

Creation in NumPy

This lesson helps you learn how to create a NumPy array in different ways.

We'll cover the following

- Create an Array of Zeros
- Create an Array of Ones
- Create an Array of 0's and 1's
- Create an Array of 2's
- Create a NumPy Array of any Length
- Reshape a NumPy Array into a Column Vector
- Generate Array of Random Numbers and in Grid Format
- Create a Linspace
- Create a Mesh Grid

For using numpy, import the numpy library.

```
import numpy
```

Create an Array of Zeros

To create a numpy array containing zeros, write: `np.zeros(size)`

To create an array of size 9 write: `np.zeros(9)`

Here is how this array is stored in memory:

```
z [ 0  0  0  0  0  0  0  0  0]
```

```
1 import numpy as np
2 Z=np.zeros(9)
3 print(Z)
```



Create an Array of Ones

To create a numpy array containing ones, write: `np.ones(size)`.

To create an array of size 9 write: `np.ones(9)`

Here is how this array is stored in memory:

Z

1	1	1	1	1	1	1	1	1
---	---	---	---	---	---	---	---	---

```
import numpy as np
Z = np.ones(9)
print(Z)
```



Create an Array of 0's and 1's

To create an array of zeros and ones, use `np.array([1,0,0,0,0,0,0,1,0])`:

Here is how the array is stored in memory:

Z

1	0	0	0	0	0	0	1	0
---	---	---	---	---	---	---	---	---

```
import numpy as np
Z = np.array([1,0,0,0,0,0,0,1,0])
print(Z)
```



Create an Array of 2's

To create an array of 2's write: `2*np.ones(size)` .

To create an array of 2's of size 9 write: `2*np.ones(9)` .

Here is how the array is stored in memory:

Z

2	2	2	2	2	2	2	2	2
---	---	---	---	---	---	---	---	---

```
import numpy as np
Z = 2*np.ones(9)
print(Z)
```



Create a NumPy Array of any Length

To create an array of any length write: `np.arange(size)` .

To create an array of size 9 write : `np.arange(9)` .

Here is how the array is stored in memory:

Z

0	1	2	3	4	5	6	7	8
---	---	---	---	---	---	---	---	---

```
import numpy as np
Z = np.arange(9)
print(Z)
```



Reshape a NumPy Array into a Column Vector

To reshape a numpy array,write: `np.arange(size).reshape(size,1)` .

To reshape a numpy array into 9 rows and 1 column ,write:

`np.arange(9).reshape(9,1)` .

Here is how the array is stored in memory:



```
import numpy as np
Z = np.arange(9).reshape(9,1)
print(Z)
```

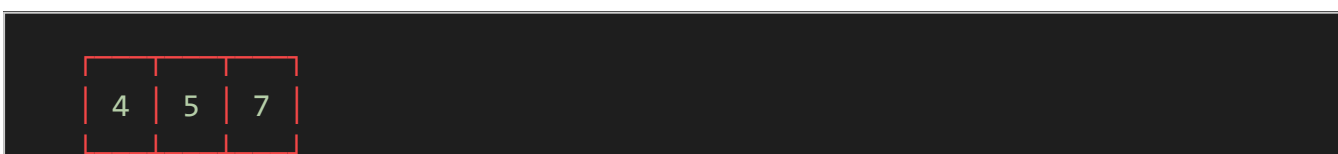


Generate Array of Random Numbers and in Grid Format

To generate an array of random size, write: `np.random.randint(0,size,(x_dimension,y_dimension))`.

To generate an array of random numbers from 0 to 9 and x dimension 3 and y dimension 3, write: `np.random.randint(0,9,(3,3))`.

Here is how the array is stored in memory:



Z	0	2	6
	8	4	0

```
import numpy as np
Z=np.random.randint(0,9,(3,3))
print(Z)
```



Create a Linspace

To create evenly spaced numbers over a specified interval write :

```
np.linspace(start, stop, size)
```

To create a linspace of range 0-1 and size 5 , write : `Z = np.linspace(0, 1, 5)`.

Here is how it is stored in memory:

Z	0.00	0.25	0.50	0.75	1.00
---	------	------	------	------	------

```
import numpy as np
Z = np.linspace(0, 1, 5)
print(Z)
```



Create a Mesh Grid

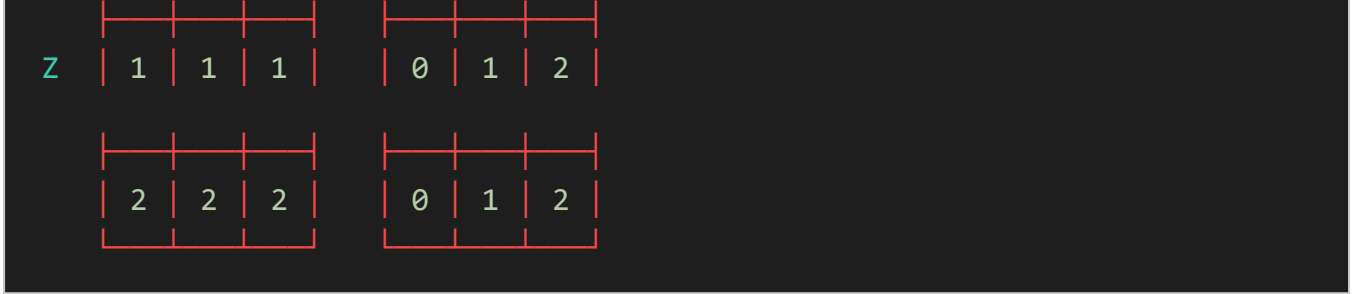
To create a dense multi-dimensional “meshgrid”. ,write:

```
np.mgrid[0:x_dimension,0:y_dimenion]
```

To create a grid in numpy of size(3*3),write: `np.mgrid[0:3,0:3]`

Here is how a mesh grid is stored in memory:

0	0	0	0	1	2
---	---	---	---	---	---



```
import numpy as np
Z=np.mgrid[0:3,0:3]
print(Z)
```



Solve this Quiz!

1

How would you create a null vector of size 10?



A)

```
import numpy as np
np.zeros(10)
```



B)

```
import numpy as np
np.ones(10)
```

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Now that we have learned to create a NumPy, let's move on to the next lesson "Reshaping in NumPy".