Telco Customer Churn Analysis

# 1. Introduction

This project analyzes the Telco Customer Churn dataset, aiming to identify key factors influencing customer churn. Churn is when customers stop using a company’s services, and understanding its drivers is crucial for customer retention strategies.

# 2. Data Preprocessing

- Dataset Loading: The dataset 'churn.csv' was loaded using pandas.  
- Cleaning:  
 • Blank values in TotalCharges were replaced with 0 and converted to float.  
 • Verified no duplicate customerID entries.  
- Feature Engineering:  
 • Converted SeniorCitizen column (0/1) to categorical Yes/No for readability.

# 3. Exploratory Data Analysis (EDA)

## 3.1 Customer Churn Overview

- Countplot and Pie chart showed that 26.54% of customers have churned while 73.46% stayed.  
- This indicates that more than a quarter of the customer base is at risk.

## 3.2 Churn by Demographics

- Gender: Churn distribution is nearly balanced between male and female customers, showing gender is not a major factor in churn.  
- Senior Citizens: A smaller portion of customers are senior citizens, but they show a higher churn percentage compared to non-seniors.

## 3.3 Churn by Services

- Customers with Fiber Optic internet churned more compared to DSL or no internet.  
- Customers who lacked OnlineSecurity, OnlineBackup, DeviceProtection, or TechSupport were more likely to churn.  
- Streaming services (TV/Movies) did not have as strong an impact individually, but still showed slightly higher churn rates when not subscribed.

## 3.4 Other Key Observations

- Customers with Phone Service = Yes formed the majority, but churn was evident in both groups.  
- Multiple Lines service did not significantly reduce churn.  
- Overall, the absence of bundled services correlates with higher churn.

# 4. Insights & Conclusion

1. Overall churn rate is ~26.5%, a significant risk to the company’s customer base.  
2. Senior citizens churn more than younger customers.  
3. Internet service type matters: Fiber optic customers churn at higher rates.  
4. Value-added services (OnlineSecurity, Backup, TechSupport, Device Protection) play a critical role in reducing churn — customers without these services are far more likely to leave.

# 5. Business Recommendations

- Focus retention efforts on Fiber Optic customers by improving service quality.  
- Provide special offers or discounts for Senior Citizens to retain them.  
- Encourage customers to adopt bundled services (security, backup, support) via promotions, since they are associated with lower churn.  
- Develop a predictive churn model to proactively identify high-risk customers.