### **Exercise 1: Plotting Product Characteristics**

**Step 1: Creating a DataFrame**

Create a product DataFrame named "ProductDetails" with columns: "Category," "Name," "Price," and "Rating." Include at least 6 different products.

**Step 2: Popular Products**

Highly Filter products with a "Rating" greater than 4.2 and create a new DataFrame containing these highly rated products.

**Step 3: Budget-friendly Picks**

Filter products with a "Price" less than 70 units and create a new DataFrame containing these affordable products.

**Step 4: Premium and Top-rated Products**

Filter products with a "Price" greater than 120 units and a "Rating" greater than 4.5. Create a new DataFrame containing these premium and top-rated products.

**Step 5: Sorting and Selecting**

Select products with a "Price" greater than 40 units and a "Rating" greater than 3.8. Sort these products in descending order based on the "Rating" column and create a new DataFrame.

### **Exercise2 : Exploring Student Performance Through Visualization**

**Step 1: Creating a DataFrame**

Create a DataFrame named "StudentScores" with columns: "StudentID," "Name," "MathScore," "EnglishScore," and "ScienceScore." Include records for at least 8 students with randomly assigned scores.

**Step 2: Scatter Plot of Math and English Scores**

Visualize the correlation between Math and English scores by plotting a scatter plot. Use the **plot()** method on the DataFrame, selecting only the "MathScore" and "EnglishScore" columns. Provide axis labels and a title for a clearer representation.

**Step 3: Distribution of Science Scores**

Explore the distribution of Science scores by creating a bar chart. Use **plot()** with **kind="bar"** on the "ScienceScore" column to depict the spread of scores. Include axis labels and a title for better interpretation.

**Step 4: Pie Chart of Gender Distribution**

Illustrate the gender distribution in the dataset using a pie chart. Utilize the **value\_counts()**method on the "Gender" column and then apply **plot()** with **kind="pie"**. Include a legend for clarity.

**Step 5: Bar Chart of Math Scores Ranges**

Break down the Math scores into ranges (e.g., 0-50, 50-70, 70-90, 90-100) and visualize the count of students within each range using a bar chart. Utilize **plot()** with **kind="bar"** on the "MathScore" column, and provide axis labels and a title for a comprehensive view.

### **Exercise 3: Analyzing Employee Data Through Visualization**

**Step 1: Creating a DataFrame**

Create a DataFrame named "EmployeeData" with columns: "EmployeeID," "Name," "Salary," "YearsOfExperience," and "PerformanceScore." Include records for at least 10 employees with randomly assigned data.

**Step 2: Line Plot of Salary Over Years**

Visualize the trend of salary changes over years of experience by creating a line plot. Use **plot()** with **kind="line"** on the "YearsOfExperience" and "Salary" columns. Include axis labels and a title for a meaningful representation.

**Step 3: Distribution of Performance Scores**

Explore the distribution of performance scores by creating a pie chart. Utilize the **value\_counts()** method on the "PerformanceScore" column and then apply **plot()** with **kind="pie"**. Include a legend to clarify the performance score categories.

**Step 4: Bar Chart of Employee Salaries**

Represent the distribution of employee salaries through a bar chart. Use **plot()** with **kind="bar"** on the "Salary" column, and categorize salary ranges for better insight (e.g., 0-50000, 50000-75000, 75000-100000). Include axis labels and a title for clarity.

### **Exercise 5: Visualizing Sales Data**

**Step 1: Creating a DataFrame**

Create a DataFrame named "SalesData" with columns: "ProductID," "ProductName," "QuantitySold," "Revenue," and "Region." Include records for at least 6 different products sold in various regions.

**Step 2: Bubble Plot of Quantity Sold and Revenue**

Visualize the relationship between quantity sold and revenue using a bubble plot. Use **plot()** with **kind="scatter"** on the "QuantitySold" and "Revenue" columns, and represent each data point as a bubble. The size of each bubble should correspond to the product's revenue. Include axis labels and a title.

**Step 3: Region-wise Revenue Distribution**

Explore the distribution of revenue across different regions by creating a bar chart. Use **plot()** with **kind="bar"** on the "Region" column, and represent the total revenue for each region. Include axis labels and a title for clear interpretation.

**Step 4: Pie Chart of Product Sales Proportions**

Illustrate the proportion of sales for each product using a pie chart. Utilize the **value\_counts()** method on the "ProductName" column and then apply **plot()** with **kind="pie"**. Include a legend to identify each product.