

CSCI 127: Joy and Beauty of Data

Lecture 14: numpy

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Summer 2021

<https://reese.github.io/classes/summer2021/127/main.html>

Announcements

Lab 8 due **tonight** at 11:59 PM

Program 4 due **Sunday** at 11:59 PM

Remember to sign up for a 1 on 1 meeting if you haven't already

Program 4 help session **tomorrow** at 2:15 – 3:30 PM
via Zoom and **in person**

I will be hanging out in **Barnard 254** if you want to get help or chat about things

Today:
numpy



Important Announcement

Course evaluations are **OPEN**

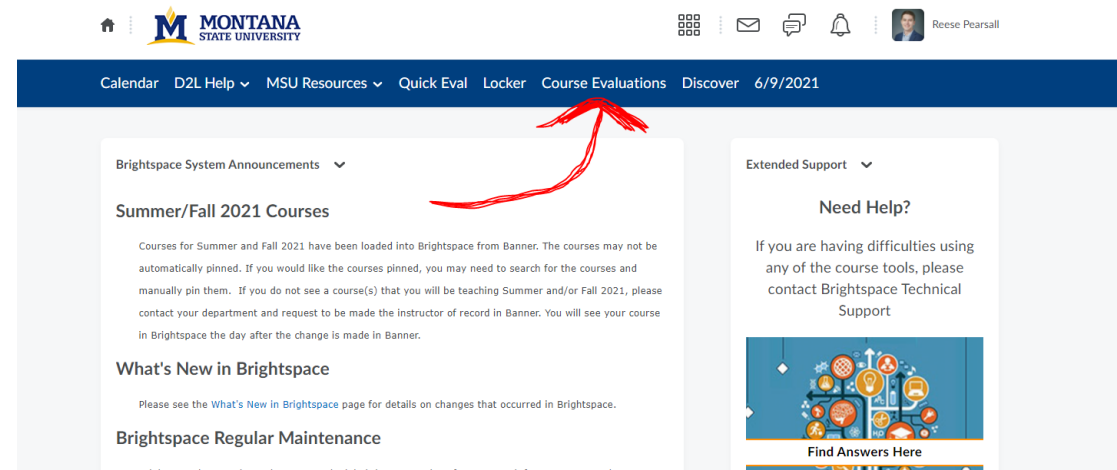
Because I am early in my teaching career,
your feedback is *very* important to me

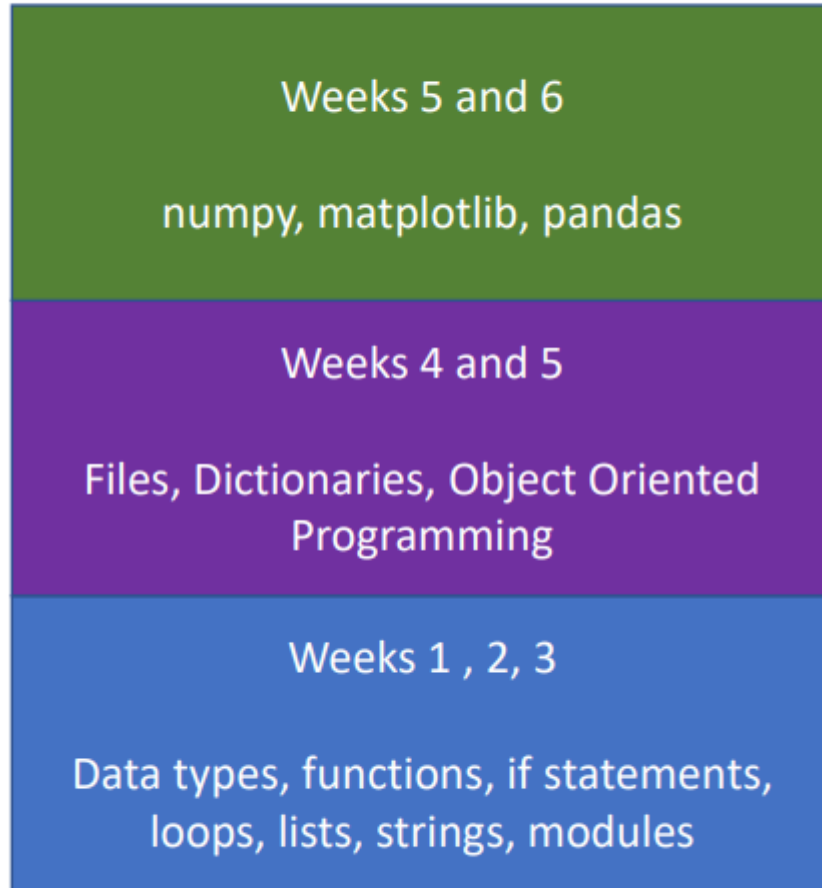
Your feedback will help make this
class better for future students

Your feedback will also be read by the
CS department head, who is in charge
of hiring instructors 😊

If you submit a screenshot showing you completed the
course evaluation, I will add 2% to your final exam grade

If 90% of the class or more fills out the evaluation, I
will add on another bonus of some kind





Data Science in Python

Advanced Python

Basics/Foundation of Python



Numpy Module

Numpy is a **module** that we can import into our programs

Numpy gives us access to a data structure called an **array**

- You can think of an array as a more efficient, but stricter implementation of a list

Numpy must be installed before you can use it:

Windows: **python -m pip install numpy**

Mac: **pip3 install --user numpy**

Arrays

An array is very similar to a list, but...

- Arrays are a fixed size

- Arrays can only contain one kind of data type

Arrays

Fixed Size

Can only have one data type

Accesses elements using indices

Can be sliced

Lists

Can continually increase/decrease size

Can mix and match data types

Accesses elements using indices

Can be sliced

Why use numpy arrays?

Numpy arrays are more **efficient**. Knowing the size of the data structure and what data type it will contain takes up less **space** and makes accessing elements in the data structure take less **time**

The numpy module also comes with many helpful functions for data analysis and scientific computations

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Numpy Example

Write a program that will compute the perimeter of some $M \times N$ numpy array

Write a program that will calculate the derivative of some N degree polynomial