Data Visualization

Python and R for Data Science

Data Science and Management

Package `matplotlib`

`matplotlib`: installation and import

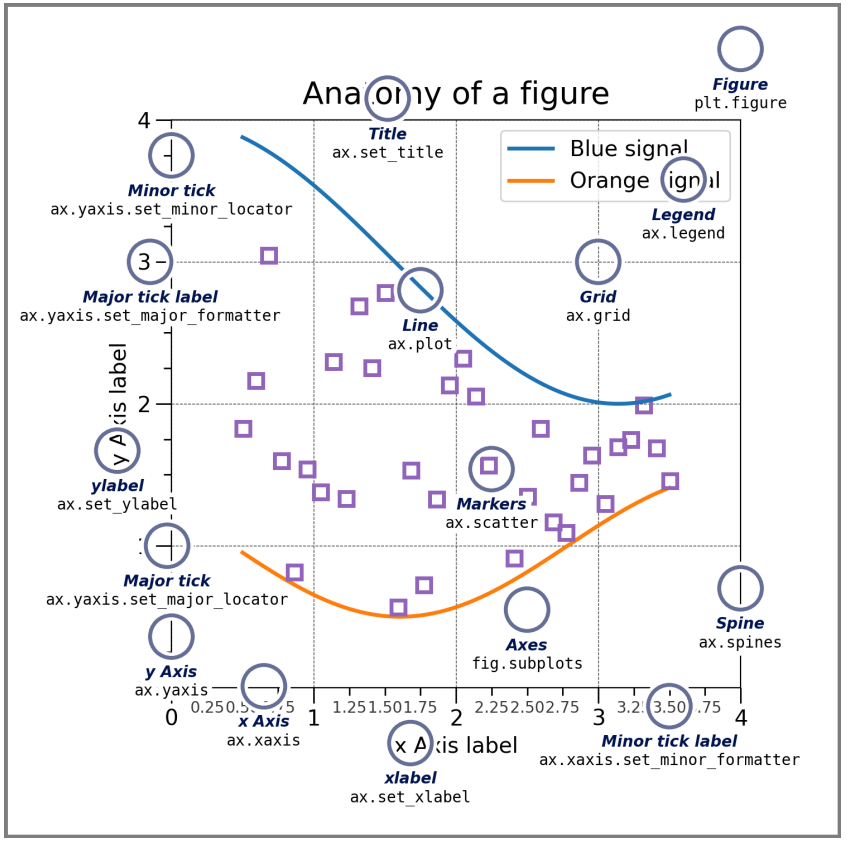
In [9]:
```
! pip3 install matplotlib pandas numpy
```

```
Defaulting to user installation because normal site-packages is
not writeable
Requirement already satisfied: matplotlib in /usr/lib/python3/d
ist-packages (3.5.1)
Requirement already satisfied: pandas in /home/ercoppa/.local/l
ib/python3.10/site-packages (2.2.2)
Requirement already satisfied: numpy in /home/ercoppa/.local/li
b/python3.10/site-packages (1.26.4)
Requirement already satisfied: pytz>=2020.1 in /usr/lib/python
3/dist-packages (from pandas) (2022.1)
Requirement already satisfied: tzdata>=2022.7 in /home/ercopp
a/.local/lib/python3.10/site-packages (from pandas) (2024.1)
Requirement already satisfied: python-dateutil>=2.8.2 in /usr/l
ocal/lib/python3.10/dist-packages (from pandas) (2.9.0.post0)
Requirement already satisfied: six>=1.5 in /usr/lib/python3/dis
t-packages (from python-dateutil>=2.8.2->pandas) (1.16.0)
```

In [10]:
```
import matplotlib.pyplot as plt
import pandas as pd
import numpy as np
```

Anatomy of a `matplolib` figure

Example **Key elements**



- Figure
- Axes
- Plot type: e.g., line
- Plot title
- Markers
- Grid
- Spine
- Legend
- Axes, {major,minor} ticks
- {x,y}label, {major,minor} tick label

`matplolib`: style

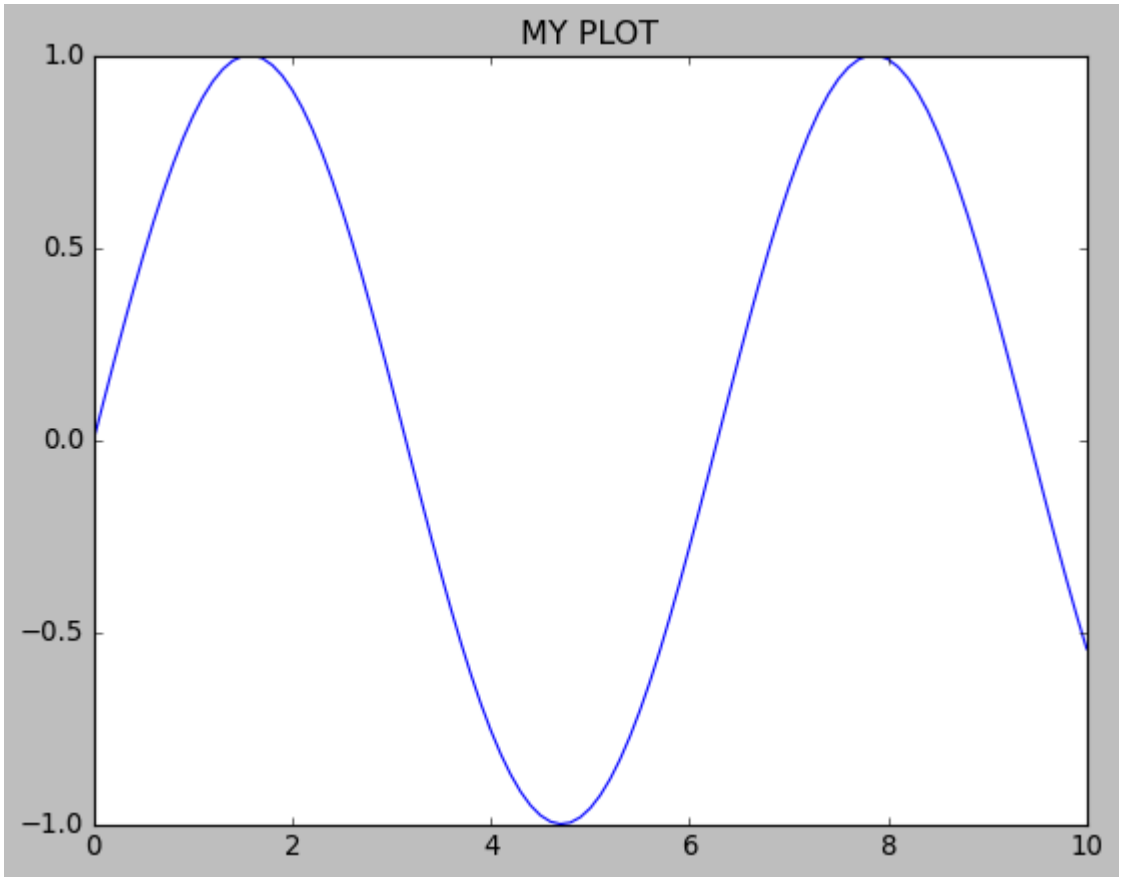
Plots can be theme

In [12]:
```
print(' '.join(plt.style.available))
```

```
Solarize_Light2 _classic_test_patch _mpl-gallery _mpl-gallery-n
ogrid bmh classic dark_background fast fivethirtyeight ggplot g
rayscale seaborn seaborn-bright seaborn-colorblind seaborn-dark
seaborn-dark-palette seaborn-darkgrid seaborn-deep seaborn-mute
d seaborn-notebook seaborn-paper seaborn-pastel seaborn-poster
seaborn-talk seaborn-ticks seaborn-white seaborn-whitegrid tabl
eau-colorblind10
```

In [8]:
```
plt.style.use("classic")
x = np.linspace(0, 10, 101) # create an array of 101 points from 0 to 1
plt.figure()              # create a plot figure
plt.title('MY PLOT') # add a title
plt.plot(x, np.sin(x))  # plot the sine of x
```

Out[8]:
```
[<matplotlib.lines.Line2D at 0x74865d9df100>]
```


MY PLOT
1.0
0.5
0.0
−0.5
−1.0
0
2
4
6
8
10

Package `seaborn`