Customer Churn Analysis & Exploratory Data Analysis (EDA)

1. Introduction

This report combines insights from exploratory data analysis (EDA) and statistical evaluations to understand customer churn trends. The dataset contains 7,043 customer records, and the objective is to identify key factors influencing churn and suggest actionable strategies for retention.

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2. Data Exploration & Preparation

2.1 Libraries Used

To conduct the analysis, the following Python libraries were used:

- Pandas, NumPy (data manipulation)
- Matplotlib, Seaborn (visualization)
- SciPy, Scikit-learn (statistical analysis)

2.2 Data Cleaning & Preprocessing

- Missing values in TotalCharges were replaced with 0.
- Data types were converted appropriately.
- SeniorCitizen values (0 and 1) were converted to "No" and "Yes."
- Duplicates were checked and removed.

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3. Key Insights & Visualizations

3.1 Demographics & Customer Profile

- Gender: 51% Female, 49% Male (No significant churn difference).
- Senior Citizens: 16% of customers are senior citizens, who show a higher churn rate.
- Dependents: 70% of customers have no dependents; they are more likely to churn.

3.2 Service Type & Impact on Churn

- **Contract Type:**
  - Month-to-month contracts have 42% churn.
  - One-year contracts: 11% churn.
  - Two-year contracts: 3% churn.
- **Internet Service:**
  - Fiber optic users have 42% churn.

      o   DSL users have 18% churn.

- **Security & Support:**

    o   Customers without Online Security: 60% churn.

    o   Customers without Tech Support: 55% churn.

3.3 Financial Impact

- **Tenure:**

    o   Customers with less than 12 months have a 60% churn rate.

    o   Customers with over 60 months have only an 8% churn rate.

- **Monthly Charges:**

    o   Customers paying over $70/month have a 45% churn rate.

    o   Customers paying less than $30/month have a 10% churn rate.

- **Bundled Services:**

    o   Single-service customers have a 45% churn rate.

    o   Multi-service customers have a 20% churn rate.

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4. Recommendations & Strategies

4.1 Customer Retention Strategies

- Encourage long-term contracts by offering incentives (Month-to-month contracts contribute to 40%+ churn).

- Improve customer service and technical support (Lack of tech support increases churn by 55%).

4.2 Service Customization

- Target high-risk segments with personalized retention strategies.

- Introduce flexible plans and discounts for month-to-month users**.**

4.3 Pricing Optimization

- Offer loyalty discounts to customers paying over $70/month.

- Promote bundled services, reducing churn by 25% compared to single-service customers.

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5. Conclusion

This analysis highlights key drivers of customer churn and proposes effective retention strategies. By focusing on contract incentives, improved customer support, and flexible pricing, businesses can significantly reduce churn and enhance customer loyalty.