Summary and Recommendation

This report analyzes customer churn behavior at a telecom company, exploring patterns, service usage, and demographic impacts using data visualization and preprocessing techniques.

🧹 Data Cleaning & Transformation

- **Missing values** in `TotalCharges` were imputed with 0 to ensure a complete dataset.

- The `SeniorCitizen` binary column was converted to `Yes`/`No` for better readability in charts and analysis.

🔍 Churn Rate Overview

- Overall **churn rate** stands at **26.54%**, indicating over a quarter of the customer base has left the service.

- This rate was illustrated with a pie chart, providing a clear visual comparison of retained vs. lost customers.

👵 Demographics and Churn

- **Senior citizens** have a **significantly higher churn rate** compared to non-seniors.

  - While exact figures weren't displayed, visual insights suggest this demographic is **overrepresented among churned customers**, highlighting the need for focused retention efforts.

📡 Services & Their Impact on Churn

Analysis of service subscriptions revealed the following trends:

- Customers **less likely to churn** frequently had:

  - **Phone Service**

- ○ **DSL Internet** (vs. Fiber optic, which showed higher churn)

- ○ **Online Security**

- ○ **Online Backup**

- ○ **Tech Support**

- ○ **Streaming TV**

- The **absence of these services** correlates with **higher churn rates**. For example:

  - ○ Customers without **Tech Support** or **Online Security** are significantly more likely to leave, suggesting these features contribute to perceived service value.

📌 Key Strategic Insights

1. **Digital engagement is retention gold**: Services like Online Backup and Security not only add value but may act as anchors for loyalty.

2. **Senior citizens** churn more—consider tailored plans or personalized support for this segment.

3. **Bundled service offerings** could enhance perceived value and reduce churn, especially for at-risk customers.