

Executive Summary

This project focuses on **Exploratory Data Analysis (EDA) for Telco Customer Churn**, leveraging **NumPy, Pandas, Matplotlib, and Seaborn** to clean, visualize, and extract insights from customer churn data sourced from **Kaggle**. The primary goal is to understand **customer churn trends** and the factors influencing retention.

Key Analysis and Insights (with Percentages)

① Data Cleaning & Preprocessing:

- Blank values were replaced with **0**, and necessary columns were **converted from object to float**.
- The **SeniorCitizen** column was **converted from (0,1) to ("Yes", "No")** for better readability.

② Customer Churn Rate Analysis:

- **26.54% of customers have churned**, highlighting a significant retention challenge.
- **Churn is highest among customers on month-to-month contracts**, suggesting that longer commitments reduce churn risk.

③ Impact of Services on Churn:

- **Tech Support Absence:** Customers **without Tech Support** had a significantly **higher churn rate** than those who had support.
- **Internet Service Type:**
 - **Fiber Optic users churned at a rate of ~40%**, significantly higher than **DSL users (~25%)**.
 - This indicates potential **dissatisfaction with Fiber Optic service** or pricing concerns.
- **Paperless Billing & Online Security:** Customers with **Paperless Billing** and **no Online Security** had **higher churn rates** than those using traditional billing and security services.

④ Contract Type & Churn Risk:

- **Month-to-month contracts** had the **highest churn rate (~43%)**, indicating that short-term customers are more likely to leave.

- **One-year contracts** had a **lower churn rate (~11%)**, while **two-year contracts** had the **lowest churn rate (~3%)**.
 - This confirms that **longer-term commitments reduce customer attrition**.
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Business Implications

- ✓ **Retaining short-term customers:** Offering **discounts or incentives for long-term contracts** could reduce churn.
 - ✓ **Service Improvement:** High churn rates among **Fiber Optic users** suggest a need to **improve service quality or pricing models**.
 - ✓ **Upselling add-ons:** Customers **without Tech Support or Security Services** churn more—targeted cross-selling can improve retention.
 - ✓ **Paperless Billing Engagement:** Churn is higher among **paperless billing users**, indicating a need for **better digital engagement strategies**.
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Conclusion & Next Steps

This analysis provides actionable insights to **reduce churn and enhance customer retention strategies**. The next steps include:

- ✓ **Building predictive churn models** using machine learning.
- ✓ **Developing targeted marketing campaigns** for at-risk customer segments.
- ✓ **Exploring additional customer behavior data** for deeper insights.

 **Check out the full analysis and visualizations on GitHub!**