From Python to Numpy
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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:

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

RUN SAVE RESET

Output 0.9101s

```
[0. 0. 0. 0. 0. 0. 0. 0. 0.]
```

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:

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

RUN SAVE RESET

Output 0.3661s

```
[1. 1. 1. 1. 1. 1. 1. 1. 1.]
```

Create an Array of 0's and 1's

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

Here is how the array is stored in memory:

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

RUN SAVE RESET

Output 1.341s

```
[1 0 0 0 0 0 1 0]
```

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:

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

RUN SAVE RESET

Output 0.3971s

```
[2. 2. 2. 2. 2. 2. 2. 2. 2.]
```

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:

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

RUN SAVE RESET

Output 0.4991s

```
[0 1 2 3 4 5 6 7 8]
```

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 is stored in memory:

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

RUN SAVE RESET

Output 0.8861s

```
[[0]
 [1]
 [2]
 [3]
 [4]
 [5]
 [6]
 [7]
 [8]]
```

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:

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

RUN SAVE RESET

Output 0.6771s

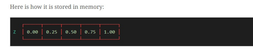
```
[[4 5 7]
 [3 0 2]
 [2 8 0]]
```

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:




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

RUN SAVE RESET

Output 0.8661s

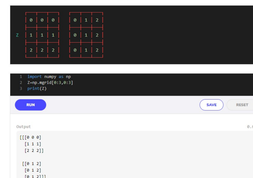
```
[0.  0.25 0.5  0.75 1.  ]
```

Create a Mesh Grid

To create a dense multi-dimensional "meshgrid" , write: `np.mgrid[0:x_dimension,0:y_dimension]`

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:




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

RUN SAVE RESET

Output 0.6161s

```
[[[0 0 0]
  [1 1 1]
  [2 2 2]]

 [[0 1 2]
  [0 1 2]
  [0 1 2]]]
```

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".

Mark as Completed

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