

▼ 3D ARRAY

```
import numpy as np
a=np.array([[[0,1,2,3],[4,5,6,7],[8,9,10,11]]])
a
```

```
array([[[ 0,  1,  2,  3],
        [ 4,  5,  6,  7],
        [ 8,  9, 10, 11]]])
```

```
a.shape
```

```
(1, 3, 4)
```

```
len(a)
```

```
1
```

```
a.ndim
```

```
3
```

```
a.size
```

```
12
```

```
a.dtype
```

```
dtype('int64')
```

▼ creating array of zero

```
b=np.zeros(6)
```

```
b
```

```
array([0., 0., 0., 0., 0., 0.])
```

▼ creating array of one

```
c=np.ones(6)
```

```
c
```

```
array([1., 1., 1., 1., 1., 1.])
```

```
d=np.arange(10,20,2)
```

```
d
```

```
array([10, 12, 14, 16, 18])
```

```
e=np.linspace(0,10,4)
```

```
e
```

```
array([ 0.          ,  3.33333333,  6.66666667, 10.          ])
```

▼ arithmetic operation

▼ addition

```

a=np.array([[0,1,2,3],[4,5,6,7],[8,9,10,11]])
a1=np.array([[12,13,14,15],[16,17,18,19],[20,21,22,23]])
a+a1

array([[12, 14, 16, 18],
       [20, 22, 24, 26],
       [28, 30, 32, 34]])

```

▼ subtraction

```

a-a1

array([[ -12,  -12,  -12,  -12],
       [ -12,  -12,  -12,  -12],
       [ -12,  -12,  -12,  -12]])

```

▼ multiplication

```

a*a1

array([[  0,  13,  28,  45],
       [ 64,  85, 108, 133],
       [160, 189, 220, 253]])

```

▼ division

```

a/a1

array([[0.         , 0.07692308, 0.14285714, 0.2         ],
       [0.25        , 0.29411765, 0.33333333, 0.36842105],
       [0.4         , 0.42857143, 0.45454545, 0.47826087]])

```

```

np.exp(a)

array([[1.00000000e+00, 2.71828183e+00, 7.38905610e+00, 2.00855369e+01],
       [5.45981500e+01, 1.48413159e+02, 4.03428793e+02, 1.09663316e+03],
       [2.98095799e+03, 8.10308393e+03, 2.20264658e+04, 5.98741417e+04]])

```

```

np.sqrt(a1)

array([[3.46410162, 3.60555128, 3.74165739, 3.87298335],
       [4.         , 4.12310563, 4.24264069, 4.35889894],
       [4.47213595, 4.58257569, 4.69041576, 4.79583152]])

```

▼ comparsion

```

a==a1

array([[False, False, False, False],
       [False, False, False, False],
       [False, False, False, False]])

```

```

a<2

array([[ True,  True, False, False],
       [False, False, False, False],
       [False, False, False, False]])

```

```

a>a1

array([[False, False, False, False],
       [False, False, False, False],
       [False, False, False, False]])

```

▼ aggregate function

```
a.sum()
```

```
66
```

```
a.min()
```

```
0
```

```
a.max()
```

```
11
```

```
a.cumsum()
```

```
array([ 0,  1,  3,  6, 10, 15, 21, 28, 36, 45, 55, 66])
```

```
a.mean()
```

```
5.5
```

▼ correlation coefficient

```
np.std(a)
```

```
3.452052529534663
```

[+ Code](#)[+ Text](#)