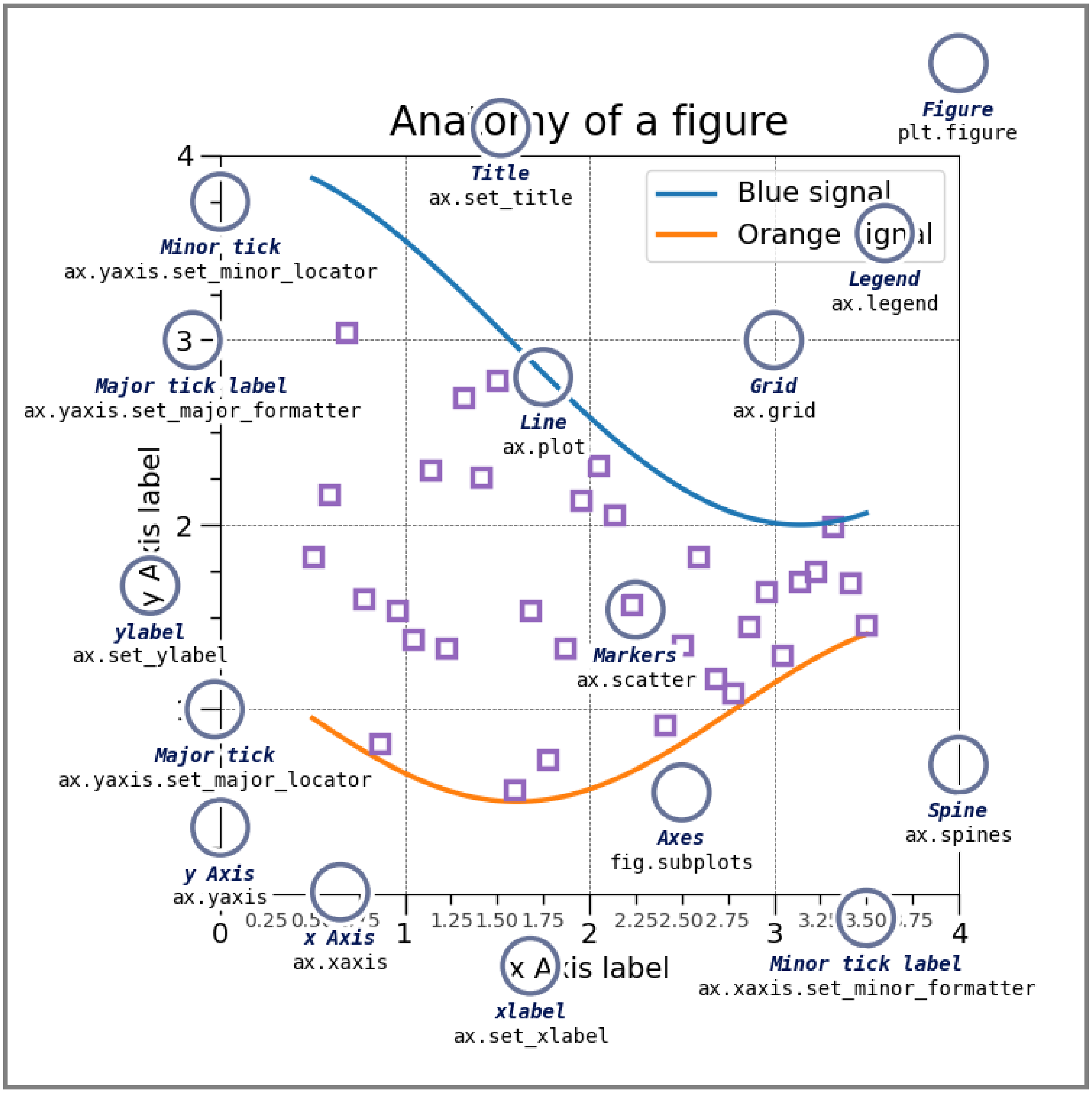
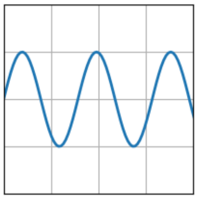
Quick start

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

X = np.linspace(0, 2*np.pi, 100)
Y = np.cos(X)

fig, ax = plt.subplots()
ax.plot(X, Y, color=‘green’)

fig.savefig(‘figure.pdf’)
plt.show()
```

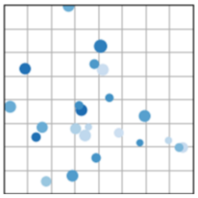
Anatomy of a figure



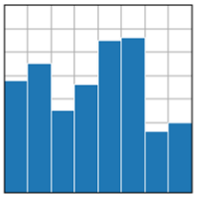
Basic plots



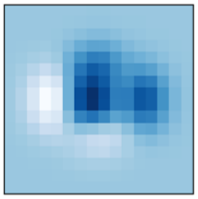
plot`([X], Y, [fmt], ...)`
X, **Y**, fmt, color, marker, linestyle



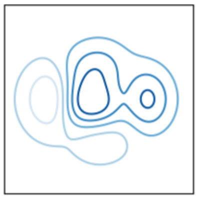
scatter`(X, Y, ...)`
X, **Y**, [s]izes, [c]olors, marker, cmap



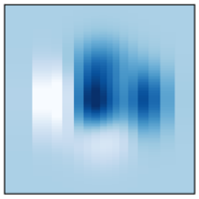
bar[h]`(x, height, ...)`
x, **height**, width, bottom, align, color



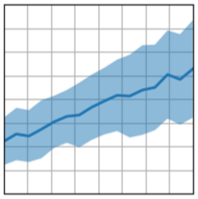
imshow`(Z, ...)`
Z, cmap, interpolation, extent, origin



contour[f]`([X], [Y], Z, ...)`
X, Y, **Z**, levels, colors, extent, origin

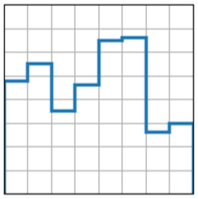


pcolormesh`([X], [Y], Z, ...)`
X, Y, **Z**, vmin, vmax, cmap

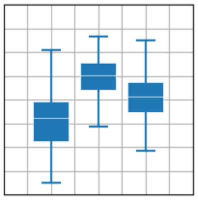


fill[_between][x]`(...)`
X, Y1, Y2, color, where

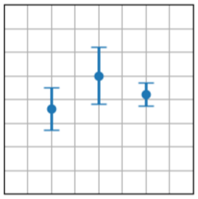
Advanced plots



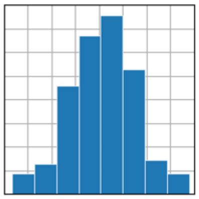
step(X, Y, [fmt], ...)
X, **Y**, fmt, color, marker, where



boxplot(X, ...)
X, notch, sym, bootstrap, widths

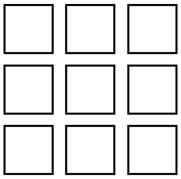


errorbar(X, Y, xerr, yerr, ...)
X, **Y**, xerr, yerr, fmt

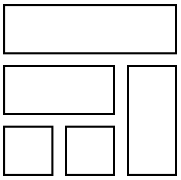


hist(X, bins, ...)
X, bins, range, density, weights

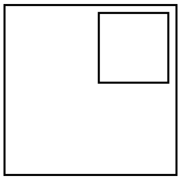
Subplots layout



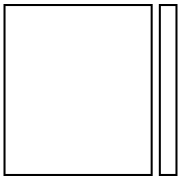
subplot[s](rows, cols, ...)
fig, ax = plt.subplot(3, 3)



G = **gridspec**(rows, cols, ...)
ax = G[0, :]



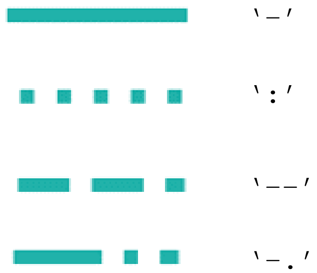
ax.**inset_axes**(extent)



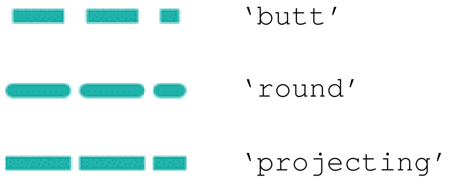
d = **make_axes_locatable**(ax)
ax = d.new_horizontal(‘10%’)

Lines

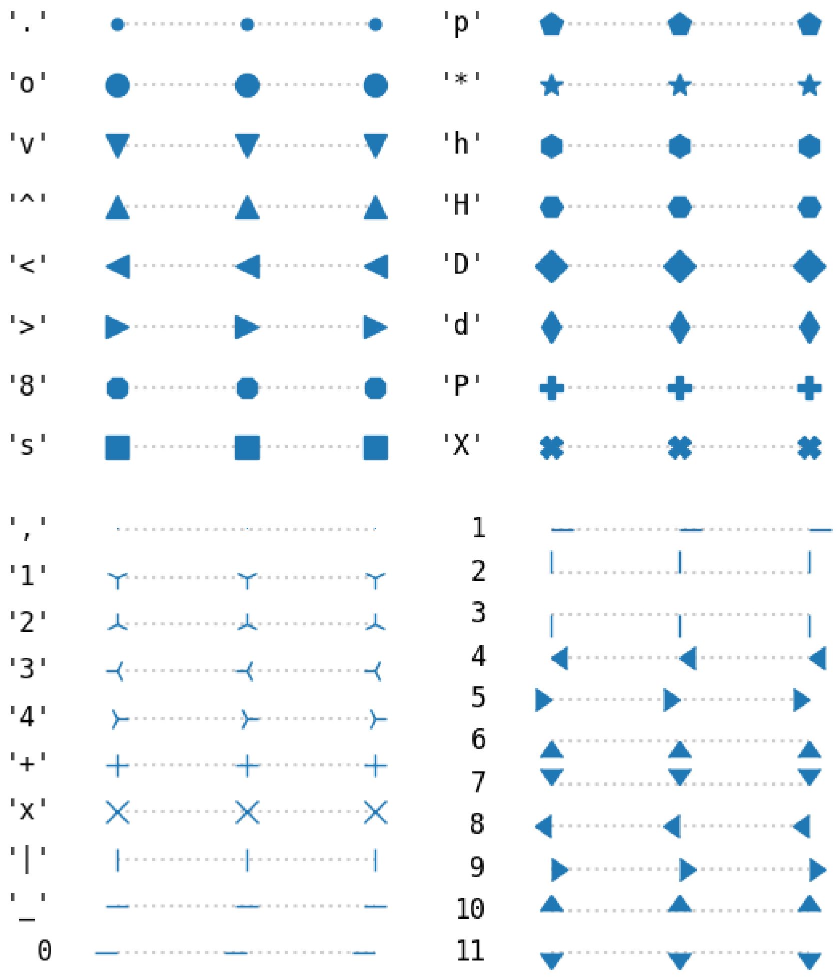
linestyle or ls



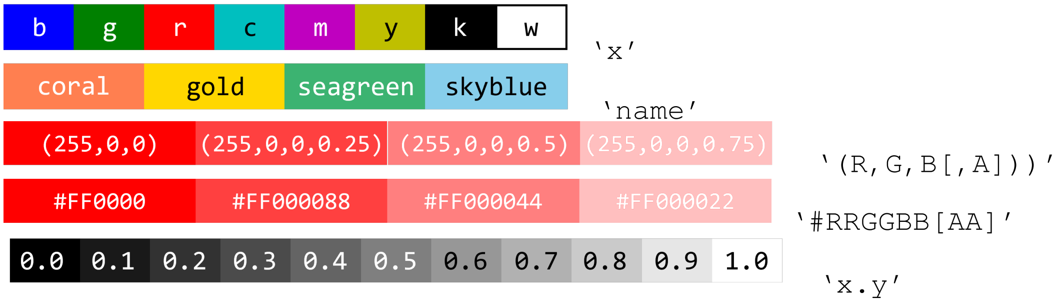
capstyle or dash_capstyle



Markers

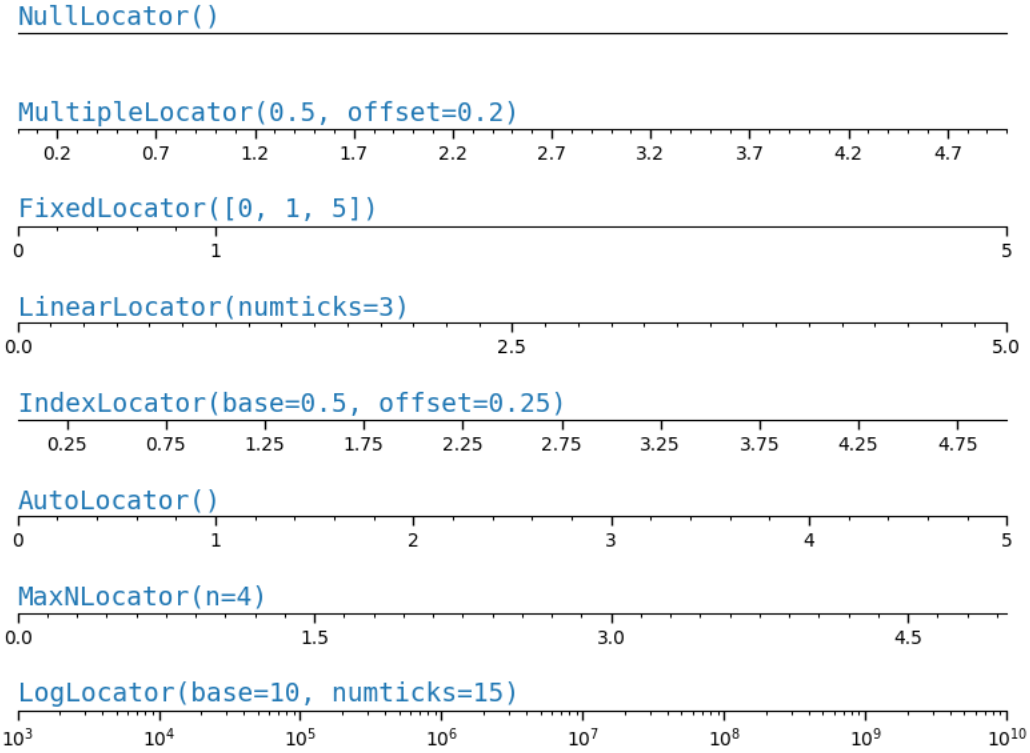


Colors



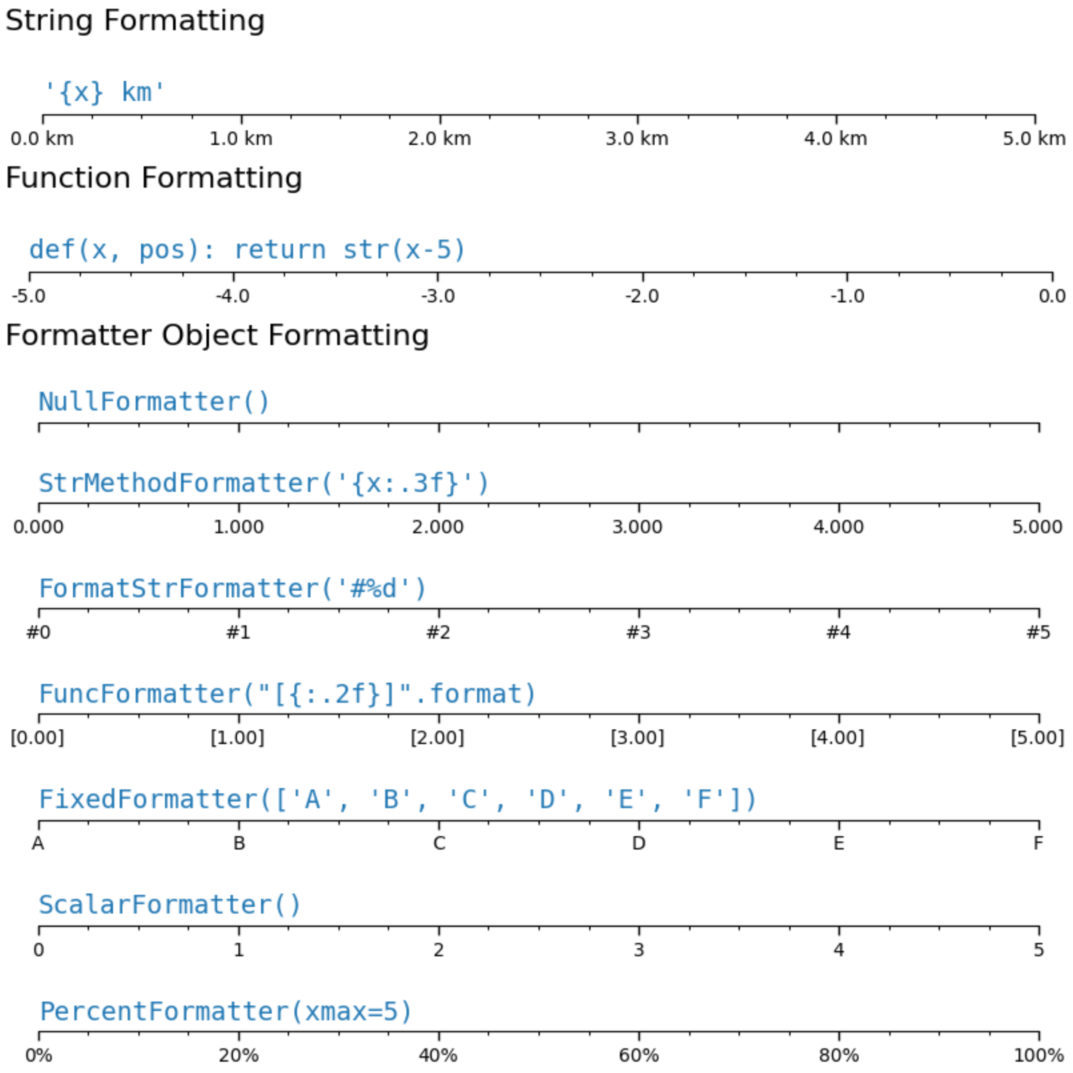
Tick locators

```
from matplotlib import ticker
ax.[xy]axis.set_[minor|major]_locator(ticker.locator)
```



Tick formatters

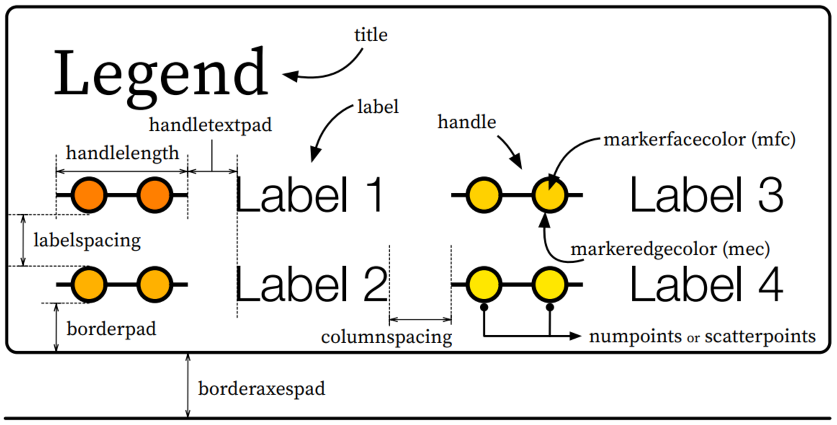
```
from matplotlib import ticker
ax.[xy]axis.set_[minor|major]_formatter(ticker.formatter)
```



Ornaments

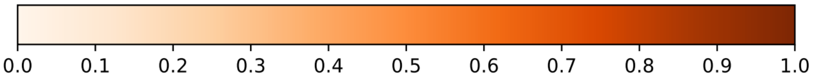
```
ax.legend(...)
```

handles, labels, loc, title, frameon



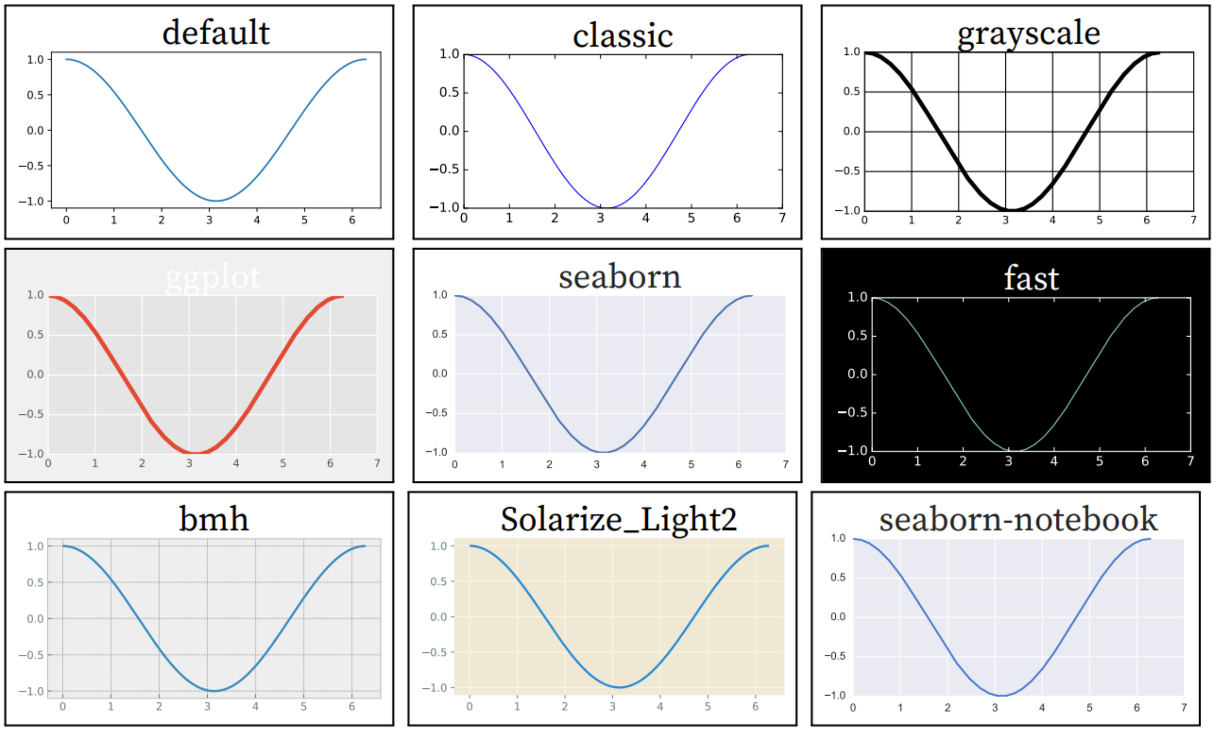
```
ax.colorbar(...)
```

mappable, ax, cax, orientation



Style

```
plt.style.use(style)
```



Quick reminder

```
ax.grid()
ax.set_[xy]lim(vmin, vmax)
ax.set_[xy]ticks(ticks, [labels])
ax.set_[xy]ticklabels(labels)
ax.set_title(title)
ax.tick_params(width=10, ...)
ax.set_axis_[on|off]()
fig.suptitle(title)
fig.tight_layout()
```

Ten simple rules

1. Know your audience

2. Identify your message

3. Adapt the figure

4. Captions are not optional

5. Do not trust the defaults

6. Use color effectively

7. Do not mislead the reader
8. Avoid “chartjunk”
9. Message trumps beauty
10. Get the right tool

Getting help

? matplotlib.org

? github.com/matplotlib/matplotlib/issues

? stackoverflow.com/questions/tagged/matplotlib

Adapted from: https://matplotlib.org/cheatsheets/