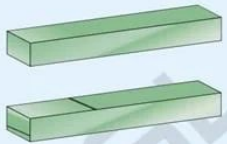
Data Visualization with Matplotlib

IDIOMATIC EXPRESSION

A PICTURE IS WORTH A THOUSAND WORDS

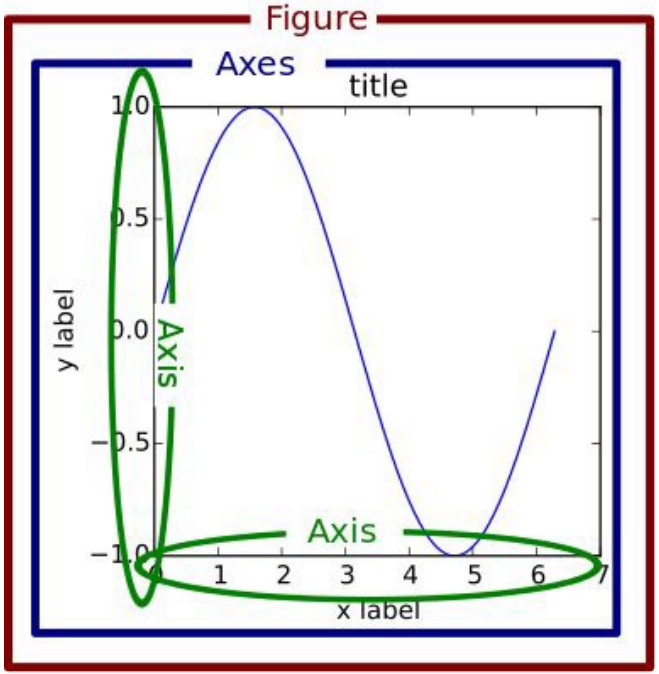
A picture is worth a thousand words is a phrase which talks about how a visual image can mean a lot more than words.

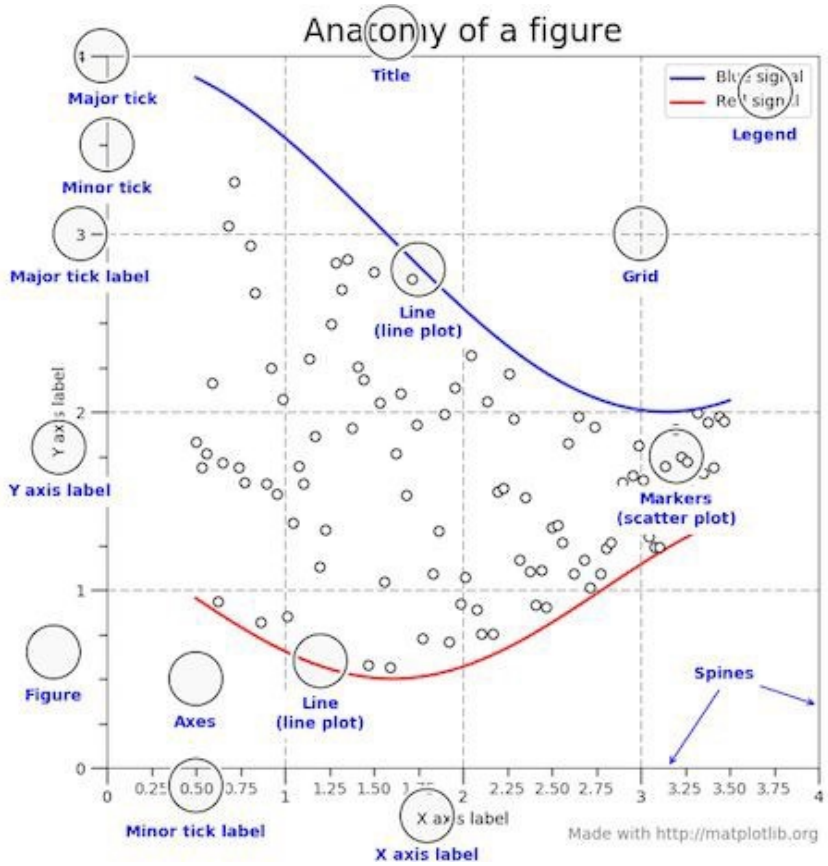
Is Worth



The Matplotlib Object Hierarchy

```
plt.plot([1, 2, 3])
```

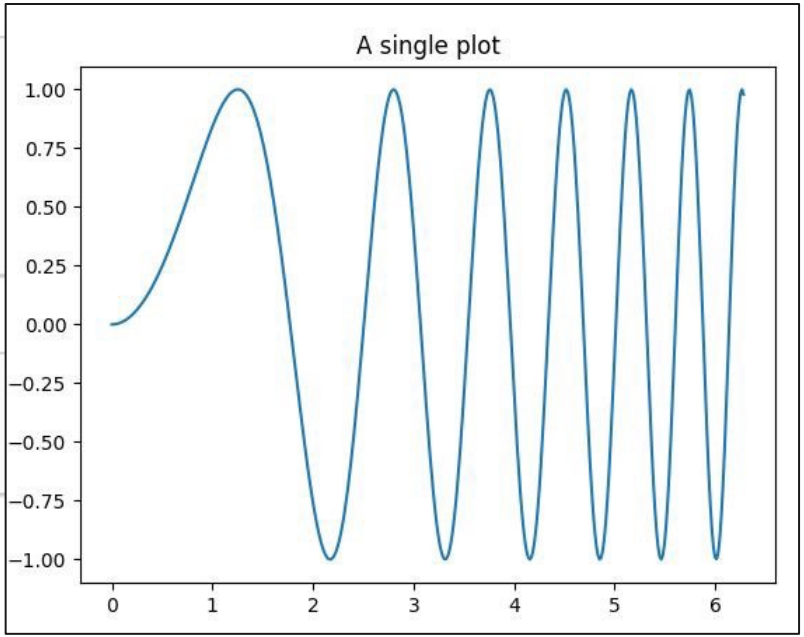



Anatomy of a figure
Title
Major tick
Minor tick
Major tick label
Legend
Grid
Line
(line plot)
Y axis label
Markers
(scatter plot)
Figure
Axes
Line
(line plot)
Spines
Minor tick label
X axis label
Made with http://matplotlib.org

Using plt.subplots for one subplot

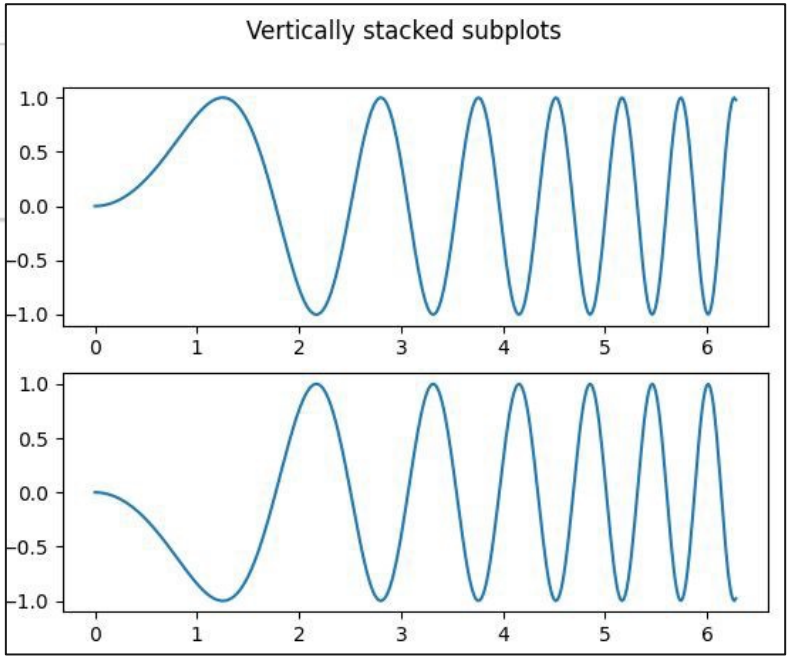
```
import matplotlib.pyplot as plt
import numpy as np

# Some example data to display
x = np.linspace(0, 2 * np.pi, 400)
y = np.sin(x ** 2)
```

```
fig, ax = plt.subplots()
ax.plot(x, y)
ax.set_title('A single plot')
```



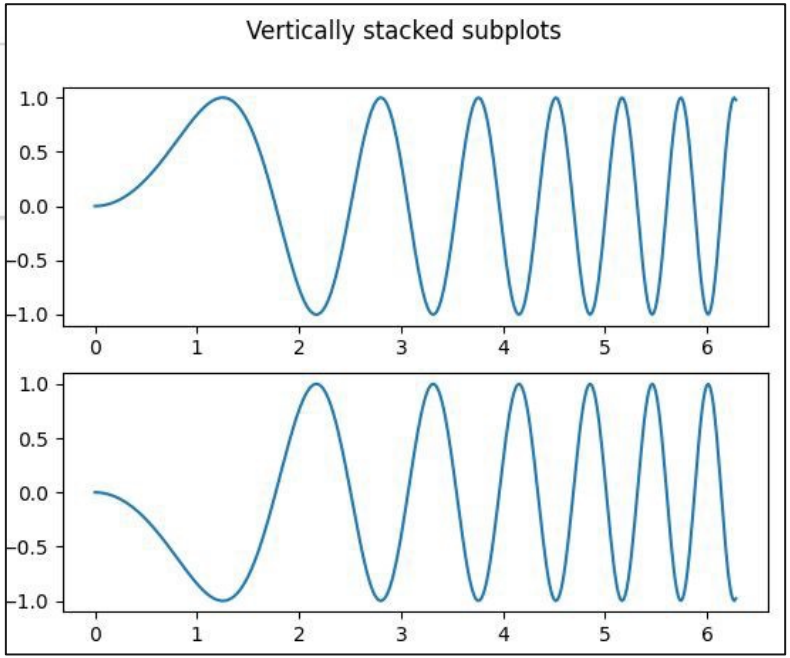
Using plt.subplots for stacking subplots in one direction

```
fig, axs = plt.subplots(2)
fig.suptitle('Vertically stacked subplots')
axs[0].plot(x, y)
axs[1].plot(x, -y)
```



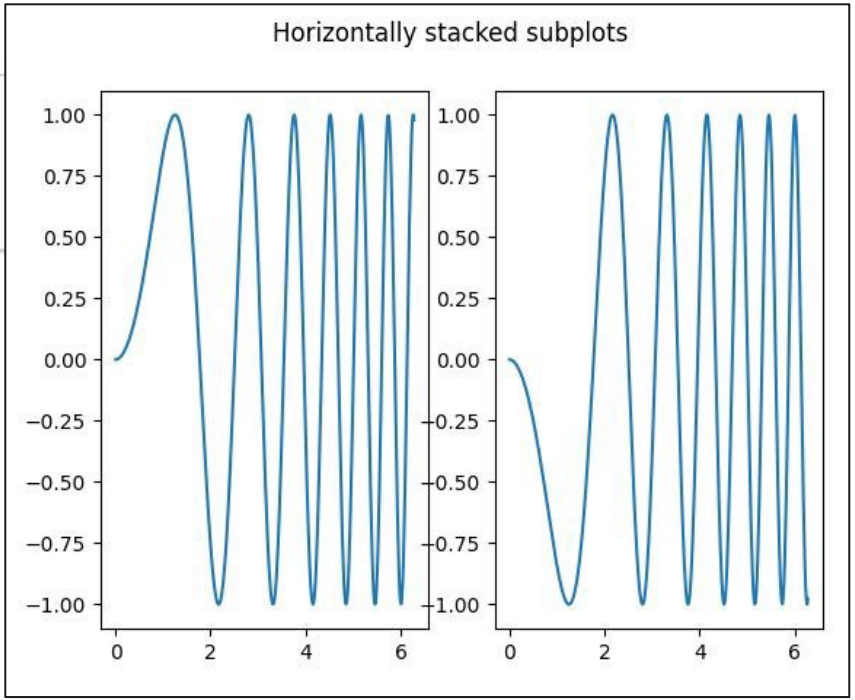
Using plt.subplots for stacking subplots in one direction

```
fig, (ax1, ax2) = plt.subplots(2)
fig.suptitle('Vertically stacked subplots')
ax1.plot(x, y)
ax2.plot(x, -y)
```



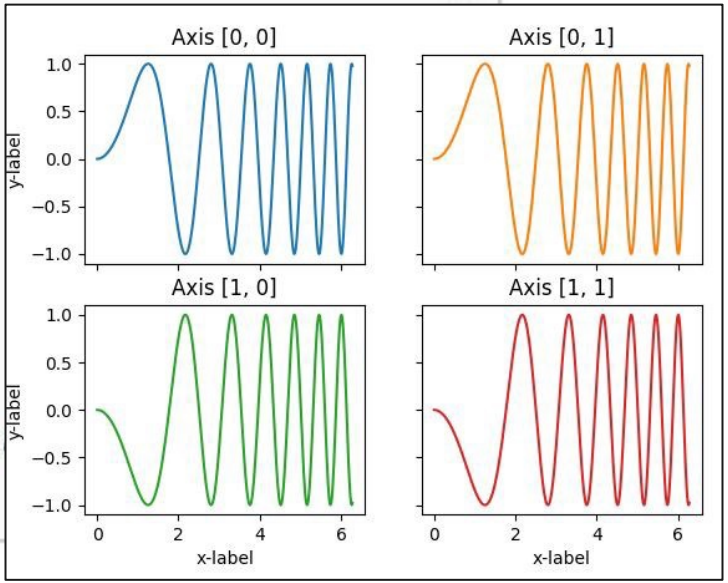
Horizontally stacked subplots

```
fig, (ax1, ax2) = plt.subplots(1, 2)
fig.suptitle('Horizontally stacked subplots')
ax1.plot(x, y)
ax2.plot(x, -y)
```



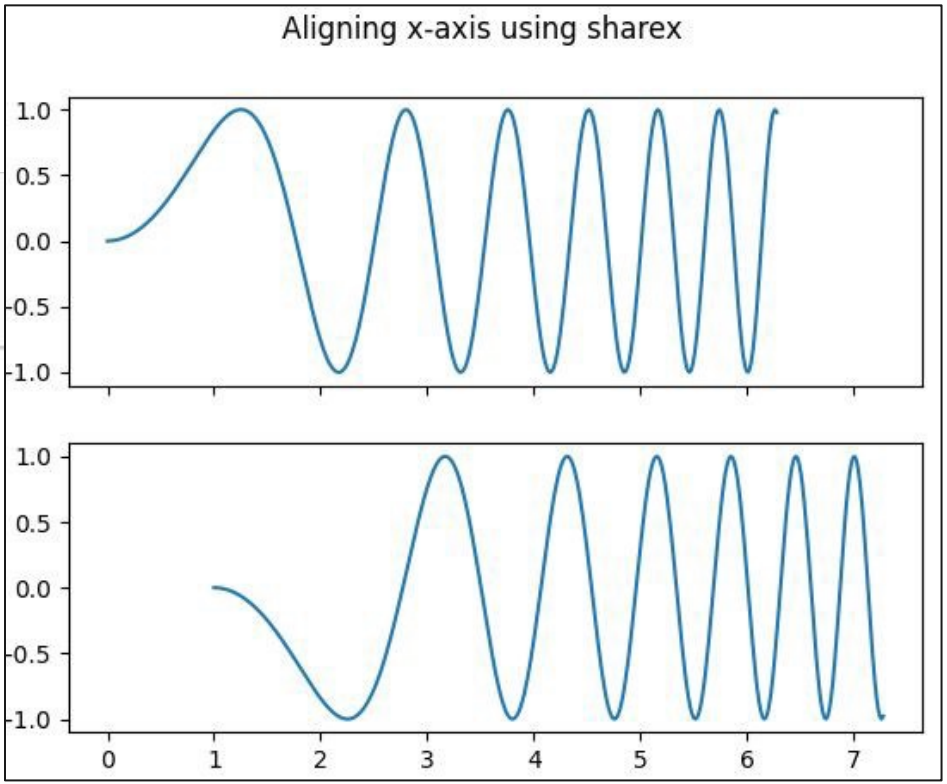
Stacking subplots in two directions

```
fig, axs = plt.subplots(2, 2)
axs[0, 0].plot(x, y)
axs[0, 0].set_title('Axis [0, 0]')
axs[0, 1].plot(x, y, 'tab:orange')
axs[0, 1].set_title('Axis [0, 1]')
axs[1, 0].plot(x, -y, 'tab:green')
axs[1, 0].set_title('Axis [1, 0]')
axs[1, 1].plot(x, -y, 'tab:red')
axs[1, 1].set_title('Axis [1, 1]')

for ax in axs.flat:
    ax.set(xlabel='x-label', ylabel='y-label')

# Hide x labels and tick labels for top plots and y ticks for right
for ax in axs.flat:
    ax.label_outer()
```



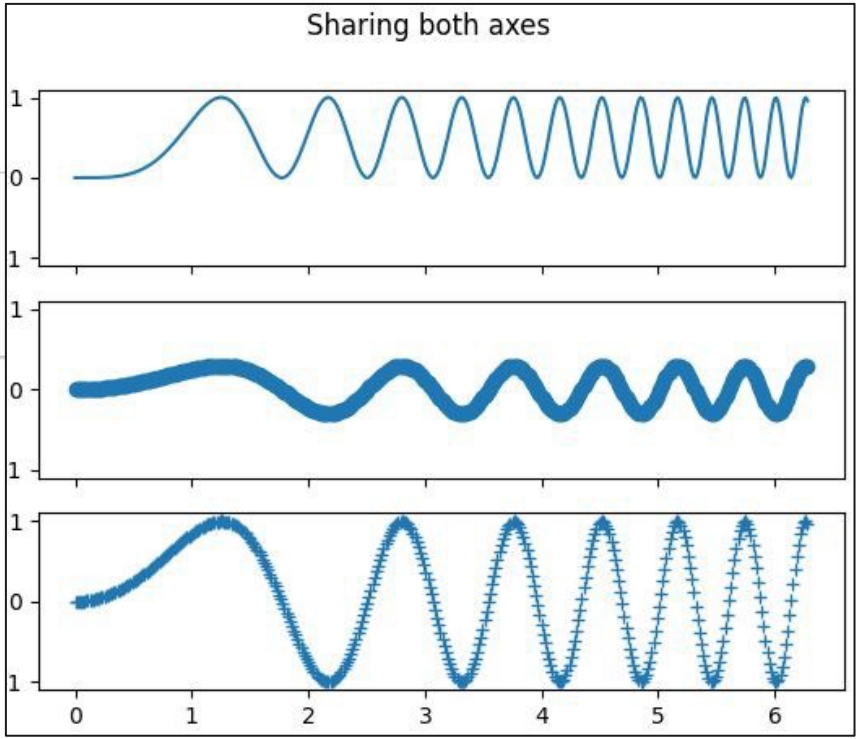
Sharing axes in subplots

```
fig, (ax1, ax2) = plt.subplots(2, sharex=True)
fig.suptitle('Aligning x-axis using sharex')
ax1.plot(x, y)
ax2.plot(x + 1, -y)
```



Sharing both axes

```
fig, axs = plt.subplots(3, sharex=True, sharey=True)
fig.suptitle('Sharing both axes')
axs[0].plot(x, y ** 2)
axs[1].plot(x, 0.3 * y, 'o')
axs[2].plot(x, y, '+')
```



Sharing *x* per column, *y* per row

```
fig = plt.figure()
gs = fig.add_gridspec(2, 2, hspace=0, wspace=0)
(ax1, ax2), (ax3, ax4) = gs.subplots(sharex='col', sharey='row')
fig.suptitle('Sharing x per column, y per row')
ax1.plot(x, y)
ax2.plot(x, y**2, 'tab:orange')
ax3.plot(x + 1, -y, 'tab:green')
ax4.plot(x + 2, -y**2, 'tab:red')

for ax in axs.flat:
    ax.label_outer()
```