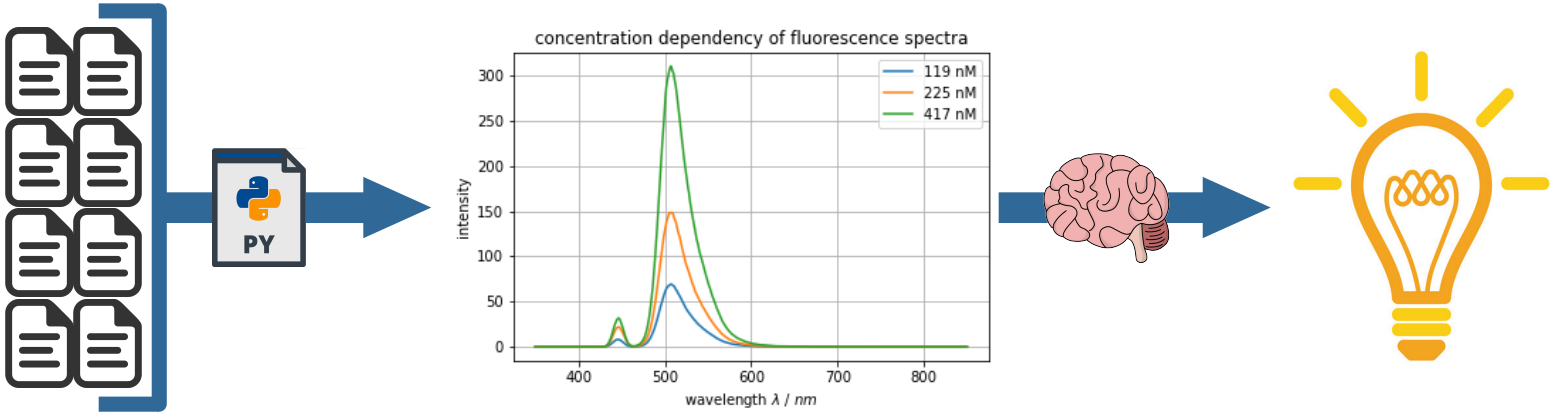
Creating Plots with Matplotlib

Common Workflow



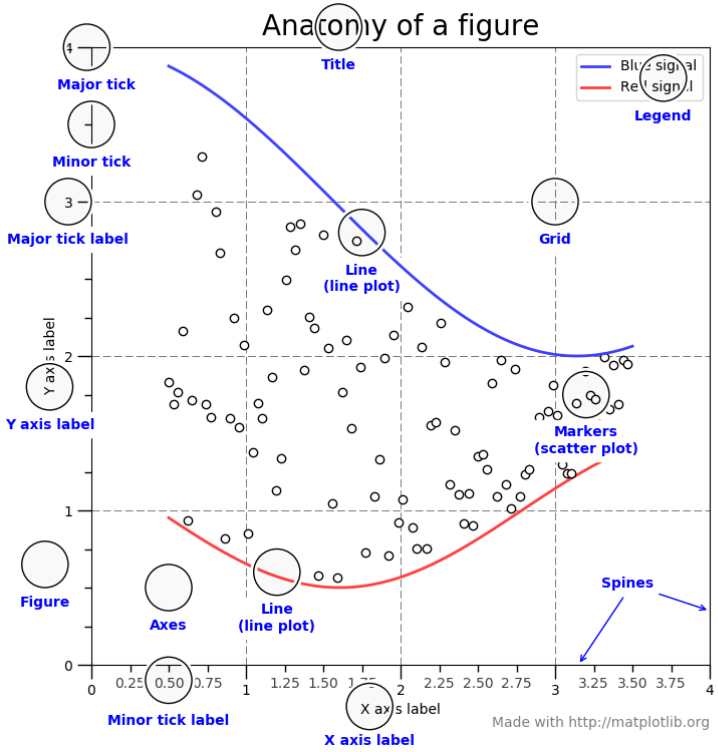
Pyplot

```
# Import pyplot
from matplotlib import pyplot as plt

# Create a plot
plt.plot(x_values, y_values, …)

# Save the plot to file
plt.savefig(“path/to/image.png”)
```

Tutorials and Advanced Techniques:
https://matplotlib.org/stable/tutorials/index.html

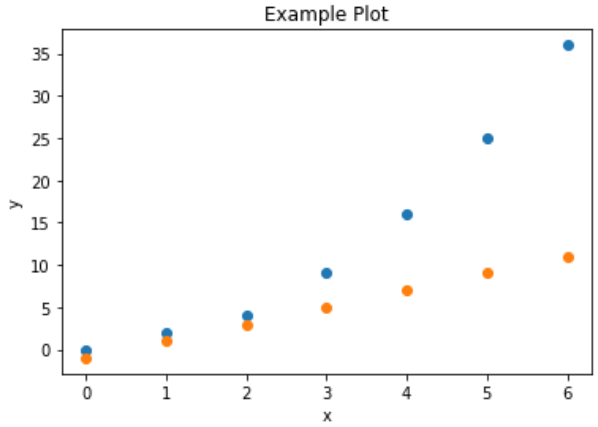
Examples and Possibilities:
https://matplotlib.org/stable/gallery/index.html

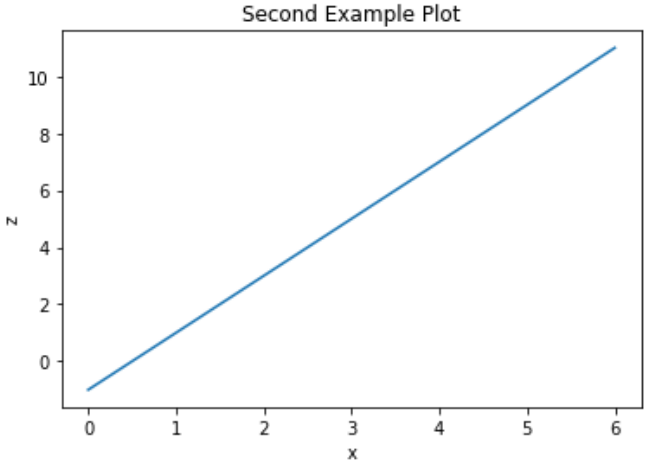
Google The Right Things



Plotting Data

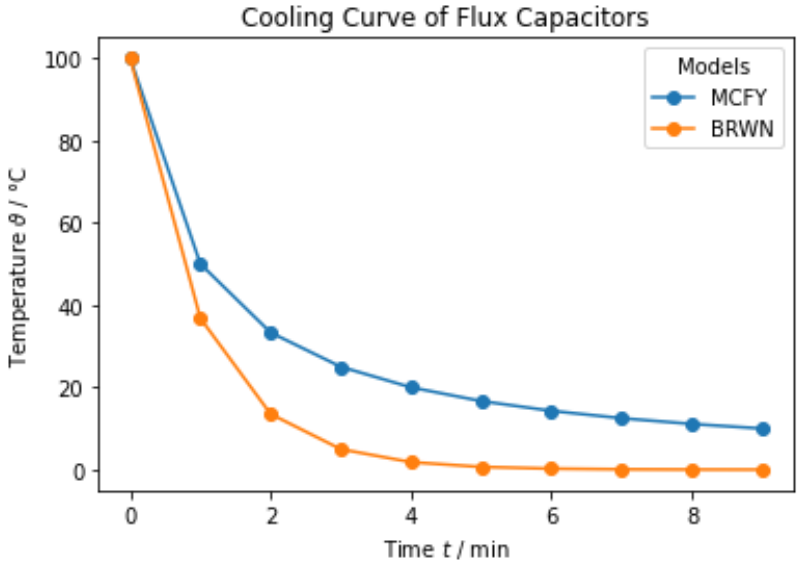
```python
# Handles plotting
from matplotlib import pyplot as plt

# Create dummy data
x = [0, 1, 2, 3, 4, 5, 6]
y = [0, 2, 4, 9, 16, 25, 36]

# Create plot
plt.scatter(x, y)
# Add labels to plot
plt.title("Example Plot")
plt.xlabel("x")
plt.ylabel("y")

# Add more data
z = [-1, 1, 3, 5, 7, 9, 11]
plt.scatter(x, z)

# End the plot
plt.show()

# Create a new plot
plt.plot(x, z)
plt.title("Second Example Plot")
plt.xlabel("x")
plt.ylabel("z")
```



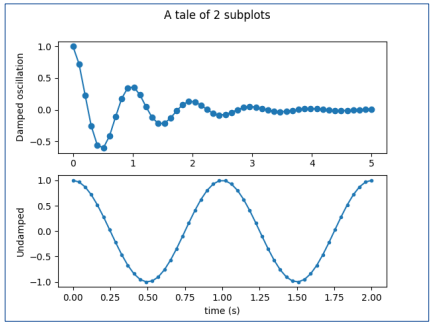


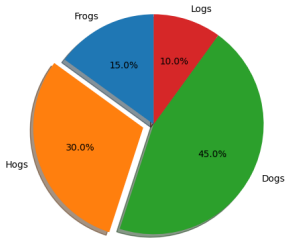
Adding a Legend

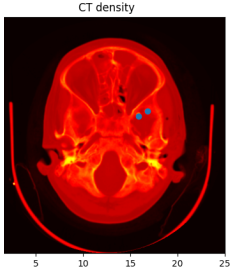
```
10  # Create some dummy data
11  experimentOne = {"time": [0, 1, 2, 3, 4, 5, 6, 7, 8, 9],
12                   "temperature": [100.00, 50.00, 33.33, 25.00, 20.00, 16.67, 14.29, 12.50, 11.11, 10.00] }
13  experimentTwo = {"time": [0, 1, 2, 3, 4, 5, 6, 7, 8, 9],
14                   "temperature": [100.00, 36.79, 13.53,  4.98,  1.83,  0.67,  0.25,  0.09,  0.03,  0.01] }
15
16  # Import module that creates plots
17  from matplotlib import pyplot as plt
18
19  # Create a plot with the dummy data
20  # The parameter "-o" creates a lineplots with dot marks.
21  # The label parameter assures that the curves will be colored and added to the legend
22  #
23  # Add first dictionary
24  plt.plot("time", "temperature", "-o", data = experimentOne, label = "MCFY")
25  # Add second dictionary
26  plt.plot("time", "temperature", "-o", data = experimentTwo, label = "BRWN")
27  # Add titles and axis labels
28  plt.title("Cooling Curve of Flux Capacitors")
29  plt.xlabel("Time $t$ / min")
30  plt.ylabel(r"Temperature $\vartheta$ / °C")
31  # Add a legend. Give the legend a descriptive title.
    plt.legend(title = "Models")
```

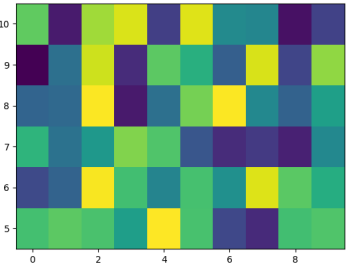


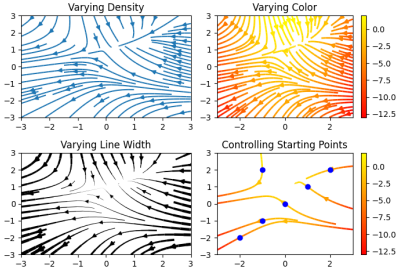
Further Possibility

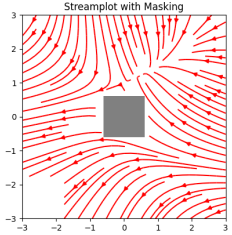


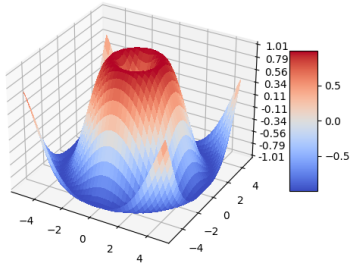


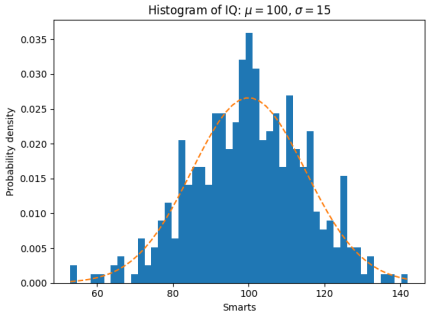


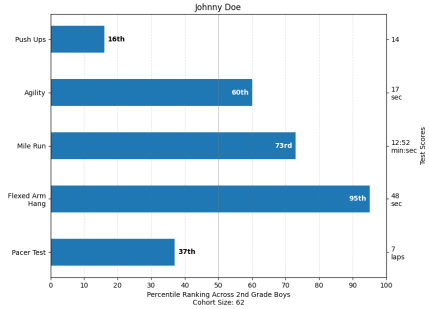


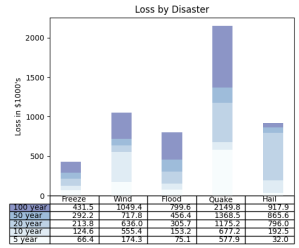












and more on matplotlib.org

Exercise 11: Creating Plots

Create your first plot

It doesn’t matte what your plotting.

Try to change the axis labels and the title.

Add a legend.