Torzilli_PF5

Tuesday, October 17, 2017 7:10 AM

NENG 685 Fall 2017
PF 5 Due Oct. 17, 2017

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On Pre-flights:

- If you work with anyone else, document what you worked on together.
- If you are not using python, then substitute your language of choice when Python is specified.

Do not write in the table to the right.

Problem	Points	Score
1	10	
2	5	
3	5	
4	7	
5	4	
6	2	
7	12	
Total:	45	

1. (a) (2 points) How many columns and how many rows are created in the array with the command:
np.zeros((4,6))

4 rows and 6 columns

(b) (4 points) Name 4 ways to create an array with 2 columns and 3 rows. Bonus point if you can come up with a 5th way.

np.zeros((3,2))		Fills with 0s
np.ones((3,2))		Fills with 1s
np.empty((3,2))		Fills with 0s
np.array([[1,1][2,2][3,3]])		Creates based on input
np.full((3,2),7)		Fills with 7s

See Torzilli_PF5_arrays.py

(c) (3 points) Name 3 ways to automatically create an array/list containing the following numbers (without hard coding in the numbers):
[0, 2, 4, 6, 10, 12]

See Torzilli_PF5_arrays.py

(d) (1 point) How do I convert the following array to an array with 4 rows and 2 columns:
tmp1 = np.array([0, 2, 4, 6, 10, 12, 14 , 16])

See Torzilli_PF5_arrays.py

2. (a) (3 points) How does the dtype differ from standard python integers and floats in terms of memory management and precision?

dtypes have a constant size in memory
When using dtypes to create an array they automatically use the least precise dtype for the elements in question to determine what type of array it is. Additionally they have a default bit size for precision

(b) (2 points) What is the default dtype in an array of mixed types?

The least precise of the elements in the mix dictates which dtype is used. IE if the mix is integers and floating points then the dtype will be a float

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3. (a) (3 points) How would you return a slice of the array *tmp1* from Question #1d that goes from 0 to 16 counting by 4s and save it to a variable named tmp2?

See Torzilli_PF5_arrays.py

(b) (2 points) Now, if I set
tmp2[1]=0
What does tmp1 look like given the method chosen for part a?

By setting the 1 indexed value to 0 tmp2 looks like [0,0]

See Torzilli_PF5_arrays.py

4. (a) (3 points) In your own words, what are structured arrays?

Excel tables where the header line is the first value and each cell below it can be further subdivided. Doesn't seem to be worth the hassle currently in comparison to a dictionary.

(b) (4 points) Create a structured array to store 2 HW assignments, 3 preflights, and one project for 5 people.

See Torzilli_PF5_arrays.py

5. (4 points) Name two ways to add the following arrays together using *built-in* methods or functions:
x = np.array([1, 2]) y = np.array([3, 4])
What are some advantages/limitations of each approach used?

See Torzilli_PF5_arrays.py

See Torzilli_PF5_arrays.py

6. (2 points) In your own words what are Python ufuncs?

Recreated standard math functions like addition for the purpose of array operations

7. (a) (3 points) What is one concept that you found difficult in the reading?

Structured arrays. Why you would use them instead of dictionaries and how to actually get them to work with expected behavior.

(b) (3 points) What about the class structure works for you?

A clear assignment schedule with time in between to work on it. Working on problems during class

(c) (3 points) What about the class structure **does not** work for you?

The preflights are a bit time consuming and coupling them with homework for this class puts major time constraints. There were parts of the last homework that took to much time because the questions didn't seem clear what was expected like problem 2.

(d) (3 points) What is something we should be doing in class but aren't?

Programming equations used in other classes like the diffusion equation. I believe we are going to start on those concepts soon.