# Executive Summary — Telco Customer Churn Analysis

## Objective

This analysis investigates the key drivers of customer churn for a telecom company. The goal is to uncover patterns and correlations among demographics, subscription plans, service usage, and contract types to help the business reduce churn and improve retention.

## Dataset Overview

• Total records: 7,043 customers  
• Columns: 21 attributes (demographics, account information, and service details)  
• Target variable: Churn (Yes/No — whether the customer left the service)  
  
Data Cleaning & Preparation:  
- Converted TotalCharges from object → float and replaced missing values with 0.  
- Verified no duplicate customerID entries.  
- Encoded SeniorCitizen as binary (0 = No, 1 = Yes).  
- Performed EDA using seaborn and matplotlib visualizations.

## Overall Churn Distribution

• Churned Customers: 1,869 (26.54%)  
• Retained Customers: 5,174 (73.46%)  
  
Insight: Roughly 1 in 4 customers discontinue their services — signaling a notable churn rate that needs strategic attention.

## Key Insights from Data Visualizations

A. Demographics  
- Gender: Churn rates are nearly equal — gender is not a strong predictor.  
- Senior Citizens: Represent 16% of customers but churn at ~42%, double the overall rate.  
- Dependents & Partners: Customers without dependents/partners churn at 31%, vs 20% for those with families.  
  
B. Contract Type & Tenure  
- Month-to-month contracts have highest churn (~43%), two-year contracts lowest (~3%).  
- Customers with tenure <12 months churn ~45%, while long-term customers churn <10%.  
  
C. Services & Usage  
- Fiber optic users churn 41%, DSL users 19%.  
- Lack of Online Security or Tech Support strongly linked to churn (~40%+).  
  
D. Billing & Payment Methods  
- Paperless Billing users churn 33% vs 17% for mailed billing.  
- Electronic Check users churn ~45%; auto-pay users only 15–20%.  
  
E. Charges & Revenue Impact  
- Churned customers pay ~$75/month vs $60 for retained.  
- Higher monthly charges correlate with churn.

## Correlation & Key Drivers

1. Contract Type (Month-to-month) — Strong Positive Correlation  
2. Tenure — Strong Negative Correlation  
3. Internet Service (Fiber optic) — Moderate Positive  
4. Online Security / Tech Support — Moderate Negative  
5. Payment Method (Electronic Check) — Moderate Positive

## Business Recommendations

Contracts: Offer discounts or loyalty points for 1–2 year contracts.  
Senior Citizens: Introduce senior-friendly plans and customer care.  
Service Bundles: Include Online Security & Tech Support in packages.  
Payment Methods: Promote auto-pay options.  
Pricing Strategy: Revisit fiber optic pricing for retention.

## Summary Table

Total Customers: 7,043  
Churned Customers: 1,869 (26.54%)  
Average Monthly Charges (Churned): $75  
Average Monthly Charges (Retained): $60  
Average Tenure: ~32 months  
High-risk Segment: Month-to-month, high charge, electronic check payment

## Final Conclusion

The analysis clearly shows that contract type, tenure, payment method, and optional service features are the most critical factors influencing churn. By focusing on long-term engagement, targeted offers, and improved service value, the company can meaningfully reduce churn by an estimated 10–15% within one year.