Customer Churn EDA Project Summary

# 1. About the Data

Dataset Name: Customer Churn  
Total Entries: 7,043 customers  
Features: 21  
 - Demographics: Gender, SeniorCitizen, Partner, Dependents  
 - Services: PhoneService, MultipleLines, InternetService, OnlineSecurity, OnlineBackup, DeviceProtection, TechSupport, StreamingTV, StreamingMovies  
 - Account Info: Contract, PaperlessBilling, PaymentMethod, MonthlyCharges, TotalCharges, Tenure  
 - Target Variable: Churn (Yes/No)

# 2. Goal of the Analysis

Identify factors contributing to customer churn  
Extract insights to help retain customers  
Prepare dataset for predictive modeling or business decision-making

# 3. Overall Insights from the Data

Churn Rate: 26.54% (1,869 out of 7,043 customers)  
Tenure:  
 - Average: 32.37 months  
 - Min-Max: 0 – 72 months  
Monthly Charges:  
 - Average: ₹64.76  
 - Max: ₹118.75  
Total Charges:  
 - Average: ₹2279.73  
 - Max: ₹8684.80

# 4. Key Findings & Insights (with Numbers)

## Churn Rate Overview

Churned Customers: 1,869 (26.54%)  
Stayed Customers: 5,174 (73.46%)

## Gender

Male – 930 churned, 2,550 stayed (Churn Rate: 26.7%)  
Female – 939 churned, 2,624 stayed (Churn Rate: 26.3%)  
Insight: No major difference in churn rates between genders.

## Senior Citizens

Senior Citizens: 476 churned out of 1,140 (Churn Rate: 41.75%)  
Non-Senior: 1,393 churned out of 5,903 (Churn Rate: 23.60%)  
Insight: Senior citizens churn nearly twice as much as others.

## Tenure Distribution

Customers with < 10 months tenure:  
 Churned: ~1,050  
 Stayed: ~400  
 Churn Rate: ~72.4%  
 Insight: Newer customers are at high churn risk.

## Contract Type

Month-to-month: 1,656 churned / 3,872 (Churn Rate: 42.77%)  
One year: 166 churned / 1,478 (Churn Rate: 11.23%)  
Two year: 47 churned / 1,693 (Churn Rate: 2.77%)  
Insight: Month-to-month customers are 15× more likely to churn than those on 2-year contracts.

## Internet Service Type

DSL: Churn Rate 19.45%  
Fiber optic: Churn Rate 41.02%  
No internet: Churn Rate 7.5%  
Insight: Fiber optic users have highest churn, likely due to higher pricing.

## Online Services (When Not Available)

Online Security: 46.95%  
Tech Support: 46.55%  
Device Protection: 44.50%  
Insight: Lack of support services is a major churn factor.

## Payment Method

Electronic Check: 45.0%  
Mailed Check: 15.8%  
Bank Transfer (auto): 16.7%  
Credit Card (auto): 15.3%  
Insight: Electronic Check users are 3× more likely to churn.

# 5. Output Data (Post Cleaning)

Cleaned all whitespaces from TotalCharges and converted to float  
Converted SeniorCitizen from numeric to categorical  
No missing values  
Final shape: (7043, 21)

# 6. Final Conclusions

Churn is highest among short-tenured, month-to-month contract, senior citizen customers.  
Lack of service add-ons increases churn.  
Payment method is a strong churn indicator.  
Customers with bundled or annual services churn far less.

# 7. Business Recommendations

Focus on customers with <10 months tenure – offer loyalty rewards or engagement campaigns  
Promote longer-term contracts via discounts or bundled offerings  
Offer personalized plans and check-ins for senior citizens  
Upsell services like TechSupport, OnlineSecurity, and DeviceProtection  
Encourage auto-pay options and reduce reliance on electronic checks  
Improve onboarding experience to retain new customers