

```
In [4]: import numpy as np
```

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

```
Out[5]: array([1, 2, 3])
```

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

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

```
In [7]: np.arange(5,11)
```

```
Out[7]: array([ 5,  6,  7,  8,  9, 10])
```

```
In [8]: np.arange(1,100)
```

```
Out[8]: array([ 1,  2,  3,  4,  5,  6,  7,  8,  9, 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, 50, 51,  
              52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68,  
              69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85,  
              86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99])
```

```
In [9]: np.arange(1,32,5)
```

```
Out[9]: array([ 1,  6, 11, 16, 21, 26, 31])
```

```
In [10]: np.arange(5)
```

```
Out[10]: array([0, 1, 2, 3, 4])
```

```
In [11]: np.zeros(10)
```

```
Out[11]: array([0., 0., 0., 0., 0., 0., 0., 0., 0., 0.])
```

```
In [12]: np.zeros(10,int)
```

```
Out[12]: array([0, 0, 0, 0, 0, 0, 0, 0, 0, 0])
```

```
In [13]: np.ones((2,3))
```

```
Out[13]: array([[1., 1., 1.],  
              [1., 1., 1.]])
```

```
In [14]: np.ones((2,3),int)
```

```
Out[14]: array([[1, 1, 1],  
              [1, 1, 1]])
```



```
In [25]: rand_array=np.random.randint(0,10,50)
rand_array
```

```
Out[25]: array([0, 9, 7, 4, 2, 2, 7, 2, 4, 9, 9, 0, 3, 8, 3, 8, 6, 8, 4, 5, 8, 8,
               4, 0, 4, 4, 1, 3, 9, 0, 2, 2, 7, 4, 9, 0, 4, 1, 1, 6, 0, 0, 2, 0,
               3, 3, 1, 9, 9, 9])
```

```
In [26]: sample_array.reshape(5,6)
```

```
Out[26]: array([[ 0,  1,  2,  3,  4,  5],
                [ 6,  7,  8,  9, 10, 11],
                [12, 13, 14, 15, 16, 17],
                [18, 19, 20, 21, 22, 23],
                [24, 25, 26, 27, 28, 29]])
```

```
In [27]: sample_array.reshape(4,3)
```

```
-----
-
ValueError                                Traceback (most recent call las
t)
Cell In[27], line 1
----> 1 sample_array.reshape(4,3)

ValueError: cannot reshape array of size 30 into shape (4,3)
```

```
In [28]: rand_array.max()
```

```
Out[28]: 9
```

```
In [29]: rand_array.min()
```

```
Out[29]: 0
```

```
In [30]: rand_array.argmax()
```

```
Out[30]: 1
```

```
In [31]: a=np.eye(5)
a
```

```
Out[31]: array([[1., 0., 0., 0., 0.],
                [0., 1., 0., 0., 0.],
                [0., 0., 1., 0., 0.],
                [0., 0., 0., 1., 0.],
                [0., 0., 0., 0., 1.]])
```

```
In [32]: a.T
```

```
Out[32]: array([[1., 0., 0., 0., 0.],
                [0., 1., 0., 0., 0.],
                [0., 0., 1., 0., 0.],
                [0., 0., 0., 1., 0.],
                [0., 0., 0., 0., 1.]])
```

```
In [33]: a=np.random.rand(2,3)
a
```

```
Out[33]: array([[0.52407466, 0.08963979, 0.28850371],
               [0.50836032, 0.57005542, 0.64256239]])
```

```
In [39]: a.T
```

```
Out[39]: array([[0.52407466, 0.50836032],
               [0.08963979, 0.57005542],
               [0.28850371, 0.64256239]])
```

```
In [ ]: TWO DIMENSIONAL ARRAY
```

```
In [42]: sample_matrix=np.array([[24,13,2,15],[15,2,54,65],[56,76,24,7]])
sample_matrix
```

```
Out[42]: array([[24, 13,  2, 15],
               [15,  2, 54, 65],
               [56, 76, 24,  7]])
```

```
In [43]: sample_matrix[0][2]
```

```
Out[43]: 2
```

```
In [44]: sample_matrix[:,2]
```

```
Out[44]: array([ 2, 54, 24])
```

```
In [45]: sample_matrix[1,1]
```

```
Out[45]: 2
```

```
In [46]: sample_matrix[1:3,2:4]
```

```
Out[46]: array([[54, 65],
               [24,  7]])
```

```
In [47]: sample_matrix[1:,2:]
```

```
Out[47]: array([[54, 65],
               [24,  7]])
```

```
In [48]: sample_matrix[2]
```

```
Out[48]: array([56, 76, 24,  7])
```

```
In [ ]: SELECTION TECHNIQUES
```

```
In [49]: sample_array=np.arange(1,31)
sample_array
```

```
Out[49]: array([ 1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13, 14, 15, 16, 17,
               18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30])
```

```
In [50]: sample_array+sample_array
```

```
Out[50]: array([ 2,  4,  6,  8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34,
                36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60])
```

```
In [51]: np.exp(sample_array)
```

```
Out[51]: array([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, 1.62754791e+05,
                4.42413392e+05, 1.20260428e+06, 3.26901737e+06, 8.88611052e+06,
                2.41549528e+07, 6.56599691e+07, 1.78482301e+08, 4.85165195e+08,
                1.31881573e+09, 3.58491285e+09, 9.74480345e+09, 2.64891221e+10,
                7.20048993e+10, 1.95729609e+11, 5.32048241e+11, 1.44625706e+12,
                3.93133430e+12, 1.06864746e+13])
```

```
In [52]: np.sqrt(sample_array)
```

```
Out[52]: array([1.          , 1.41421356, 1.73205081, 2.          , 2.23606798,
                2.44948974, 2.64575131, 2.82842712, 3.          , 3.16227766,
                3.31662479, 3.46410162, 3.60555128, 3.74165739, 3.87298335,
                4.          , 4.12310563, 4.24264069, 4.35889894, 4.47213595,
                4.58257569, 4.69041576, 4.79583152, 4.89897949, 5.          ,
                5.09901951, 5.19615242, 5.29150262, 5.38516481, 5.47722558])
```

```
In [53]: np.log(sample_array)
```

```
Out[53]: array([0.          , 0.69314718, 1.09861229, 1.38629436, 1.60943791,
                1.79175947, 1.94591015, 2.07944154, 2.19722458, 2.30258509,
                2.39789527, 2.48490665, 2.56494936, 2.63905733, 2.7080502 ,
                2.77258872, 2.83321334, 2.89037176, 2.94443898, 2.99573227,
                3.04452244, 3.09104245, 3.13549422, 3.17805383, 3.21887582,
                3.25809654, 3.29583687, 3.33220451, 3.36729583, 3.40119738])
```

```
In [54]: np.max(sample_array)
```

```
Out[54]: 30
```

```
In [55]: np.min(sample_array)
```

```
Out[55]: 1
```

```
In [56]: np.argmax(sample_array)
```

```
Out[56]: 29
```

```
In [57]: np.square(sample_array)
```

```
Out[57]: array([ 1,  4,  9, 16, 25, 36, 49, 64, 81, 100, 121, 144, 169,
                196, 225, 256, 289, 324, 361, 400, 441, 484, 529, 576, 625, 676,
                729, 784, 841, 900])
```

```
In [58]: np.std(sample_array)
```

```
Out[58]: 8.65544144839919
```

```
In [59]: np.var(sample_array)
```

```
Out[59]: 74.91666666666667
```

```
In [60]: np.mean(sample_array)
```

```
Out[60]: 15.5
```

```
In [61]: array=np.random.randn(3,4)
array
```

```
Out[61]: array([[ -1.63820778,  1.35546063,  0.33881829,  0.96057042],
                [-0.2461068 , -0.68860529, -1.16327628,  0.15382975],
                [-0.4311933 , -0.83006664,  0.7936202 ,  0.05910007]])
```

```
In [62]: np.round(array,decimals=3)
```

```
Out[62]: array([[ -1.638,  1.355,  0.339,  0.961],
                [-0.246, -0.689, -1.163,  0.154],
                [-0.431, -0.83 ,  0.794,  0.059]])
```

```
In [63]: sports=np.array(['golf','cricket','football','cricket'])
np.unique(sports)
```

```
Out[63]: array(['cricket', 'football', 'golf'], dtype='<U8')
```

```
In [ ]:
```