AggieSTAAR Python Bootcamp

Tutorial 2: matplotlib and plotting

TEXAS A&M UNIVERSITY

To-do:

Open up Jupyter lab through Anaconda, or by typing “jupyter lab” into a terminal, and open up tutorial3_plotting.ipynb.

To complete both exercises in the tutorial, you will need to have numpy and astropy installed, as well as rv2015.txt downloaded in the same folder as tutorial3_plotting.ipynb.

Plots

Plotting is a vital skill! What good is your data if you cannot present it?

It's good to learn how to use matplotlib as soon as possible - this is probably THE most important module in astronomy.

Most tutorials will start you with plt.plot(), but let's start with plt.subplots().

Subplots are far more flexible: we will see why soon.

Initializing your first plot

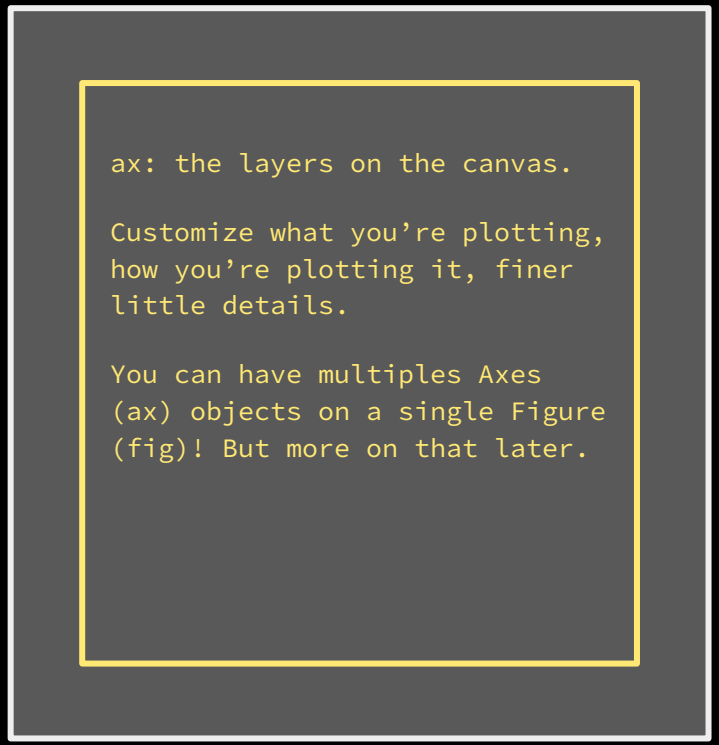
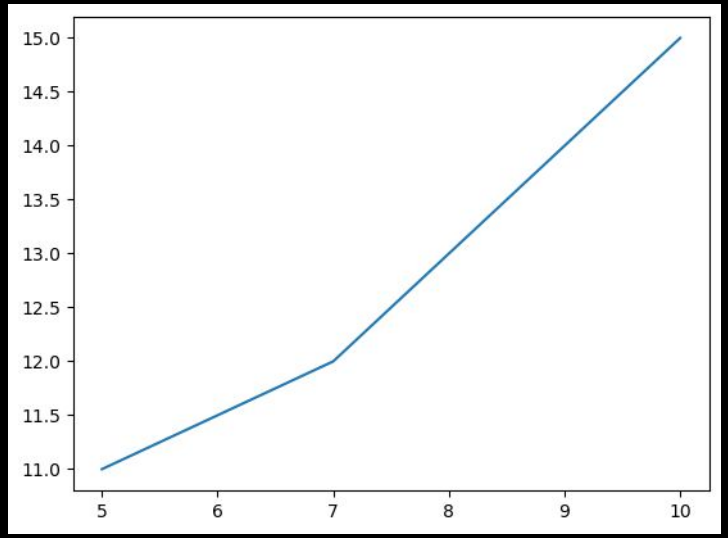


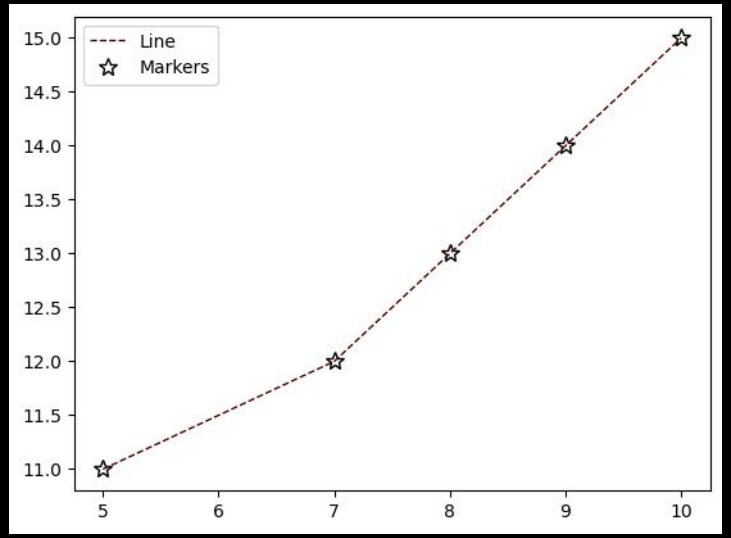
fig: the 'blank canvas'.

Control large-scale figure properties (saving figures) with fig.

kwargs

kwargs: short for keyword arguments. Lets you make your plots look really nice!





kwargs

kwargs: Learn to read and look through documentation!

matplotlib.axes.Axes.legend

Axes.legend(**args*, ***kwargs*) [source]

Place a legend on the Axes.

Example: documentation for plot legends. Lists of the different features you can customize, as well as instructions on how to customize them.

facecolor : *"inherit" or color, default:* `rcParams["legend.facecolor"]` *(default:* `'inherit'`*)*

The legend's background color. If `"inherit"`, use `rcParams["axes.facecolor"]` (default: `'white'`).

edgecolor : *"inherit" or color, default:* `rcParams["legend.edgecolor"]` *(default:* `'0.8'`*)*

The legend's background patch edge color. If `"inherit"`, use `rcParams["axes.edgecolor"]` (default: `'black'`).

mode : *{"expand", None}*

If *mode* is set to `"expand"` the legend will be horizontally expanded to fill the Axes area (or *bbox_to_anchor* if defines the legend's size).

bbox_transform : *None or* `Transform`

The transform for the bounding box (*bbox_to_anchor*). For a value of `None` (default) the Axes' `transAxes` transform will be used.

title : *str or None*

The legend's title. Default is no title (`None`).

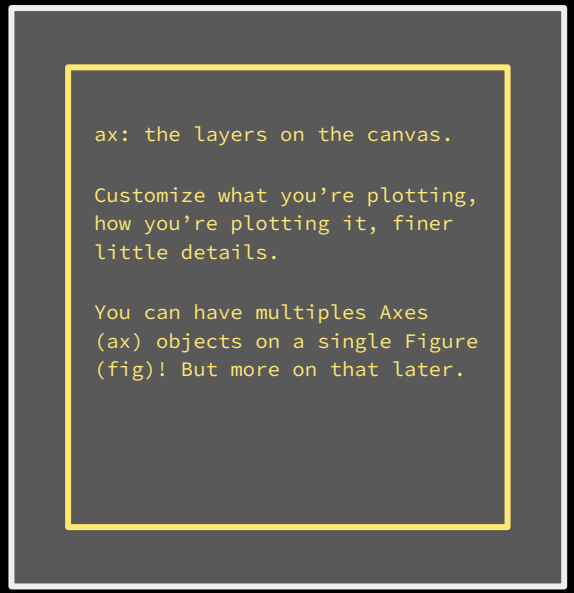
title_fontproperties : *None or* `FontProperties` *or dict*

The font properties of the legend's title. If None (default), the *title_fontsize* argument will be used if present; if *title_fontsize* is also None, the current `rcParams["legend.title_fontsize"]` (default: `None`) will be used.

Subplots

subplots: Interchangeable - you can plot one or many, so just use it for everything!

fig



fig