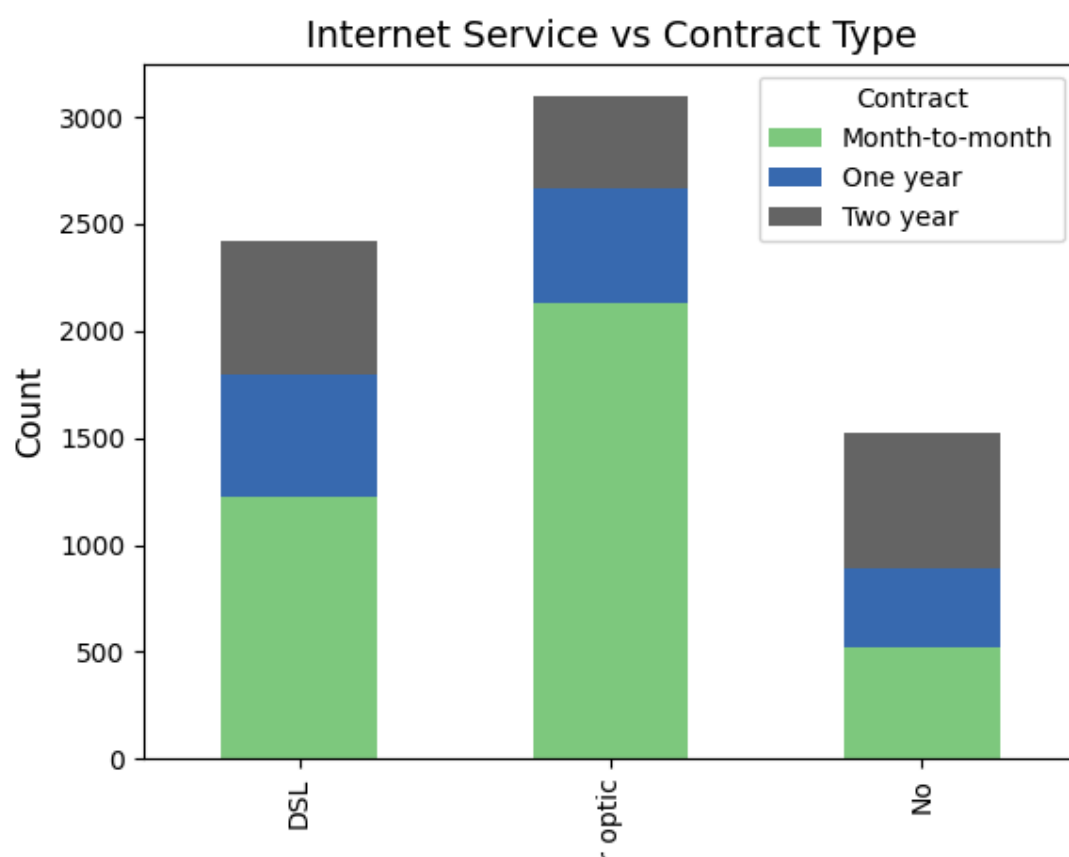
5. Key Findings & Business Recommendations

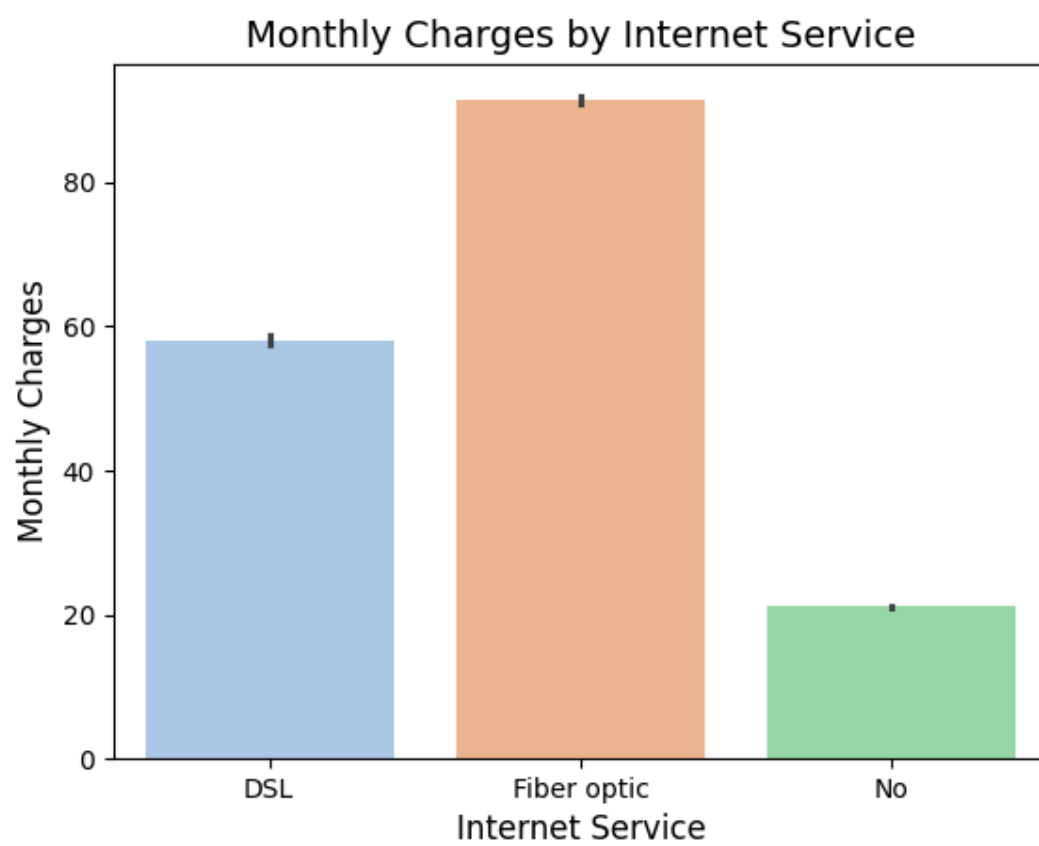
- **High Churn Segments:**
 - Customers with high `Monthly_Charges` show a higher likelihood of churning.
 - Short-term contracts (month-to-month) have a significantly higher churn rate.
 - **Service Type & Churn:**
 - Fiber optic internet users tend to churn more frequently than DSL users.
 - Customers with additional services such as streaming are more likely to stay.
 - **Billing & Payment Impact:**
 - Customers using electronic check payments exhibit a higher churn rate than those using credit cards or automatic bank transfers.
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Percentage of Churned Customers

