Predicting Customer Churn for a Telecom Company: The goal is to predict whether a customer will churn (leave the company) based on various features related to their account and service usage. Predicting churn accurately allows the company to proactively retain customers by targeting them with special offers or addressing their issues.

Dataset:

We'll assume a hypothetical dataset with the following features:

CustomerID: Unique identifier for the customer

Gender: Customer's gender (Male/Female)

Age: Customer's age

Tenure: Number of months the customer has been with the company

ServiceTier: The level of service the customer subscribes to (Basic, Plus, Premium)

MonthlyCharges: The amount charged to the customer each month

TotalCharges: The total amount charged to the customer over the course of their tenure

NumTechnicalSupportCalls: Number of technical support calls made by the customer

HasInternetService: Whether the customer has internet service (Yes/No)

Churn: Whether the customer churned (Yes/No) - Target Variable

Steps for the Solution:

1. **Data Cleaning:**

Handle missing values, if any.

Convert TotalCharges from a string to a numeric data type.

Encode categorical variables using one-hot encoding or label encoding.

2. **Exploratory Data Analysis (EDA):**

Visualize the distribution of key features (e.g., Age, MonthlyCharges).

Examine the relationship between Churn and other features.

Use correlation analysis to identify potential predictors for churn.

3. **Preparing the Data for Modeling:**

Split the data into training and testing sets.

Normalize or standardize the features, if necessary.

4. **Logistic Regression Model:**

Train a logistic regression model using the training data.

Evaluate the model's performance on the test data using appropriate metrics (e.g., accuracy, precision, recall).

5. **Analysis and Inference:**

Analyze the model coefficients to understand the impact of various features on the likelihood of churn.

Perform statistical tests, if necessary, to assess the significance of findings.

6**. Business Insights and Recommendations:**

Provide insights on key drivers of customer churn.

Suggest targeted actions to reduce churn based on model findings.