

Computer Vision
Fall 2024
Skidmore College
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Goal: Learn the basics (and more) of numpy by following this page:

https://numpy.org/doc/stable/user/absolute_beginners.html

You may want to dedicate at least an hour or so and type the examples by hand into python interpreter.

You can run python3 at command line and type
import numpy as np
at the >>> prompt and you'll be good to go

OR

maybe better to run
jupyter notebook
then click new dropdown on top right and select Python3
and enter your code in a notebook which will be saved to Untitled.ipynb (or you can rename it)

Go through the following sections (and specifically pay attention to ***'d sections and feel free to SKIP the ones marked SKIP)

***Welcome to NumPy!
SKIP - Installing NumPy
How to import NumPy
Reading the example code
What's the difference between a Python list and a NumPy array?
What is an array?
More information about arrays
How to create a basic array
Adding, removing, and sorting elements
How do you know the shape and size of an array?
Can you reshape an array?
How to convert a 1D array into a 2D array (how to add a new axis to an array)
***Indexing and slicing
How to create an array from existing data
***Basic array operations
(take a side track to this <https://numpy.org/doc/stable/user/quickstart.html#quickstart-basic-operations> and look at the Basic Operations and Universal Functions sections)
***Broadcasting
***More useful array operations
***Creating matrices
SKIP - Generating random numbers

SKIP - How to get unique items and counts
***Transposing and reshaping a matrix
SKIP - How to reverse an array
***Reshaping and flattening multidimensional arrays
How to access the docstring for more information
(only the help, not the ? and ?? which is for Ipython)
***Working with mathematical formulas

You can look at these sections when you ever need them

How to save and load NumPy objects
Importing and exporting a CSV
Plotting arrays with Matplotlib

By the end of this you should know what the following things mean in relation to ndarrays (aka arrays) and a whole lot more:

axis
dtype

ndim
shape
size

ones
zeros
empty
arange
linspace

flatten
ravel

accessing elements with , separated indices inside [] for multidimensional arrays
use of : where an index goes inside []

You may want to also go through the quickstart page (a lot of repetition from the other page you went through) and pay close attention to "Copies and Views"
<https://numpy.org/doc/stable/user/quickstart.html#copies-and-views>

and "Functions and Methods Overview" section just below that one

Note: <https://numpy.org/doc/stable/user/index.html>
is the main page - the other links above are within this page.