# 📊 Telco Customer Churn Analysis – Executive Summary

This project presents an end-to-end **Exploratory Data Analysis (EDA)** on a telecom company's customer data to understand the key drivers behind **customer churn**. Through data wrangling, insightful visualizations, and churn breakdowns, the analysis reveals which factors contribute most to customer retention or loss.

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### 🔍 1. Churn Overview

- Out of all customers, **26.54% have churned**, while **73.46% have remained**.
- This high churn rate highlights a need for **improved customer retention strategies**.

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### 👫 2. Demographic Insights

#### 📌 Gender

- Churn rate is almost equal between **male and female** customers.
- ➤ **Conclusion:** Gender does **not influence churn** significantly.

#### 📌 Senior Citizens

- **42% of senior citizens churned**, compared to **24% of non-senior citizens**.
- ➤ **Conclusion:** Seniors are **1.75× more likely** to leave, signaling a need for better support or engagement strategies for older customers.

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### 💼 3. Service Usage and Churn Patterns

This section identifies how various services affect churn:

| Service | Churn With Service (%) | Churn Without Service (%) | 📌 Insight |
|---|---|---|---|
| **Phone Service** | ~19% | ~26% | Having phone service slightly reduces churn |
| **Internet Service** | DSL: 19.5%<br>Fiber Optic: 42.5% | No Internet: Much lower | Fiber Optic users churn significantly more |
| **Online Security** | 15.3% | 29.5% | Lack of security doubles churn |
| **Tech Support** | 17.2% | 30.5% | Strong impact on retention |
| **Streaming Services** | Slight increase in churn | Lower churn without streaming | Entertainment isn't a major retention factor |

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### 📈 4. Visualizations & EDA Techniques

- Used **Seaborn** & **Matplotlib** for:
    - Count plots
    - Stacked bar charts
    - Pie charts
- Visuals compare churn across services, age groups, and service combinations.
- Grouped plots make trends and patterns easy to interpret.

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### 🧹 5. Data Cleaning & Preparation

- Cleaned TotalCharges by replacing empty strings and converting to float.
- Transformed SeniorCitizen to readable labels ("Yes"/"No").
- Verified no major missing values or duplicates.
- Categorical variables were preserved for grouped analysis.

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### ✅ Key Business Insights

1. **Senior citizens** are at high risk of churn; personalized offers and senior-friendly support are recommended.
2. Lack of **technical support** and **online security** is directly linked to higher churn — bundling these services may increase retention.
3. **Fiber Optic users** churn the most; this may point to pricing or service quality issues.
4. Streaming services do **not reduce churn**, indicating limited loyalty benefits from add-on entertainment features.

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### 📦 Tools & Libraries Used

- Python
- Pandas
- Matplotlib
- Seaborn
- Jupyter Notebook