1. Installed Required Libraries

You checked and confirmed that the following libraries were already installed:
✅ `numpy` – for numerical computations
✅ `pandas` – for data manipulation
✅ `matplotlib` & `seaborn` – for data visualization

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2. Loaded the Dataset

- Successfully read the **"Customer-churn.csv"** dataset using `pandas`.
- The dataset contains **7043 rows** and **21 columns**.

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3. Explored the Data

- Displayed the first **five rows** using `df.head()`.
- The dataset includes a mix of **categorical** and **numerical** features:

Column Type	Example Columns
Categorical (Yes/No, Plan Type, Payment Method, etc.)	`gender`, `Partner`, `Dependents`, `PhoneService`, `MultipleLines`, `InternetService`, `Contract`, `PaymentMethod`, `Churn`
Numerical (Continuous Values)	`tenure`, `MonthlyCharges`, `TotalCharges` (needs conversion)

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4. Checked Data Types & Missing Values

- Used `df.info()` and identified the following:
  - `TotalCharges` is **stored as an object (string)** instead of a numeric type.
  - No missing values were detected, but some values in `TotalCharges` appear as blanks.

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5. Data Cleaning

- **Handled missing values in `TotalCharges`:**

- Found blank values and replaced them with **0** (assuming missing values indicate no charges).
- Converted `TotalCharges` from **object → float**.

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6. Dataset Composition (Category Breakdown in Percentage)

- **Gender Distribution:**
  - Male: **50.5%**
  - Female: **49.5%**
- **Churn Distribution:**
  - Customers who **churned (left)**: **26.5%**
  - Customers who **stayed**: **73.5%**
- **Contract Types:**
  - Month-to-month: **55%**
  - One year: **19.4%**
  - Two years: **25.6%**
- **Internet Service Providers:**
  - Fiber Optic: **44.3%**
  - DSL: **34.2%**
  - No Internet: **21.5%**
- **Payment Method Preferences:**
  - Electronic Check: **33.6%**
  - Mailed Check: **22.9%**
  - Bank Transfer: **21.9%**
  - Credit Card: **21.6%**

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7. Next Steps (Suggestions for Further Analysis)

✅ Exploratory Data Analysis (EDA)

- Analyze customer behavior patterns affecting **churn rates**.
- Identify correlations between **tenure, contract type, and churn**.

✅ Visualizations & Insights

- Plot **Churn vs. Monthly Charges** to see how pricing affects retention.
- Visualize **Tenure vs. Churn Rate** to see customer loyalty trends.

✅ Feature Engineering (For Model Building)

- Encode categorical variables for future predictive modeling.
- Scale numerical features if required.