

SUMESH R - 20104169

```
In [1]: import numpy as np
```

1. Create an array with zeros and ones

```
In [2]: print(np.zeros(5, dtype="int64"))  
[0 0 0 0 0]
```

```
In [3]: print(np.ones(5, dtype="int64"))  
[1 1 1 1 1]
```

2. Create an array and print the output

```
In [4]: arr = np.array([1,2,3,4,5,6])  
print(arr)  
[1 2 3 4 5 6]
```

3. Create an array whose initial content is random and print the output

```
In [5]: arr3 = np.empty(5)  
print(arr3)  
[5.e-324 5.e-324 5.e-324 5.e-324 5.e-324]
```

4. Create an array with the range of values with even intervals

```
In [6]: arr4 = np.arange(0,11,2)  
print(arr4)  
[ 0  2  4  6  8 10]
```

5. Create an array with values that are spaced linearly in a specified interval

```
In [7]: arr5 = np.linspace(1,10,num=3, dtype="int64")  
print(arr5)
```

```
[ 1  5 10]
```

6. Access and manipulate elements in the array

```
In [8]: arr=np.array([1,2,3,4,5,6,7,8,9])
arr[2]=5
print(arr)
```

```
[1 2 5 4 5 6 7 8 9]
```

7. Create a 2-dimensional array and check the shape of the array

```
In [9]: arr7=np.array([[1,2,3,4,5],[6,7,8,9,10]])
print(np.shape(arr7))
```

```
(2, 5)
```

8. Using the arange() and linspace() function to evenly space values in a specified interval

```
In [10]: arr8 = np.arange(1,11)
print(arr8)
```

```
[ 1  2  3  4  5  6  7  8  9 10]
```

```
In [11]: arr8 = np.linspace(1,11,5, dtype="int64")
print(arr8)
```

```
[ 1  3  6  8 11]
```

9. Create an array of random values between 0 and 1 in a given shape

```
In [12]: arr9 = np.random.rand(3,3)
print(arr9)
```

```
[[0.68920427 0.39349163 0.50839864]
 [0.73104359 0.52490794 0.46771216]
 [0.49958287 0.76047829 0.60457896]]
```

10. Repeat each element of an array by a specified number of times using repeat() and tile() functions

```
In [13]: arr10 = np.array([1,2,3,4,5])  
         print(np.repeat(arr10,2))
```

```
[1 1 2 2 3 3 4 4 5 5]
```

```
In [14]: arr10 = np.array([1,2,3,4,5])  
         print(np.tile(arr10,2))
```

```
[1 2 3 4 5 1 2 3 4 5]
```

11. How do you know the shape and size of an array?

```
In [15]: arr11=np.array([[1,2,3],[4,5,6]])  
         print(np.shape(arr11))
```

```
(2, 3)
```

```
In [16]: arr11=np.array([[1,2,3],[4,5,6]])  
         print(np.size(arr11))
```

```
6
```

12. Create an array that indicates the total number of elements in an array

```
In [17]: arr12=np.array([[1,2,3,4,5,6]])  
         print(np.size(arr12))
```

```
6
```

13. To find the number of dimensions of the array

```
In [18]: arr13=np.array([[1,2],[3,4]])  
         print(np.ndim(arr13))
```

```
2
```

14. Create an array and reshape into a new array

```
In [19]: arr14 = np.array([[1,2,3],[4,5,6]])  
         a=arr14.reshape(3,2)  
         print(a)
```

```
[[1 2]
 [3 4]
 [5 6]]
```

15. Create a null array of size 10

```
In [20]: arr15=np.zeros(15, dtype="int64")
         print(arr15)
```

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

16. Create any array with values ranging from 10 to 49 and print the numbers whose remainders are zero when divided by 7

```
In [21]: arr16 = np.arange(10,50)
         print(arr16[arr16%7==0])
```

```
[14 21 28 35 42 49]
```

17. Create an array and check any two conditions and print the output

```
In [22]: arr17 = np.array([1,2,3,4,5,6,7,8,9])
         print(arr17[(arr17>3)&(arr17<8)])
```

```
[4 5 6 7]
```

18. Use Arithmetic operator and print the output using array

```
In [23]: a=np.array([1,2,3,4,5])
         b=np.array([2,2,2,2,2])
         print(a+b)
```

```
[3 4 5 6 7]
```

```
In [24]: print(a-b)
```

```
[-1  0  1  2  3]
```

```
In [25]: print(a*b)
```

```
[ 2  4  6  8 10]
```

```
In [26]: print(a/b)
```

```
[0.5 1.  1.5 2.  2.5]
```

19. Use Relational operators and print the results using array

In [27]:

```
a=np.array([1,2,3,4,5])  
b=np.array([2,2,2,2,2])  
print(a>b)
```

```
[False False  True  True  True]
```

In [28]:

```
print(a<b)
```

```
[ True False False False False]
```

In [29]:

```
print(a<=b)
```

```
[ True  True False False False]
```

In [30]:

```
print(a>=b)
```

```
[False  True  True  True  True]
```

In [31]:

```
print(a==b)
```

```
[False  True False False False]
```

In [32]:

```
print(a!=b)
```

```
[ True False  True  True  True]
```

20. Difference between python and ipython

A general-purpose programming language is Python. Guido van Rossum developed it. It is currently one of the most widely used languages worldwide. Python is widely used by scientists because of libraries like NumPy, SciPy, pandas, and matplotlib.

IPython is a Python interactive command line terminal. IPython provides a read-eval-print loop (REPL) environment that has been upgraded and is especially well suited for scientific computing.