



Python Data Visualization Cheat Sheet – Matplotlib & Seaborn

◆ Matplotlib – Basic Plots

Line Plot

- ◆ **Used for** visualizing trends over time.

```
import matplotlib.pyplot as plt

x = [1, 2, 3, 4, 5]
y = [10, 20, 25, 30, 40]

plt.plot(x, y, marker='o', linestyle='-', color='b', label="Trend")
plt.xlabel("X-axis")
plt.ylabel("Y-axis")
plt.title("Line Plot Example")
plt.legend()
plt.grid(True)
plt.show()
```

Bar Plot

- ◆ **Used for** comparing categorical data.

```
categories = ['A', 'B', 'C', 'D']
values = [10, 25, 17, 30]

plt.bar(categories, values, color='skyblue', edgecolor='black')
plt.xlabel("Categories")
plt.ylabel("Values")
plt.title("Bar Plot Example")
plt.show()
```

Scatter Plot

- ◆ **Used for** visualizing relationships between variables.

```
import numpy as np

x = np.random.rand(50)
y = np.random.rand(50)

plt.scatter(x, y, color='red', marker='x')
plt.xlabel("X-axis")
plt.ylabel("Y-axis")
plt.title("Scatter Plot Example")
plt.show()
```

Histogram

- ◆ **Used for** showing frequency distributions.

```
data = np.random.randn(1000)

plt.hist(data, bins=20, color='blue', edgecolor='black')
plt.xlabel("Value")
plt.ylabel("Frequency")
plt.title("Histogram Example")
plt.show()
```

Pie Chart

- ◆ **Used for** displaying proportions.

```
labels = ['A', 'B', 'C', 'D']
sizes = [25, 35, 20, 20]
colors = ['gold', 'lightblue', 'lightgreen', 'pink']

plt.pie(sizes, labels=labels, colors=colors, autopct='%1.1f%%', startangle=90)
plt.title("Pie Chart Example")
plt.show()
```

Box Plot

- ◆ **Used for** showing data distribution and detecting outliers.

```
data = [np.random.randn(100), np.random.randn(100) + 2, np.random.randn(100) - 2]

plt.boxplot(data, labels=['A', 'B', 'C'])
plt.xlabel("Category")
plt.ylabel("Values")
plt.title("Box Plot Example")
plt.show()
```

Heatmap (Using Seaborn)

- ◆ **Used for** showing relationships in matrices.

```
import seaborn as sns

data = np.random.rand(5, 5)
sns.heatmap(data, annot=True, cmap='coolwarm')

plt.title("Heatmap Example")
plt.show()
```

Matplotlib Color Palettes

- ◆ **Basic Colors**

- 'r' = Red
- 'g' = Green
- 'b' = Blue
- 'c' = Cyan
- 'm' = Magenta

- 'y' = Yellow
- 'k' = Black

◆ Colormaps (for Gradients)

Colormap	Usage
viridis	Default colormap
plasma	Bright gradient
inferno	Darker colormap
coolwarm	Good for positive/negative values

◆ Seaborn – Advanced Plots

Seaborn Line Plot

- ◆ Used for trends with confidence intervals.

```
import seaborn as sns
import pandas as pd

data = pd.DataFrame({'x': range(10), 'y': [i + (i%3) for i in range(10)]})
sns.lineplot(x='x', y='y', data=data, marker='o')

plt.title("Seaborn Line Plot")
plt.show()
```

Seaborn Bar Plot

- ◆ Used for categorical comparisons.

```
sns.barplot(x=['A', 'B', 'C', 'D'], y=[10, 25, 17, 30], palette='coolwarm')

plt.title("Seaborn Bar Plot")
plt.show()
```

Seaborn Scatter Plot

- ◆ Used for relationships between variables.

```
import numpy as np

x = np.random.rand(50)
y = np.random.rand(50)

sns.scatterplot(x=x, y=y, color='red', marker='x')
plt.title("Seaborn Scatter Plot")
plt.show()
```

Seaborn Histogram (Distribution Plot)

- ◆ Used for showing distributions.

```
data = np.random.randn(1000)

sns.histplot(data, bins=20, color='blue', kde=True)
plt.title("Seaborn Histogram")
plt.show()
```

Seaborn Pie Chart (Workaround using Matplotlib)

```
labels = ['A', 'B', 'C', 'D']
sizes = [25, 35, 20, 20]
colors = sns.color_palette('pastel')

plt.pie(sizes, labels=labels, colors=colors, autopct='%1.1f%%', startangle=90)
plt.title("Seaborn Pie Chart")
plt.show()
```

Seaborn Box Plot

- ◆ Used for distribution and outliers.

```
sns.boxplot(data=[np.random.randn(100), np.random.randn(100) + 2, np.random.randn(100) - 2])

plt.title("Seaborn Box Plot")
plt.show()
```

Seaborn Heatmap

- ◆ **Used for** visualizing correlations.

```
import seaborn as sns
import numpy as np

data = np.random.rand(5, 5)
sns.heatmap(data, annot=True, cmap='coolwarm')

plt.title("Seaborn Heatmap")
plt.show()
```



Seaborn Color Palettes

Seaborn provides **built-in color palettes** that can be used with `palette=`.

Palette Name	Usage
deep	Default color palette
pastel	Soft colors
muted	Less saturated colors
bright	Vivid colors
dark	Darker colors
colorblind	Colorblind-friendly

- ◆ **Applying a Seaborn Color Palette**

```
sns.barplot(x=['A', 'B', 'C', 'D'], y=[10, 25, 17, 30], palette='pastel')
plt.title("Seaborn Bar Plot with Pastel Palette")
plt.show()
```



Final Summary

Plot Type	Matplotlib Function	Seaborn Function
Line Plot	<code>plt.plot()</code>	<code>sns.lineplot()</code>
Bar Chart	<code>plt.bar()</code>	<code>sns.barplot()</code>
Scatter Plot	<code>plt.scatter()</code>	<code>sns.scatterplot()</code>
Histogram	<code>plt.hist()</code>	<code>sns.histplot()</code>
Pie Chart	<code>plt.pie()</code>	(Matplotlib only)
Box Plot	<code>plt.boxplot()</code>	<code>sns.boxplot()</code>
Heatmap	<code>sns.heatmap()</code>	<code>sns.heatmap()</code>

- ✓ **Matplotlib** is great for static visualizations, while **Seaborn** enhances aesthetics.
- ✓ Use **colormaps & color palettes** to improve visualization.
- ✓ Choose **Seaborn** for more elegant, readable charts.