

D2-20/07/2023\_Numpy

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

1.Create an array with zeros and ones

```
In [2]: a=np.zeros(3,dtype=np.int64)
b=np.ones(3,dtype=np.int64)
print(a)
print(b)
```

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

2.Create an array and print the output

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

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

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

```
In [4]: print(np.empty(3))
```

```
[1.29061685e-306 2.44763557e-307 1.69119330e-306]
```

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

```
In [5]: d=np.arange(2,11,+2)
print(d)
```

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

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

```
In [6]: print(np.linspace(1,50,num=20,dtype=np.int64))
```

```
[ 1  3  6  8 11 13 16 19 21 24 26 29 31 34 37 39 42 44 47 50]
```

6.Acess and manipulate elements in the array

```
In [7]: arr=np.array([10,20,30,40,50])
print(arr)
```

```
[10 20 30 40 50]
```

```
In [8]: arr[0]
```

```
Out[8]: 10
```

```
In [9]: arr[0:4]
```

```
Out[9]: array([10, 20, 30, 40])
```

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

```
In [10]: a=np.array([[1,2,3],[4,5,6]])  
print(a)
```

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

```
In [11]: print(np.shape(a))
```

```
(2, 3)
```

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

```
In [12]: arr=np.arange(1,11,+2)  
print(arr)
```

```
[1 3 5 7 9]
```

```
In [13]: print(np.linspace(1,10,num=5))
```

```
[ 1.    3.25  5.5   7.75 10.   ]
```

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

```
In [14]: x=np.array([1,0,0,1,0,1])  
b=a.reshape(2,3)  
print(b)
```

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

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

```
In [15]: print(np.repeat(arr ,3))
```

```
[1 1 1 3 3 3 5 5 5 7 7 7 9 9 9]
```

```
In [16]: print(np.tile(arr ,3))
```

```
[1 3 5 7 9 1 3 5 7 9 1 3 5 7 9]
```

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

```
In [17]: arr=np.array([10,20,30,40,50])  
print (np.shape(arr))
```

```
(5,)
```

```
In [18]: print(np.size(arr))
```

```
5
```

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

```
In [19]: arr=np.array([10,20,30,40,50])  
arr1=np.array([np.size(arr)])  
print(arr1)
```

```
[5]
```

13.To find the number of dimensions of the array

```
In [20]: print(np.ndim(b))
```

```
2
```

14.Create an array and reshape into a new array

```
In [21]: a=np.array([1,0,6,8,44,12])  
b=a.reshape(2,3)  
print(b)
```

```
[[ 1  0  6]  
 [ 8 44 12]]
```

15.create a null array of size 10

```
In [23]: print(np.zeros(10,dtype=np.int64))
```

```
[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 [24]: arr=np.arange(10,50)  
print(arr)
```

```
[10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33  
 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49]
```

```
In [26]: arr1=arr[arr%7==0]
print(arr1)
```

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

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

```
In [27]: a=arr[(arr>20)&(arr<30)]
print(a)
```

```
[21 28]
```

18. Use Arithmetic operator and print the output using array

```
In [28]: a=np.array([10,20,30])
b=np.array([50,60,70])
print(a+b)
print(a-b)
print(a*b)
print(a/b)
```

```
[ 60  80 100]
[-40 -40 -40]
[ 500 1200 2100]
[0.2      0.33333333 0.42857143]
```

19. Use Relational operators and print the results using array

```
In [29]: a=np.array([10,20,30])
print(a[a>20])
print(a[a<20])
print(a[a>=20])
print(a[a<=20])
```

```
[30]
[10]
[20 30]
[10 20]
```

20. Difference between python and ipython"

ipython is interactive shell of python ipython - interactive command-line terminal of python  
ipython has many features than python ipython is effective in testing, debugging it has tab-mechanism it has read-eval-print loop (REPL) the ipython reads the input and gives the result back to the user.

In [ ]: