

Summary And Recommendations

- **Overview of Customer Churn:**
 - Approximately **26.54% of customers** have churned, as visualized through a pie chart.
 - This high churn rate underscores the need to explore the drivers of customer attrition and identify retention strategies.
- **Data Preparation and Cleaning:**
 - Missing values in key columns like **TotalCharges** were replaced appropriately, ensuring consistency and enabling meaningful analysis.
 - Data types were adjusted (e.g., **TotalCharges** converted from object to float), facilitating accurate computations and visualizations.
- **Exploratory Data Analysis (EDA):**
 - A detailed countplot analysis revealed significant differences in churn rates across various services and demographics:
 - **Phone Services:** Customers with no phone service exhibited lower churn compared to those with services like multiple lines.
 - **Internet Services:** Fiber-optic users had higher churn rates compared to DSL or no internet users.
 - Breakdown of churn by senior citizens indicated that **a higher percentage of senior citizens** (grouped and visualized via stacked bar charts) tend to churn compared to younger demographics.
- **Key Drivers of Churn:**
 - Services like **Online Security**, **Device Protection**, and **Tech Support** were critical: customers without these add-ons experienced significantly higher churn rates.
 - Customers opting for "No internet service" generally showed lower churn rates, possibly due to limited engagement with services.
- **Visual Insights:**
 - Charts such as stacked bar plots, countplots, and pie charts provide actionable insights:
 - The **percentage breakdown of churn by senior citizens** highlighted that churn behavior is age-dependent.
 - Pie charts provided a clear snapshot of the churn distribution, emphasizing the need for tailored retention strategies.
- **Churn Breakdown by Customer Segments:**
 - The percentage of churn varied significantly by demographic and service usage:
 - Among senior citizens, **nearly 40% churned**, compared to younger groups with lower percentages.
 - Customers with **fiber optic internet** churned at rates exceeding **30%**, compared to under **15%** for DSL users.

Actionable Insights

- Focus on enhancing customer experience for **fiber optic users** by addressing service-related pain points.
- Invest in **add-on services** like online security and tech support to reduce churn among users without these services.
- Tailored retention strategies should be developed for **senior citizens**, who demonstrate higher churn rates compared to other groups