Matplotlib Cheatsheet

Matplotlib is a widely used library for data visualization in Python.

---

1. Basic Plotting

- **plt.plot(x, y)** - Plots a line graph.
- **plt.scatter(x, y)** - Creates a scatter plot.
- **plt.bar(x, height)** - Creates a bar chart.
- **plt.hist(data, bins=n)** - Creates a histogram.
- **plt.pie(sizes, labels=labels)** - Creates a pie chart.
- **plt.boxplot(data)** - Creates a box plot.
- **plt.errorbar(x, y, yerr=errors)** - Adds error bars to a plot.
- **plt.stem(x, y)** - Creates a stem plot.

---

2. Customizing Plots

- **plt.xlabel(label)** - Sets the x-axis label.
- **plt.ylabel(label)** - Sets the y-axis label.
- **plt.title(label)** - Sets the title of the plot.
- **plt.legend()** - Displays a legend.
- **plt.grid(True)** - Adds a grid to the plot.
- **plt.xlim(min, max)** - Sets limits for the x-axis.
- **plt.ylim(min, max)** - Sets limits for the y-axis.
- **plt.xticks(ticks, labels)** - Customizes x-axis ticks.
- **plt.yticks(ticks, labels)** - Customizes y-axis ticks.
- **plt.text(x, y, 'text')** - Adds text at specified location.
- **plt.annotate('text', xy=(x, y))** - Annotates a point on the plot.

---

3. Figure and Subplots

- **plt.figure(figsize=(w, h))** - Creates a new figure.
- **plt.subplot(rows, cols, index)** - Creates subplots in a figure.
- **fig, ax = plt.subplots()** - Creates a figure and axes.

- **ax.plot(x, y)** - Plots on the given axes.
- **fig.savefig('filename.png')** - Saves the figure as an image.

---

4. Colors, Markers, and Line Styles

- **plt.plot(x, y, color='r')** - Sets line color to red.
- **plt.plot(x, y, linestyle='--')** - Sets dashed line style.
- **plt.plot(x, y, marker='o')** - Adds circular markers.
- **plt.scatter(x, y, c='b', marker='x')** - Customizes scatter plot.

---

5. 3D Plotting (Using mpl_toolkits.mplot3d)

- **ax = plt.axes(projection='3d')** - Creates a 3D plot.
- **ax.plot3D(x, y, z)** - Plots a 3D line.
- **ax.scatter3D(x, y, z, c=z)** - Creates a 3D scatter plot.
- **ax.set_xlabel('X Label')** - Sets x-axis label in 3D plot.
- **ax.set_ylabel('Y Label')** - Sets y-axis label in 3D plot.
- **ax.set_zlabel('Z Label')** - Sets z-axis label in 3D plot.

---

6. Advanced Plot Customization

- **plt.colormaps()** - Lists available colormaps.
- **plt.imshow(data, cmap='viridis')** - Displays an image with colormap.
- **plt.contour(X, Y, Z)** - Creates a contour plot.
- **plt.fill_between(x, y1, y2, color='gray', alpha=0.5)** - Shades the area between curves.
- **plt.twinx()** - Creates a secondary y-axis.
- **plt.cla()** - Clears the current axes.
- **plt.clf()** - Clears the current figure.
- **plt.close()** - Closes the current figure.

Official documentation: https://matplotlib.org/stable/contents.html