Customer Churn Analysis

Abstract

This project aims to analyze customer churn behavior for a telecom company. Customer churn refers to the rate at which customers discontinue using a service. The objective is to identify key patterns and factors that contribute to customer attrition. By conducting data cleaning, exploratory data analysis, and correlation studies, the project uncovers meaningful insights that can help the company enhance customer retention.

Tools & Technologies Used

- **Python**: Core programming language
- **Pandas**: Data manipulation and preprocessing
- **NumPy**: Numerical computations
- **Matplotlib & Seaborn**: Data visualization
- **Jupyter Notebook**: Interactive development environment
- **SQL**: Data querying and retrieval

Methodology

1. **Data Cleaning and Preprocessing**
    - Handled missing values in the `TotalCharges` column by replacing them with 0.
    - Converted the binary `SeniorCitizen` column (0 or 1) into categorical values ("No" and "Yes") for better readability.
2. **Exploratory Data Analysis (EDA)**
    - A pie chart revealed that **26.54%** of customers had churned.
    - Higher churn rates were observed among **senior citizens**.
    - Customers with a **short tenure (1–2 months)** exhibited a significantly higher likelihood of leaving.
    - The **electronic check** payment method was strongly associated with increased churn.
3. **Service-Based Analysis**
    - Customers who continued using services such as **PhoneService**, **DSL Internet**, and **OnlineSecurity** were less likely to churn.
    - Those who lacked access to features like **TechSupport**, **OnlineBackup**, and **StreamingTV** showed a higher propensity to leave.

Conclusion

The analysis highlights several factors associated with customer churn:

- **Senior citizens**, **new customers**, and those with **fewer subscribed services** are more likely to discontinue.
- The **payment method** also plays a critical role, with electronic check users showing a higher churn rate.