

Quick start

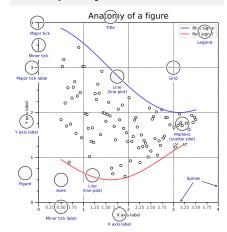
import numpy as np import matplotlib as mpl import matplotlib.pyplot as plt

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

fig, ax = plt.subplots() ax.plot(X,Y,color='C1')

fig.savefig("figure.pdf") fig.show()

Anatomy of a figure



Subplots layout

subplot[s](rows,cols,...) fig, axs = plt.subplots(3,3) G = gridspec(rows,cols,...) API ax = G[0,:]ax.inset_axes(extent) ax=d.new_horizontal('10%')

Getting help

matplotlib.org

O discourse.matplotlib.org

₩ gitter.im/matplotlib

Matplotlib users mailing list

Basic plots

API

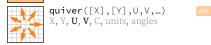


scatter(X,Y,...) X, Y, [s]izes, [c]olors, marker, cmap

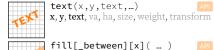












X, Y1, Y2, color, where

Advanced plots

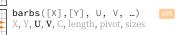
API





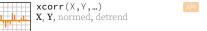












ax.set_[xy]scale(scale,...) MMMMMM linear log any values values > 0 symlog logit any values 0 < values < 1

Scales

Tick locators

ticker.NullLocator()

ticker.AutoLocator()

ticker.MaxNLocator(n=4)

Tick formatters

ticker.NullFormatter()

Ornaments

Legend ←

ax.colorbar(...)

Event handling

Label 1

Label 2

mappable, ax, cax, orientation

from matplotlib import ticker

ticker.FormatStrFormatter('>%d<')

from matplotlib import ticker

ticker.MultipleLocator(0.5)

ticker.FixedLocator([0, 1, 5])

ticker.LinearLocator(numticks=3)

ax.[xy]axis.set [minor|major] locator(locator)

0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0

ticker.IndexLocator(base=0.5, offset=0.25)

ticker.LogLocator(base=10, numticks=15)

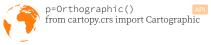
ax.[xy]axis.set_[minor|major]_formatter(formatter)

ticker.FuncFormatter(lambda x, pos: "[%.2f]" % x)

ticker.FixedFormatter(['', '0', '1', ...])

0.25 0.50 1 0.75 0.25 2 0.50 0.75 3 0.25 0.50 0.75

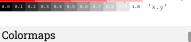










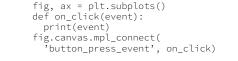


plt.get_cmap(name)

Cyclic







Animation

import matplotlib.animation as mpla

```
T = np.linspace(0,2*np.pi,100)
S = np.sin(T)
line, = plt.plot(T, S)
def animate(i):
  line.set_ydata(np.sin(T+i/50))
anim = mpla.FuncAnimation(
  plt.gcf(), animate, interval=5)
plt.show()
```

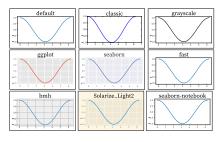
Styles

API

Label 3

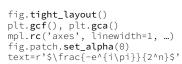
Label 4

plt.style.use(style)



Quick reminder

```
ax.grid()
ax.patch.set_alpha(0)
ax.set_[xy]lim(vmin, vmax)
ax.set_[xy]label(label)
ax.set_[xy]ticks(list)
ax.set_[xy]ticklabels(list)
ax.set_[sup]title(title)
ax.tick_params(width=10, ...)
ax.set_axis_[on|off]()
```



Keyboard shortcuts



f View forward

x X pan/zoom

g Minor grid 0/1

3. Adapt the Figure

4. Captions Are Not Optional



ctrl + s Save r Reset view

b View back

p Pan view

O Zoom to rect y Y pan/zoom

G Major grid 0/1

X axis log/linear L Y axis log/linear

Ten simple rules

1. Know Your Audience

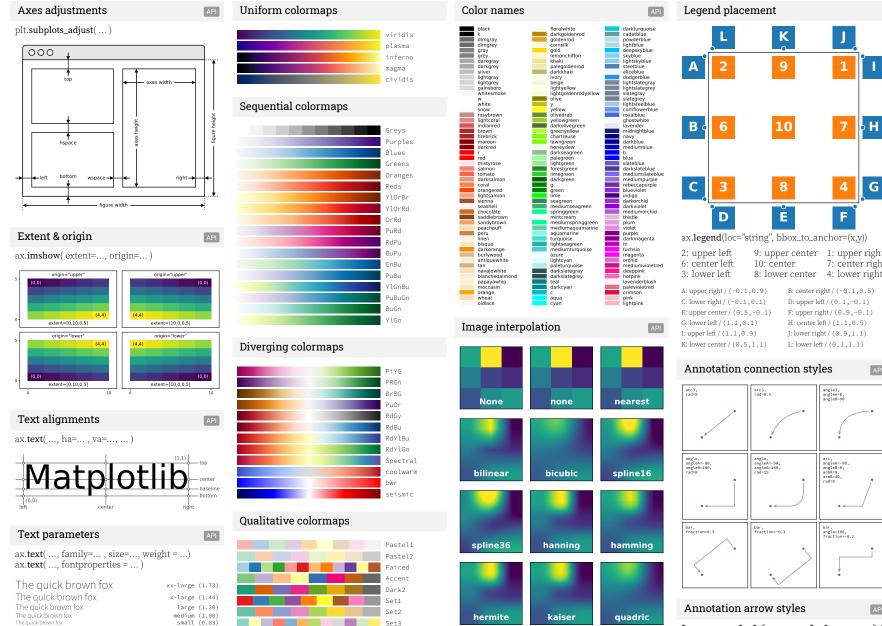
2. Identify Your Message

5. Do Not Trust the Defaults

6. Use Color Effectively

7. Do Not Mislead the Reader 8. Avoid "Chartiunk"

9. Message Trumps Beauty 10. Get the Right Tool



tab20

tab20b

cubehel is

rainbow

Miscellaneous colormaps

catrom

mitchell

gaussian

bessel

lanczos

x-small (0.69)

semibold (600)

ultralight (100)

normal (400)

serif

sans

italio

normal

normal

small-caps

black (900)

bold (700)

xx-small (0.58)

The quick brown fox jumps over the lazy dog

The quick brown fox jumps over the lazy dog The quick brown fox jumps over the lazy dog

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The quick brown fox jumps over the lazy dog

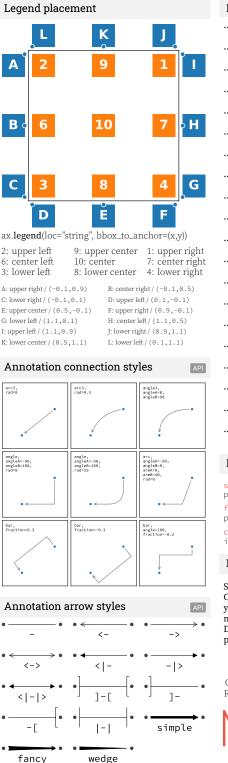
The quick brown fox jumps over the lazy dog

The quick brown fox jumps over the lazy dog

The quick brown fox jumps over the lazy dog monospace

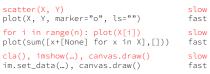
The quick brown fox jumps over the lazy dog

The quick brown fox jumps over the lazy dog





Performance tips



Beyond Matplotlib

Seaborn: Statistical Data Visualization Cartopy: Geospatial Data Processing yt: Volumetric data Visualization mpld3: Bringing Matplotlib to the browser Datashader: Large data processing pipeline plotnine: A Grammar of Graphics for Python

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