BEGINNER LEVEL

Matplotlib is a foundational Python library for producing static, publication-quality visualizations. Its main strengths are extensive customization, compatibility with numerous backends, and fine control over plot elements. It is especially favored for its versatility and for being the "last mile" plotting library in the Python ecosystem. Primary applications include exploratory data analysis, publication graphics, and custom chart types.

Seaborn is a high-level statistical graphics library built on top of Matplotlib. It integrates tightly with Pandas and simplifies the process for creating attractive, informative statistical plots with minimal code. Its primary strength lies in producing beautiful plots quickly, particularly for exploring distributions and relationships in datasets, as well as in statistical modeling and data exploration.

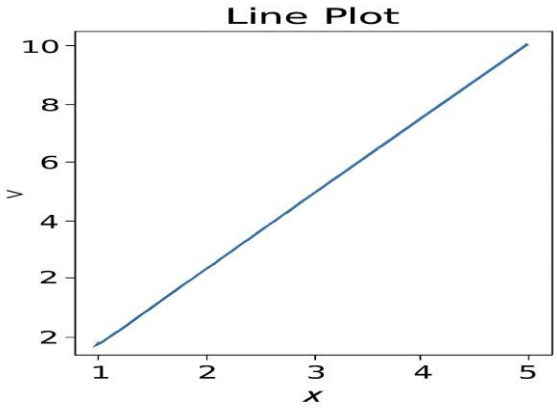
Matplotlib

1. Line Plot

- **Description**: Plots data points connected by lines. Used for time series, trends, or continuous data.
- **Use Case**: Stock prices over time, temperature readings.

python

```
import matplotlib.pyplot as plt

x = [1, 2, 3, 4, 5]

y = [2, 4, 6, 8, 10]

plt.plot(x, y)

plt.xlabel('X Axis')

plt.ylabel('Y Axis')

plt.title('Line Plot')

plt.show()
```

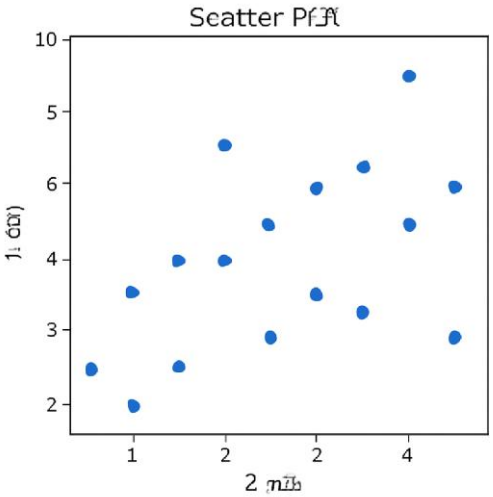


2. Scatter Plot

- **Description**: Plots points to show relationships between two variables.
- **Use Case**: Height vs. weight, exam score vs. study hours.

python

```
plt.scatter(x, y)
plt.xlabel('X Axis')
plt.ylabel('Y Axis')
plt.title('Scatter Plot')
plt.show()
```

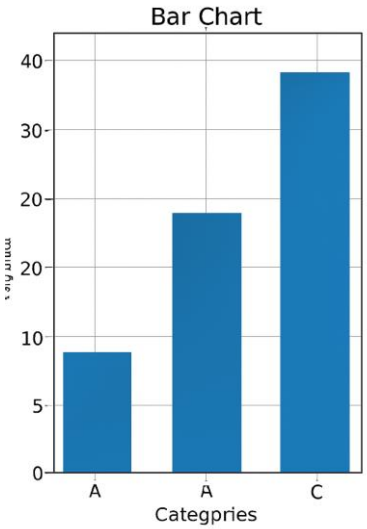


Bar Chart

- **Description**: Displays categorical data with rectangular bars.
- **Use Case**: Sales per region, frequency of events.

python

```
categories = ['A', 'B', 'C']
values = [10, 24, 36]
plt.bar(categories, values)
plt.xlabel('Category')
plt.ylabel('Value')
plt.title('Bar Chart')
plt.show()
```

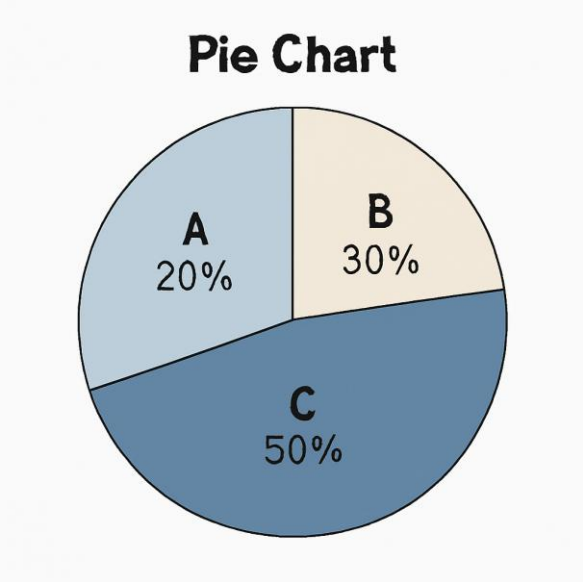


Pie Chart

- **Description**: Circular representation of proportions.
- **Use Case**: Market share, budget breakdown.

python

```
sizes = [20, 30, 50]
labels = ['A', 'B', 'C']
plt.pie(sizes, labels=labels)
plt.title('Pie Chart')
plt.show()
```



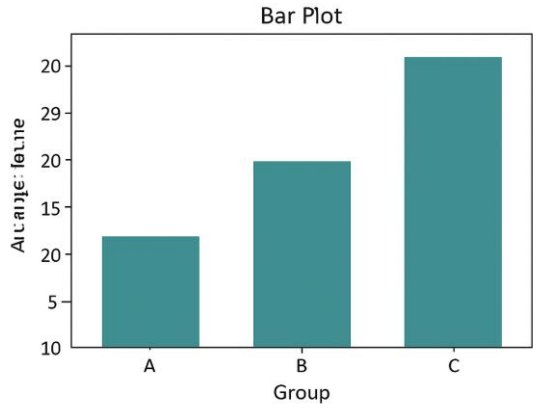
Seaborn

1. Bar Plot

- **Description**: Plots aggregate values or means for categorical data.
- **Use Case**: Average bill per day, mean scores by group.

python

```
import seaborn as sns
sns.barplot(data=df, x="group", y="score")
plt.title('Bar Plot')
plt.show()
```



Box Plot

- **Description**: Shows distribution with quartiles and outliers.
- **Use Case**: Examining spreads of test scores by class.

python

```
sns.boxplot(data=df, x="class", y="score")
plt.title('Box Plot')
plt.show()
```