Summary Recommendations

1. **Data Preparation & Cleaning:**

   ○ Loaded the dataset and handled missing/empty values in the `TotalCharges` column.

   ○ Converted data types to ensure numerical columns were treated correctly for analysis.

2. **Exploratory Data Analysis (EDA):**

   ○ Used count plots to compare churn distribution across multiple categorical variables.

   ○ Checked for duplicates and null values to ensure data quality.

3. **Customer Behavior Insights:**

   ○ **Higher churn** observed in customers with:

     ■ Month-to-month contracts.

     ■ No online security, tech support, or backup services.

     ■ Fiber optic internet service.

   ○ **Lower churn** among customers with:

     ■ Two-year contracts.

     ■ Online security and tech support enabled.

4. **Visualization Strategy:**

   ○ Applied `seaborn` for count plots to visually distinguish churners vs non-churners.

   ○ Grouped features like services, contract type, and customer demographics for intuitive comparison.

Executive Summary:

🔍 Objectives

- Understand churn patterns across customer demographics and service usage.

- Identify at-risk customer segments.

- Recommend strategies to reduce churn and enhance customer satisfaction.

📊 Key Findings

- The overall churn rate is **26.5%**.

- Customers on **month-to-month contracts** show the highest churn (~44%).

- Churn is significantly higher among customers:

  - Without **online security** (~40%)

  - Using **fiber optic internet** (~42%)

  - Paying via **electronic check** (~45%)

  - With **paperless billing** (~34%)

- Customers **without partners or dependents** are more likely to churn.

✅ Recommendations

- Promote **long-term contracts** through discounts and loyalty programs.

- Bundle services like **online security and backup** to enhance value.

- Improve experience and engagement for **fiber optic** and **solo** users.

- Incentivize **credit card or auto-debit payments** over electronic checks.

- Implement a **predictive churn model** to proactively retain high-risk users.

📈 Impact

By targeting key churn drivers and aligning retention strategies with data-driven insights, the company can:

- Reduce churn rate significantly.

- Improve customer lifetime value.

- Strengthen brand loyalty and operational efficiency.