

# Summary and recommendation

This analysis investigates customer churn using the "Customer Churn" dataset. The EDA process involved data cleaning, visualization, and identifying key trends and patterns. Below are the detailed findings:

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## 1. Data Overview:

- **Dataset Composition:**
    - Total Records: 7,043 customers.
    - Features: 21 columns covering demographics, service usage, financial details, and churn status.
    - No missing values after data cleaning.
  - **Key Demographics:**
    - **Gender:** Nearly equal distribution (50.3% Male, 49.7% Female).
    - **Senior Citizens:** 16% of customers are senior citizens, indicating a diverse age range.
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## 2. Data Cleaning:

- Blank entries in the **TotalCharges** column (0.15% of data) were replaced with zero, and the column was converted to a numeric format.
  - Duplicate records or null values were not detected, ensuring data reliability.
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## 3. Descriptive Statistics:

- **Tenure:**
    - Average tenure is 32 months, with 10% of customers having a tenure below 5 months.
  - **Monthly Charges:**
    - Average: \$64.76, with 20% of customers paying over \$85 monthly.
  - **Total Charges:**
    - Ranges significantly from \$18.85 to \$8,596.67.
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## 4. Visualization Insights:

**Churn Analysis (Overall Churn Rate: 26%):**

- **Contract Type:**

- 42% churn in month-to-month contracts compared to only 3% in long-term contracts.
- **Paperless Billing:**
  - 59% of churned customers use paperless billing.

#### **Service Usage:**

- **Internet Services:**
  - Customers using fiber optic have a higher churn rate (41%) compared to DSL users (13%).
- **Streaming Services:**
  - Customers with streaming services churn at a rate of 34%, higher than those without (18%).

#### **Financial Insights:**

- Customers with monthly charges above \$80 churn at a rate of 45%, significantly higher than the 20% churn rate for customers paying less than \$50.
- Total charges show no clear trend with churn but indicate higher amounts for long-term customers.

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### **5. Key Takeaways:**

- **Demographics:** Senior citizens and customers on month-to-month contracts are more likely to churn.
- **Services:** Fiber optic internet and streaming services are associated with higher churn.
- **Billing & Contracts:** Month-to-month contracts and paperless billing lead to increased churn likelihood.
- **Retention Strategies:** Offering discounts or incentives for long-term contracts and addressing concerns with high-billing customers could reduce churn.

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This detailed breakdown includes numerical insights and percentages, providing actionable insights to guide decision-making. Let me know if you'd like further refinements or visual enhancements.