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4. Introduction to Numpy

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## 4. Introduction to Numpy

Here, we introduce Numpy, a mathematics framework for Python.

### Fundamentals of Numpy



## Video

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## Randomization

1.0/1 point (graded)

Write a function called `randomization` that takes as input a positive integer `n`, and returns `A`, a random  $n \times 1$  Numpy array.

**Available Functions:** You have access to the NumPy python library as `np`

**Grader note::** If the grader appears unresponsive and displays "Processing", it means (most likely) it has crashed. Please resubmit your answers, and leave a message in the forum and we will work on fixing it as soon as possible.

```
1 def randomization(n):
2     """
3     Arg:
4         n - an integer
5     Returns:
6         A - a randomly-generated nx1 Numpy array.
7     """
8     #Your code here
9     np.random.seed(0)
10    A = np.asarray(np.random.rand(n, 1))
11
12    return A
13
```

Press ESC then TAB or click outside of the code editor to exit

Correct

## Test results

**CORRECT**[See full output](#)[See full output](#)

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You have used 5 of 25 attempts

Here, we learn how to find dimensions and apply matrix multiplication using Numpy arrays.

## Matrix Properties and Operations



### Video

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## Operations

1.0/1 point (graded)

Write a function called `operations` that takes as input two positive integers `h`

and `w`, makes two random matrices `A` and `B`, of size `h x w`, and returns `A`, `B`, and `s`, the sum of `A` and `B`.

**Available Functions:** You have access to the NumPy python library as `np`

**Grader note::** If the grader appears unresponsive and displays "Processing", it means (most likely) it has crashed. Please resubmit your answers, and leave a message in the forum and we will work on fixing it as soon as possible.

```
1 def operations(h, w):
2     """
3     Takes two inputs, h and w, and makes two Numpy arrays A and B of size
4     h x w, and returns A, B, and s, the sum of A and B.
5
6     Arg:
7         h - an integer describing the height of A and B
8         w - an integer describing the width of A and B
9     Returns (in this order):
10        A - a randomly-generated h x w Numpy array.
11        B - a randomly-generated h x w Numpy array.
12        s - the sum of A and B.
13    """
14    #Your code here
15    A = np.random.rand(h, w)
```

Press ESC then TAB or click outside of the code editor to exit

Correct

## Test results

**CORRECT**

[See full output](#)

[See full output](#)

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You have used 1 of 25 attempts

---

Here, we learn how to find the maximum and minimum values in a Numpy array

and obtain the norm of a vector.

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## Max, Min, and Norm



### Video

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## Norm

1.0/1 point (graded)

Write a function called `norm` that takes as input two Numpy column arrays `A` and `B`, adds them, and returns `s`, the L2 norm of their sum.

**Available Functions:** You have access to the NumPy python library as `np`

**Grader note::** If the grader appears unresponsive and displays "Processing", it means (most likely) it has crashed. Please resubmit your answers, and leave a message in the forum and we will work on fixing it as soon as possible.

```
def norm(A, B):  
    """
```

```
3 Takes two Numpy column arrays, A and B, and returns the L2 norm of
4 sum.
5
6 Arg:
7     A - a Numpy array
8     B - a Numpy array
9 Returns:
10    s - the L2 norm of A+B.
11    """
12    #Your code here
13    s = np.linalg.norm(np.add(A, B))
14
15    return s
```

Press ESC then TAB or click outside of the code editor to exit

Correct

## Test results

**CORRECT**

[See full output](#)

[See full output](#)

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## Discussion

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### [Grader Issue](#)

[Hi all, Our engineering team just added more resources to support the auto grader. If you ar...](#)

27

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?	<u>Question for Q2 - ValueError: too many values to unpack (expected 3)</u> Hi, I got an ValueError: too many values to unpack(expected 3) for the code below: if h>0 and t...	3
💬	<u>Marked me incorrect even though I was right</u> I was adding extra function to print out A+B and also the norm of A+B, but it marked me inco...	2
?	<u>@TA --- TypeError: iteration over a 0-d array</u> Hi TA and Staff What does this error mean? Getting it on all my codes. Works in PyCharm tho...	4
?	<u>Question3 got stuck....</u> Really got stuck here. Don't know what needs to be fixed. please advise. <code>''' def norm(A, B): '''</code> ...	5
💬	<u>Strict grader</u> Hey, I went and wrote "pretty" code for exercise 1, got it wrong (even though it was working o...	4
?	<u>I don't know how is this not right for Q1 &amp; Q2</u> I am pretty sure I understand the concept. And while I practice in my own Python3.6, it works...	6
💬	<u>Correct answer for "Randomization" but it says incorrect... WHY?</u> there are many ways to write the code. In my conda I got the answer you asked for, and whe...	4
💬	<u>[Grading Issue] Unsubmitted</u> I tried submitting my code a few times and it still goes back to having it unanswered.	1
💬	<u>Tired of being stick on these issues</u> Mr Staff, I dont know we paid the course fee for your IT problems or to learn something or to...	3
?	<u>Error in question 2</u> Why am I getting an error with this answer <code>def operations(h, w): A = np.random.random([3,5])...</code>	2
?	<u>My correct submission for Q1 isnt getting a correct massage... please help.</u> For Q1 Randomization, why below code is incorrect? There are many ways to answer your qu...	2

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