Matplotlib for beginners

Matplotlib is a library for making 2D plots in Python. It is designed with the philosophy that you should be able to create simple plots with just a few commands:

1. **Initialize**
   ```python
   import numpy as np
   import matplotlib.pyplot as plt
   ```

2. **Prepare**
   ```python
   X = np.linspace(0, 2*np.pi, 1000)
   Y = np.sin(X)
   ```

3. **Render**
   ```python
   fig, ax = plt.subplots()
   ax.plot(X, Y)
   ```

4. **Observe**
   ```python
   fig.show()
   ```

**Tweak**
You can modify pretty much anything in a plot, including limits, colors, markers, line width and styles, ticks and ticks labels, titles, etc.

Choose
Matplotlib offers several kind of plots (see Gallery):

- **Scatter**
  ```python
  X = np.random.uniform(0, 1, 100)
  Y = np.random.uniform(0, 1, 100)
  ax.scatter(X, Y)
  ```

- **Bar**
  ```python
  X = np.arange(10)
  Y = np.random.uniform(0, 1, 10)
  ax.bar(X, Y)
  ```

- **Imshow**
  ```python
  X = np.random.uniform(0, 1, (8,8))
  ax.imshow(X)
  ```

Organize
You can plot several data on the same figure, but you can also split a figure in several subplots (named Axes):

- **Subplots**
  ```python
  fig, (ax1, ax2) = plt.subplots((1,2))
  ax1.plot(X, Y)
  ax2.plot(Y, X)
  ```

Label (everything)
```python
ax.plot(X, Y)
ax.set_title("A Sine wave")
```