



Graphing with Matplotlib

Adam Kit
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Agenda

- What is matplotlib
- Figures vs Subplots
- 2D plots
- 3D Plots

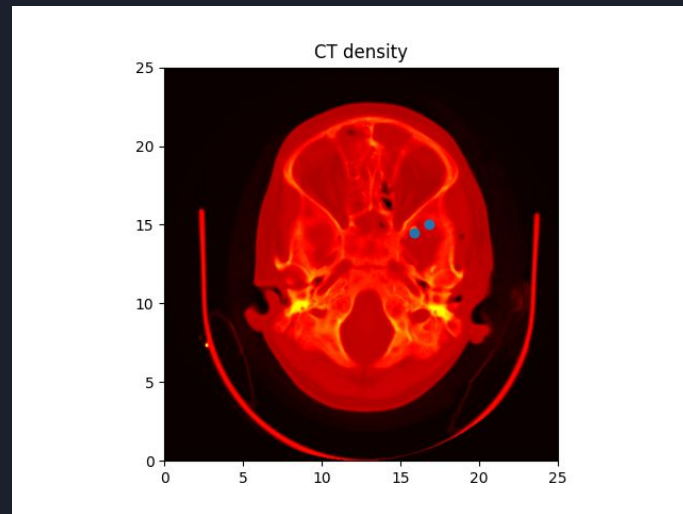
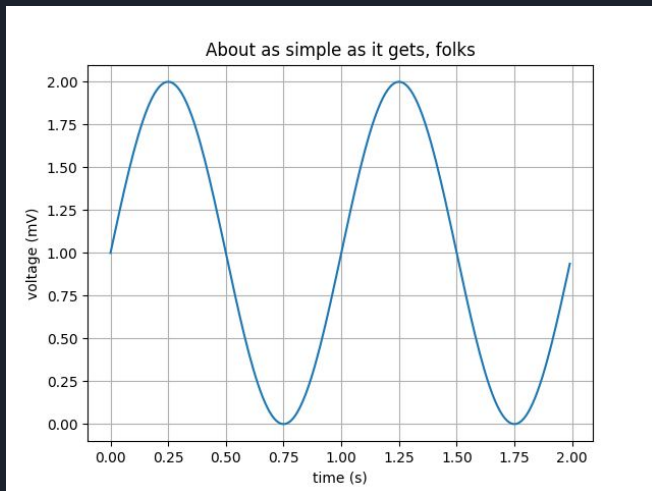
If you ever do not know how to use a certain function go to the documentation! I.e confused on subplots? [Here](#) is the function explained by the developers.

All graphs and code is taken directly from the Matplotlib website! Shoutout to them for doing an awesome job on documentation.



What is Matplotlib?

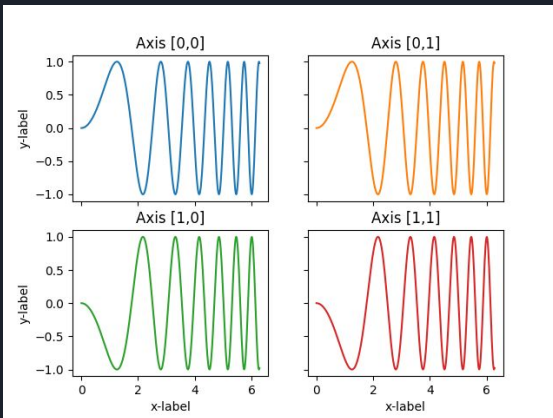
- [Matplotlib Website](#)
- Create data visualizations with functions or datasets
- Show images using `imshow()` (CT Scan)



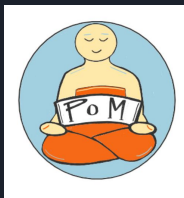


Figures vs Subplots

- [Demo from the Developers](#)
- A plot need not be predefined and can just be ran with `plt.plot(x,y)` and shown with `plt.show()`
- Use subplots to show multiple plots next to each other that may or may not share domain/ranges



```
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]')
```



2D Drawings

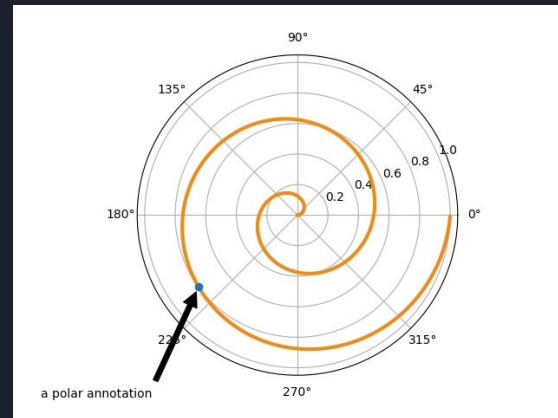
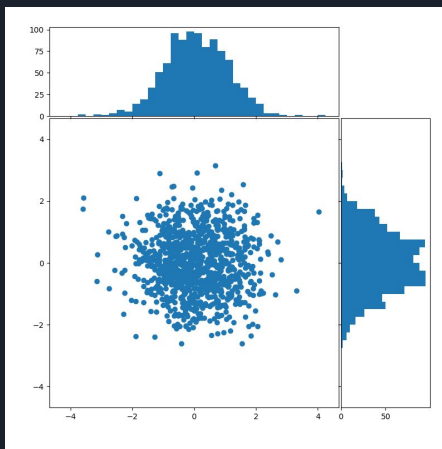
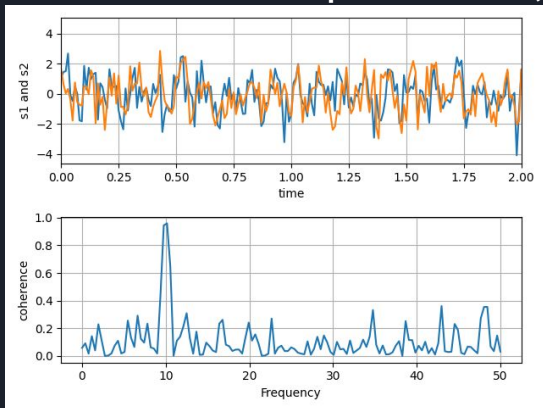
- Multiple Coordinate Possibilities (2d) i.e Cartesian, Polar
- Signal Plotting, Histograms, Scatter Plots

Cartesian: `plt.plot(x, y)`

Polar: `fig.add_subplot(Polar=True)`

Histogram: `plt.hist()`

Scatter: `plt.scatter()`





3D Drawings

- Showing 2d functions/objects in 3d
- Scatter Plots, Gradient Visualizations, Surfaces

