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## Assignment 3

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### Problem Statement

Visualize the data using R/Python by plotting the graphs for Assignment No. 1 and 2. Consider a suitable dataset. Use a **Scatter plot, Bar plot, Box plot, Pie chart**, and **Line Chart** for visualization.

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### Objectives

1. To introduce and explore basic visualization techniques in Python using **Seaborn** and **Matplotlib**.
2. To demonstrate how to visualize data using different plot types, including **Scatter plot**, **Bar plot**, **Box plot**, **Pie chart**, and **Line chart**.
3. To analyse a suitable dataset using various plot types for better insights and understanding.

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### Resources Used

- **Software Used**: Google Colab
- **Libraries Used**: Pandas, Matplotlib, Seaborn

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# Introduction

### Seaborn

- Seaborn is a powerful Python data visualization library built on top of Matplotlib.
- It provides a high-level interface for drawing attractive and informative statistical graphics.
- **Key Features**:
    - Built-in themes and color palettes
    - Integration with Pandas DataFrames
    - Support for complex visualizations with simple syntax

### Matplotlib

- Matplotlib is a fundamental plotting library in Python used to create static, animated, and interactive plots.
- It is highly customizable and provides support for all basic plot types.
- **Key Features**:
    - Extensive range of plot types: line, scatter, bar, pie, etc.
    - Full control over plot appearance
    - Integrates well with NumPy and Pandas

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## Methodology

For this assignment, visualizations were created using the following plot types:

1. **Bar Plot**:
    - Used for comparing quantities across categories.

    - Each bar’s length is proportional to the value it represents.
2. **Scatter Plot**:
    - Shows the relationship between two continuous variables.
    - Each data point is represented as a dot on the X-Y plane.
3. **Box Plot**:
    - Represents the distribution of data through quartiles.
    - Displays the median, upper/lower quartiles, and outliers.
4. **Pie Chart**:
    - Depicts proportions of categories as slices of a circle.
    - Useful for visualizing parts of a whole.
5. **Line Chart**:
    - Shows data trends over time or ordered observations.
    - Commonly used for time series data.

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## Conclusion

Data visualization is a crucial step in understanding and analyzing data effectively. Through this assignment, we utilized **Seaborn** and **Matplotlib** to create various types of plots, each offering unique insights:

- **Bar and Pie charts** helped represent categorical proportions.
- **Scatter and Line plots** showed relationships and trends.
- **Box plots** revealed the distribution and potential outliers.

These visualizations not only enhanced the interpretability of our data but also supported better decision-making. Developing a strong grasp of visualization techniques using Python is essential for data analysis and communication.