

Summary

Executive Summary: Customer Churn Analysis

This analysis explores customer churn patterns to uncover factors influencing customer retention. By analyzing demographic and service-related features, we aim to identify trends that can help improve customer satisfaction and reduce churn rates.

Data Preparation & Cleaning

- The dataset was successfully loaded and cleaned:
 - Replaced **blank entries in TotalCharges** with 0 and converted the column to a numerical type (float) for analysis.
 - Transformed binary SeniorCitizen values (0/1) into human-readable labels (No/Yes).
 - Confirmed that:
 - **No missing values** remained after preprocessing.
 - **No duplicate customer IDs** were found.
 - Performed descriptive analysis to understand the distribution of numerical values like **tenure**, **monthly charges**, and **total charges**.
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Churn Overview


- **Churn Rate:**
 - Out of the total customers, **26.5% (≈1869 customers)** have churned, while **73.5% (≈5174 customers)** have remained.
 - This was depicted through:
 - A **bar plot** showing the imbalance in churn distribution.
 - A **pie chart** illustrating the percentage of churned vs retained customers.

 **Insight:** The business is losing over **1 in 4 customers**, indicating the need for churn-reduction strategies.

Demographic Analysis

1. Gender vs Churn

- **Male:** 26.0% churned
- **Female:** 27.1% churned

 **Insight:** Gender has minimal effect on churn behavior.

2. Senior Citizens


- **Churn Rate among Senior Citizens: 41.7%**
- **Churn Rate among Non-Senior Citizens: 24.0%**

! [Stacked bar chart used to visualize this]

 **Insight:** Senior citizens are **1.7x more likely** to churn compared to others.

Tenure Analysis

- Customers with a **tenure of 0–12 months** showed the highest churn rates.
- **Churn Rate by Tenure Group:**
 - **0–12 months:** ~45–60%
 - **13–24 months:** ~30%
 - **>24 months:** ~10–15%

 **Insight:** The longer a customer stays, the less likely they are to churn—highlighting the value of customer retention strategies early in the customer journey.

Contract Type & Churn

Contract Type Churn Rate

Month-to-Month **43.9%**

One Year **11.5%**

Two Year **2.8%**

- Visualized using a count plot segmented by contract types.

🔴 **Insight:** Customers on **month-to-month contracts** are **~15x more likely to churn** than those on **two-year contracts**. Suggests a strong case for promoting longer-term contracts to improve retention.

Services Influence on Churn

Further columns like InternetService, OnlineSecurity, TechSupport, and StreamingTV were analyzed (as seen from the code but cut off in preview).

Typical trends in such datasets include:

- **Online Security** and **Tech Support** being **strong retention features**.
- Lack of value-added services often correlates with higher churn.

Let me know if you'd like me to extract exact churn percentages from these columns too—I'll load the rest of the notebook for you.

Key Takeaways

- High churn among **new customers**, **month-to-month subscribers**, and **senior citizens**.
- Customers who use services longer, sign long-term contracts, and possibly have more service features are more likely to stay.
- There's an opportunity to:
 - **Incentivize long-term contracts**
 - **Engage new users better in the first year**
 - **Create targeted campaigns for senior citizens**