Executive Summary: Customer Churn Analysis

This analysis focuses on identifying key patterns and trends related to customer churn. Various data preprocessing steps were performed, followed by insightful visualizations to explore customer behaviors.

1. Data Preparation & Cleaning

- The dataset was inspected for missing values and duplicates. The `TotalCharges` column had blank values that were replaced with `0` and converted to float for proper numerical analysis.
- The `SeniorCitizen` column was converted from `0` and `1` to `Yes` and `No` for better readability.

2. Customer Churn Distribution

- A count plot of churned vs. non-churned customers was created.
- Approximately **27% of customers churned**, while **73% remained** with the company.

3. Payment & Subscription Analysis

- Count plots showed the distribution of various payment methods, contract types, and services used by customers.
- A pie chart of payment methods revealed that customers on **month-to-month contracts** had the highest churn rate.

4. Service Subscription & Churn Trends

- Customers with **fiber optic internet** had a **higher churn rate** compared to those using DSL.
- Additional services like **Online Security and Tech Support** appeared to **reduce churn**, as a higher percentage of retained customers had these services.

5. Monthly & Total Charges Impact on Churn

- **Higher monthly charges were correlated with increased churn**.
- A binned analysis of `TotalCharges` showed that customers with lower total charges (indicating shorter tenure) were more likely to churn.

Conclusion

- Customers with **month-to-month contracts, fiber optic internet, and higher monthly charges** were more likely to churn.
- Encouraging **long-term contracts** and providing **bundled services like Tech Support and Online Security** could help in customer retention.