Exploratory Data Analysis (EDA) Summary: Churn Customer Analysis

Project Overview This notebook performs an exploratory data analysis on a customer churn dataset containing 7,043 records with 21 features. The goal is to understand customer behavior and identify patterns that may lead to churn (customers leaving the service).

Key Steps in the Analysis

1. **Data Loading and Initial Inspection**
    - Imported necessary libraries (NumPy, Pandas, Seaborn, Matplotlib)
    - Loaded the dataset from "churn_customer.csv"
    - Examined the first and last 5 rows to understand the data structure
    - Checked dataset dimensions (7,043 rows × 21 columns)
    - Reviewed data types and null values
2. **Data Cleaning**
    - Identified blank values in "TotalCharges" column (replaced with 0 and converted to float)
    - Changed "SeniorCitizen" from numeric (0/1) to categorical ("NO"/"YES")
    - Verified no duplicate customer IDs
3. **Basic Statistics**
    - Numerical columns show:
        - Average tenure: 32.37 months
        - Average monthly charges: $64.76
        - Average total charges: $2,279.73
        - 16.2% are senior citizens
4. **Churn Analysis**

    - Visualized churn distribution:
        - 73.5% customers stayed
        - 26.5% customers churned
    - Created countplot and pie chart to show churn proportions
5. **Feature Engineering**
    - Converted data types for better analysis
    - Prepared categorical variables for visualization

Key Findings

- **Churn Rate:** Approximately 26.5% of customers churned, indicating significant customer attrition.
- **Data Quality:**
    - No missing values except for blanks in "TotalCharges" which were handled
    - No duplicate customer IDs
    - Data types were appropriately converted
- **Customer Characteristics:**
    - Average customer tenure is about 32 months
    - Monthly charges average $64.76
    - About 16% of customers are senior citizens
- **Visualizations Created:**
    - Countplot and pie chart showing churn distribution
    - Basic statistical summaries of numerical features

Next Steps Suggested by Analysis

1. **Further Feature Analysis:**
    - Explore relationships between churn and other features like contract type, payment method, internet service, etc.
    - Examine how tenure, monthly charges, and total charges relate to churn
2. **Additional Visualizations:**
    - Create more detailed visualizations to understand patterns in churn
    - Examine correlations between variables
3. **Predictive Modeling:**
    - The cleaned dataset is now ready for building predictive models to identify customers at risk of churning