MATPLOTLIB

10.3.2018

OFFICE HOURS

* SLIGHT MODIFICATION: today 2:00-3:00 PM (not starting at 1:30 PM)

MATPLOTLIB

- **READ** PDSH Chapter 4: https://jakevdp.github.io/PythonDataScienceHandbook/04.00-introduction-to-matplotlib.html

MATPLOTLIB

* At the top of you python file / notebook:

    * %matplotlib inline
      from matplotlib import pyplot as plt

* The basic commands:

    * plt.plot

    * plt.hist

PLT.PLOT

* plots a line: plt.plot(x, y)

* control line & marker styles through the format string

XLIM / YLIM

* you can zoom in (or out) on some portion of your plot using **plt.xlim** and **plt.ylim**

* xlim(xmin, xmax) scales the x-axis so that the left edge is at xmin and right is at xmax

* similar for ylim

IMSHOW / MATSHOW

* turns a 2D array (matrix) into an image

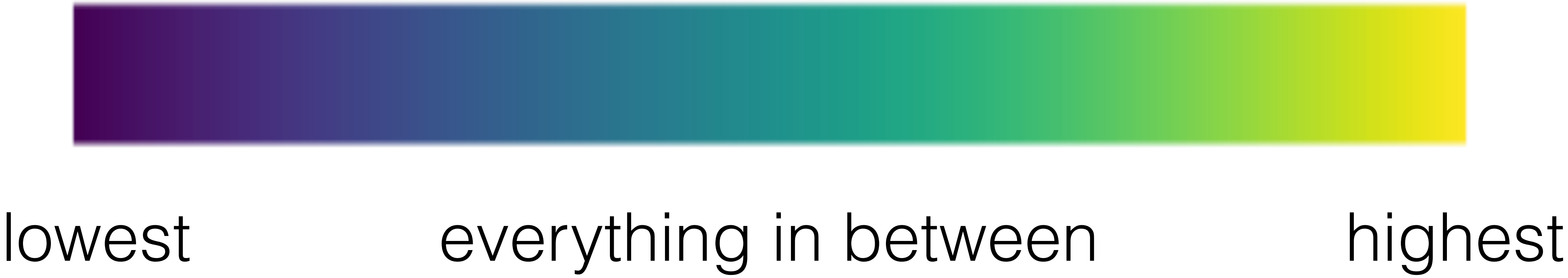
* matshow is a wrapper around imshow (i.e. matshow calls imshow internally) with some default values set (and, by default, it creates a new figure)

* imshow(arr)
  matshow(arr)

IMSHOW / MATSHOW

* imshow & matshow turn each value in the array into a color using a **colormap**

* by default, the smallest value in the array gets mapped to the “lowest” color, and the largest value gets mapped to the “highest” color

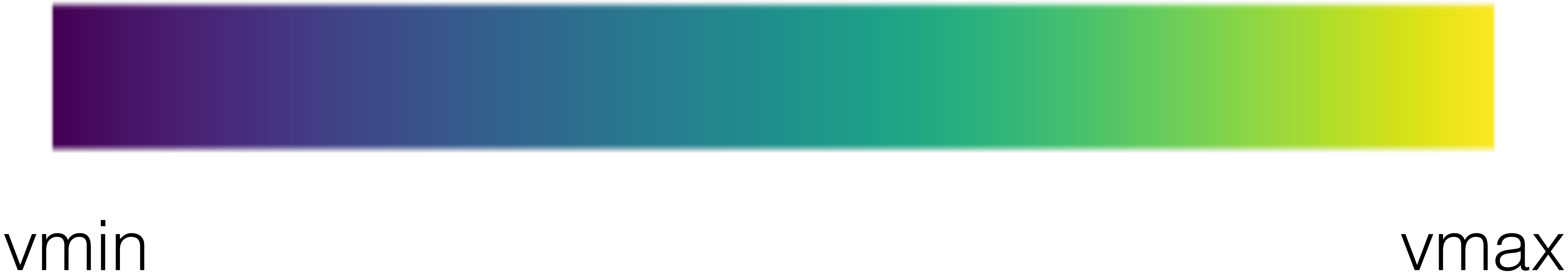


IMSHOW / MATSHOW

* you can control the color mapping using the **vmin** and **vmax** parameters to imshow/matshow

* vmin is the value that gets set to the “lowest” color (by default the smallest value in your array)

* similar for vmax



IMSHOW / MATSHOW

* there are many colormaps to choose from!

* they are listed in the plt.cm module

* you can change the colormap using the **cmap** argument to imshow/matshow

* to see all the matplotlib colormaps: https://matplotlib.org/examples/color/colormaps_reference.html

NP.SAVE / NP.LOAD

* save numpy ndarrays to disk (and load them) using the np.save (and np.load functions)

* np.save creates a **.npy** file

* e.g.

```
>>> np.save(‘some_filename.npy’, arr)
>>> arr2 = np.load(‘some_filename.npy’)
>>> np.allclose(arr, arr2)
True
```

END