In [1]:

```
import numpy as np
```

In [2]:

```
#3D Array
```

In [3]:

```
a=np.array([[[1,2,3],[4,5,6],[7,8,9]]])
a
```

Out[3]:

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

In [4]:

```
a.shape
```

Out[4]:

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

In [5]:

```
len(a)
```

Out[5]:

```
1
```

In [6]:

```
a.ndim
```

Out[6]:

```
3
```

In [7]:

```
a.size
```

Out[7]:

```
9
```

In [8]:

```
a.dtype
```

Out[8]:

```
dtype('int32')
```

In [10]:

```
a1=np.zeros(5)
a1
```

Out[10]:

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

In [11]:

```
#create an array of one
```

In [13]:

```
a2=np.ones(5)
a2
```

Out[13]:

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

In [14]:

```
a3=np.arange(10,30,5)
a3
```

Out[14]:

```
array([10, 15, 20, 25])
```

In [15]:

```
a4=np.linspace(0,10,8)
a4
```

Out[15]:

```
array([ 0.        ,  1.42857143,  2.85714286,  4.28571429,  5.71428571,
        7.14285714,  8.57142857, 10.        ])
```

In [16]:

```
#Aritthematic Operation
```

In [17]:

```
#Addition
```

In [18]:

```
a=np.array([[[1,2,3],[4,5,6],[7,8,9]]])
b=np.array([[[10,11,12],[13,14,15],[16,17,18]]])
a+b
```

Out[18]:

```
array([[[11, 13, 15],
        [17, 19, 21],
        [23, 25, 27]]])
```

In [19]:

```
#Subtraction
```

In [20]:

```
a=np.array([[[1,2,3],[4,5,6],[7,8,9]]])
b=np.array([[[10,11,12],[13,14,15],[16,17,18]]])
a-b
```

Out[20]:

```
array([[[-9, -9, -9],
        [-9, -9, -9],
        [-9, -9, -9]]])
```

In [21]:

```
#Multiplication
```

In [22]:

```
a=np.array([[[1,2,3],[4,5,6],[7,8,9]]])
b=np.array([[[10,11,12],[13,14,15],[16,17,18]]])
a*b
```

Out[22]:

```
array([[[ 10,  22,  36],
        [ 52,  70,  90],
        [112, 136, 162]]])
```

In [23]:

```
#Division
```

In [25]:

```
a=np.array([[[1,2,3],[4,5,6],[7,8,9]]])
b=np.array([[[10,11,12],[13,14,15],[16,17,18]]])
a/b
```

Out[25]:

```
array([[[0.1       , 0.18181818, 0.25      ],
        [0.30769231, 0.35714286, 0.4       ],
        [0.4375    , 0.47058824, 0.5       ]]])
```

In [26]:

```
#Exponent
```

In [27]:

```
np.exp(b)
```

Out[27]:

```
array([[[2.20264658e+04, 5.98741417e+04, 1.62754791e+05],
        [4.42413392e+05, 1.20260428e+06, 3.26901737e+06],
        [8.88611052e+06, 2.41549528e+07, 6.56599691e+07]]])
```

In [28]:

```
#Square Root
```

In [29]:

```
np.sqrt(b)
```

Out[29]:

```
array([[[3.16227766, 3.31662479, 3.46410162],
        [3.60555128, 3.74165739, 3.87298335],
        [4.        , 4.12310563, 4.24264069]]])
```

In [30]:

```
#Comparison
```

In [31]:

```
a==b
```

Out[31]:

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

In [32]:

```
a>2
```

Out[32]:

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

In [33]:

```
#Aggregate Function
```

In [34]:

```
a.sum()
```

Out[34]:

```
45
```

In [35]:

```
a.min()
```

Out[35]:

```
1
```

In [36]:

```
a.max()
```

Out[36]:

```
9
```

In [37]:

```
a.cumsum()
```

Out[37]:

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

In [38]:

```
a.mean()
```

Out[38]:

```
5.0
```

In [42]:

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

Out[42]:

```
2.581988897471611
```