Telecom Customer Churn Analysis

This Telecom Churn Analysis project explores customer behavior to identify why users leave a telecom service. Using Python, Pandas, Matplotlib, and Seaborn, the project includes complete data cleaning, EDA, visual insights, and pattern identification. Key churn drivers such as contract type, payment method, service usage, and monthly charges are analyzed. The project demonstrates strong analytical, data visualization, and business insight-generation skills essential for data-driven roles.

1. Project Objective

The goal of this project is to analyze customer data to understand what factors lead to churn in the telecom industry. Churn analysis is one of the most important business problems since customer retention directly impacts revenue.
This project demonstrates your ability to:
- Work with complex datasets
- Clean and preprocess raw data
- Perform in-depth exploratory analysis
- Visualize customer behavior
- Derive meaningful business insights

2. Dataset Overview

The dataset contains 7,043 customer records and includes information across four major areas:

A. Customer Demographics
- Gender
- Senior Citizen
- Partner / Dependent status

B. Account Information
- Contract type (Month-to-Month, One-Year, Two-Year)
- Paperless Billing
- Payment method (Electronics check, credit card, bank transfer, etc.)
- Tenure in months

C. Services Subscribed
- Phone service
- Multiple lines
- Internet service type (DSL, Fiber optic, None)

- Online security, backup, device protection
- Tech support
- Streaming TV and movies

D. Financial Metrics
- Monthly charges
- Total charges

E. Target Variable
- Churn (Yes/No)

This combination of attributes reflects a realistic business dataset and highlights your experience working with multi-dimensional data.

3. Project Workflow

This project follows a complete, industry-standard data analysis pipeline.

Step 1: Data Loading & Understanding
- Loaded dataset using pandas
- Reviewed structure, data types, and missing values
- Performed initial statistical summary

Step 2: Data Cleaning & Preprocessing
- Handled blank/invalid values in 'TotalCharges'
- Converted numerical fields to correct data types
- Standardized categorical values (e.g., SeniorCitizen → yes/no)
- Removed inconsistencies for clean and reliable analysis

Step 3: Exploratory Data Analysis (EDA)

Extensive EDA techniques were used:
- Countplots for all categorical variables
- Histograms/distributions for numerical features
- Churn vs Non-Churn comparison
- Identification of correlations and usage patterns

Step 4: Insight Extraction

Converted raw results into actionable insights relevant for decision-making and retention planning.

4. Major Business Insights Identified

These insights directly support telecom business strategies:

1. Customers with month-to-month contracts churn at the highest rate

This suggests the need to promote long-term contracts and improve loyalty programs.

2. Electronic check payment users show significantly higher churn
Indicates dissatisfaction or lack of trust with payment experience.

3. Customers not subscribed to security, backup, or tech support services churn more
These services act as retention tools.

4. Higher monthly charges are linked to higher churn
Price-sensitive customers may require special plans or personalized offers.

5. Customers with long tenure are most loyal
Reinforces the importance of early engagement strategies.

These insights demonstrate your ability to connect data findings with business outcomes.

5. Tools & Technologies Used

This project showcases your technical proficiency with:

Python – Core programming
Pandas & NumPy – Data cleaning, transformation, manipulation
Matplotlib & Seaborn – Visual analytics and storytelling
Jupyter Notebook – Reproducible workflow, documentation, and analysis

6. Why This Project Is Valuable for Recruiters

This project highlights:
- Your understanding of a real-world business scenario
- Your ability to work end-to-end through the data analysis pipeline
- Clear presentation and communication of insights
- Strong analytical and visualization skills
- Job-ready experience applicable to Data Analyst, Business Analyst, and ML roles

It reflects not just technical skill, but also 'business understanding and problem-solving ability', which are highly valued by employers.