HW9-PART1 (30 POINTS)

These instructions are applicable for all scripts that you will write in python3.

```
Instructions for Python3 Homework submission

#class header

#Q1
var1=124

#Q2
var2=3+var1
```

```
HW9-part1 is due Sunday March 31st 11:59pm.

If you submit it by Saturday March 30th 11:59pm you will get 2 extra credit points
```

Policy: Work on the HW problems on your own. It is not allowed to share code in any way. The use of chatGPT is not allowed. Using the internet to find out how to solve problems is not allowed.

General Grading rules we will follow:

- We do not give points for instructions but take points off for not following them.
- We take all points off for a question if your code has syntax errors (comment out the code for partial credit).
- We grade the code, not the output of the code. Even if the output is correct, hard-cording, redundant logic, code that has no purpose in the program will not earn full credits.
- We will take points off if you use out-of-class material.
- We will take points off if you do not follow directions when a question specifies to use a certain command or write the code in a certain way.

HW9-part1 (30 points)

1. (30) In a script **ex9-ndarray.py** do the following:

Q1 (1) Import NumPy

Q2 (2) Create a 1D array of 1s, containing 5 elements. Use a NumPy function we did in class. Store it in a variable of your choice and print it to screen.

Q3 (2) Create a row vector of 0s, containing 5 elements. Use a NumPy function we did in class. Store it in a variable of your choice and print it to screen.

Q4 (2) Create a 1D array of numbers in range [20,23] with step size of 0.5. Use a NumPy function we did in class. Store it in a variable of your choice and print it to screen.

Q5 (2) Create a 1D array of 5 elements in range [20,23]. Use a NumPy function we did in class. Store it in a variable of your choice and print it to screen.

Q6 (2) Create a 1D array of 5 random numbers in range [0.0,1.0). Use a NumPy function we did in class. Store it in a variable and print it to screen.

Q7 (2) Slice the 1D array created in Q6, from 3rd element to the end, and print the selection to screen. Do not hardcode the end.

Q8 (2) Create a 1D array **idx** from list [0,1,3], and use it to index the 1D array created in Q6.

Q9 (2) Create a 2D array 5x6 called M of random integer numbers in range [1,100]. Use a NumPy function we did in class. Print M to screen.

Q10 (2) Store in variable r the second row of M and print r to screen.

Q11 (2) Store in variable c the last two columns of M and print c to screen.
Do not hardcode the end.

Q12 (3) Create 2 matrices of your choice and concatenate them vertically.
Store the concatenated matrices in variable C and print C to screen.
To create the two matrices, use two different NumPy functions we did in class.

Q13 (6) Print to screen the number of elements of C, its shape, and its dimension as reported below. Use attributes of a ndarray, 3 print functions, and concepts we did in part 1 of python. Do not hardcode any number. If you format the output, you will lose points on this part.

Here is an example of the output that you should obtain.
If your matrix C contains 4 rows and 5 columns, you should obtain this output.

```
The number of elements of C is 20
C is a 4x5 matrix
C is a 2D array
```

Upload to Gradescope HW9-part1:
ex9-ndarray.py