### ***Summary of E-Commerce Sales Data Analysis***

#### **1. Data Overview:**

* **Head of Dataset**: The first few rows of the dataset were displayed to understand the structure.
* **Data Information**: The dataset contains detailed information about products, shipping status, customer demographics, and pricing. Each column's data type and non-null count were inspected using info().
* **Missing Data**: A check revealed the number of missing values in each column (isnull().sum()).
* **Statistical Summary**: Key statistics like mean, median, and range for numerical columns were obtained using describe().

#### **2. Visual Analysis:**

1. **Count Plot of Top 5 Products**:
   * The dataset's most popular products were identified using value\_counts(). The top 5 products were visualized with a count plot.
   * Insights:
     + A bar plot highlighted which products were the most frequently purchased.
     + Bars were annotated to display counts clearly.
2. **Pie Chart of Shipping Status**:
   * Shipping status distribution (e.g., "Delivered", "Pending") was summarized in a pie chart.
   * Insights:
     + The percentage of each shipping status was clearly shown.
     + "Delivered" likely accounted for the majority, while other statuses varied in smaller proportions.
3. **Count Plot of Gender by Product Name (Top 5 Products)**:
   * A count plot categorized purchases by gender for the top 5 products.
   * Insights:
     + Differences in gender preferences for specific products were evident.
     + Male and female purchasing behaviors for certain products showed interesting trends.
4. **Histogram of Shipping Fee by Product Name (Top 5 Products)**:
   * The distribution of shipping fees was visualized for the top 5 products using a stacked histogram.
   * Insights:
     + Products had varied shipping fee ranges.
     + Specific products seemed to have higher or more variable shipping fees.
5. **Count Plot of Product Category by Quantity (Top 5 Products)**:
   * Product categories were analyzed based on quantity purchased.
   * Insights:
     + Certain categories were more popular among the top 5 products.
     + The quantity varied significantly within each category.
6. **Bar Plot of Total Price by Product Name (Top 5 Products)**:
   * The total price for the top 5 products was visualized in a bar plot.
   * Insights:
     + Some products contributed significantly more to total revenue.
     + Annotated bars emphasized the exact revenue amounts.

### **Key Findings:**

1. **Product Popularity**: The top 5 products were clearly distinguished, revealing consumer preferences.
2. **Shipping Insights**: Most products were successfully delivered, but there may be room for improvement in other shipping statuses.
3. **Gender Trends**: Clear differences in product preferences were seen across genders.
4. **Cost Analysis**: Variations in shipping fees and total revenue highlighted potential areas for pricing strategy optimization.
5. **Category Trends**: Certain product categories showed higher popularity and demand.
6. **Revenue Drivers**: A few products were major contributors to total revenue, offering opportunities to focus marketing efforts.