**Telco Customer Churn Data Report**

Introduction

This report presents an analysis of the **Telco Customer Churn** dataset, which contains comprehensive information on customers of a telecommunications company, aiming to identify patterns and potential causes of customer churn. The dataset includes demographic information, account details, services subscribed, billing data, and the churn status for each customer.

Dataset Overview

**Number of records:** 7,043  
**Attributes:** 21 per customer

**Key columns:**

* customerID
* gender
* SeniorCitizen
* Partner
* Dependents
* tenure (months as customer)
* PhoneService
* MultipleLines
* InternetService (DSL, Fiber optic, None)
* OnlineSecurity, OnlineBackup, DeviceProtection, TechSupport
* StreamingTV, StreamingMovies
* Contract (Month-to-month, One year, Two year)
* PaperlessBilling
* PaymentMethod
* MonthlyCharges
* TotalCharges
* Churn (target variable: Yes/No)

Demographics

* **Gender:** Distribution is approximately balanced between male and female customers.
* **Senior Citizen Status:** Encoded as 1 (senior) and 0 (non-senior).
* **Partner & Dependents:** Binary indicators reflect family status.

Services

* **Phone Service:** Customers may or may not have a phone line.
* **Multiple Lines:** Indicates whether a customer has multiple lines, with the option of 'No phone service'.
* **Internet Service:** Categorical, majorly consisting of DSL or Fiber optic. Some customers have 'No' Internet service.
* **Supplementary Services:** OnlineSecurity, OnlineBackup, DeviceProtection, and TechSupport features show whether customers have these add-ons.
* **Streaming Services:** Includes streaming TV and/or movies.

Contract & Billing

* **Contract Types:** Customers are on month-to-month, one-year, or two-year contracts.
* **Paperless Billing:** Binary indicator if the customer opted for paperless billing.
* **Payment Methods:** Four options are provided: Electronic check, Mailed check, Bank transfer (automatic), Credit card (automatic).
* **Charges:**
  + **MonthlyCharges:** Ongoing service charges, varies significantly.
  + **TotalCharges:** Aggregate payment for services provided so far.

Churn Analysis

**Churn** is defined in the dataset as whether a customer has canceled ("Yes") or not ("No") at the time of data collection.  
A cursory examination indicates:

* Customers with **month-to-month contracts** show a higher tendency to churn compared to those with one-year or two-year contracts.
* Churn rates are higher for customers with **electronic check** as a payment method.
* Customers who use **fiber optic** Internet services have a higher churn rate compared to those using DSL.
* Customers without add-on services such as security, tech support, or device protection tend to churn more frequently.

Data Quality & Observations

* **Tenure:** Ranges from 1 to 72 months, indicating varying customer lifespans.
* **Missing Values:** Some records, especially in TotalCharges, may contain missing or blank data, typically for very new customers.
* **Categorical Features:** Many features are binary or categorical with limited possible values, suitable for direct encoding or dummy variables for modeling.

Summary of Key Patterns

* **High churn risk:** Month-to-month contracts, high monthly charges, no add-on services, use of electronic checks.
* **Lower churn risk:** Customers with long tenure, bundled services, longer contracts, and automatic payment methods (bank transfer or credit card).

Recommendations for Further Analysis

* **Statistical Churn Modeling:** Using logistic regression or tree-based models to determine the relative importance of each feature in predicting churn.
* **Customer Segmentation:** Cluster analysis to identify distinct customer personas for targeted retention strategies.
* **Service Utilization:** Explore cross-selling opportunities for high-churn customer segments missing add-on services.