

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

creating array in numpy

In [13]: myarr=np.array([1,2,34,])

In [14]: myarr

Out[14]: array([ 1,  2, 34])

agar array bada ho to khud manage krega

In [15]: myarr=np.array([1,2,3,45],np.int64)

In [16]: myarr

Out[16]: array([ 1,  2,  3, 45], dtype=int64)

In [17]: myarr=np.array([[1,2,3,45]],np.int64)

In [18]: myarr[0,2]

Out[18]: 3

In [19]: myarr=np.array([1,2,3,45],np.int64)

In [20]: myarr[3]

Out[20]: 45

In [21]: myarr.shape

Out[21]: (4,)
```

```
In [22]: myarr.dtype

Out[22]: dtype('int64')
```

```
In [23]: myarr[0,1]=60

-----
IndexError                                Traceback (most recent call last)
<ipython-input-23-0814de94be16> in <module>
----> 1 myarr[0,1]=60

IndexError: too many indices for array: array is 1-dimensional, but 2 were indexed
```

```
In [24]: myarr=np.array([1,2,3,45],np.int64)

In [25]: myarr

Out[25]: array([ 1,  2,  3, 45], dtype=int64)
```

```
In [26]: myarr[0,2]=60

-----
IndexError                                Traceback (most recent call last)
<ipython-input-26-0248e8cf25eb> in <module>
----> 1 myarr[0,2]=60

IndexError: too many indices for array: array is 1-dimensional, but 2 were indexed
```

```
In [27]: myarr=np.array([[1,2,3,45]],np.int64)

In [28]: myarr

Out[28]: array([[ 1,  2,  3, 45]], dtype=int64)

In [29]: myarr[0,2]=60

In [30]: myarr

Out[30]: array([[ 1,  2, 60, 45]], dtype=int64)

In [31]: myarr=np.array([1,2,3,45],np.int64)

In [32]: myarr

Out[32]: array([ 1,  2,  3, 45], dtype=int64)
```

```
In [33]: myarr[3]=60

In [34]: myarr

Out[34]: array([ 1,  2,  3, 60], dtype=int64)
```

array creation method in numpy

1) conversion from other source python(ex:- str,list,tuple)

```
In [35]: listarray=np.array([[1,2,3],[4,5,6],[7,8,9]])

In [36]: listarray

Out[36]: array([[1, 2, 3],
               [4, 5, 6],
               [7, 8, 9]])

In [37]: listarray.dtype

Out[37]: dtype('int32')
```

```
In [38]: listarray.shape

Out[38]: (3, 3)
```

```
In [39]: listarray.size

Out[39]: 9
```

2) intrinsic numpy array creation objects(ex:- arange,ones,zeros etc.)

```
In [40]: zeros=np.zeros((2,5))

In [41]: zeros

Out[41]: array([[0., 0., 0., 0., 0.],
               [0., 0., 0., 0., 0.]])

In [42]: zeros=np.zeros((2,5))

In [43]: zeros.dtype

Out[43]: dtype('float64')
```

```
In [44]: zeros.shape

Out[44]: (2, 5)
```

```
In [45]: rng=np.arange(10)

In [46]: rng

Out[46]: array([0, 1, 2, 3, 4, 5, 6, 7, 8, 9])

In [47]: lspace=np.linspace(1,3,4)

In [48]: lspace

Out[48]: array([1.          , 1.66666667, 2.33333333, 3.          ])
```

```
In [49]: lspace=np.linspace(1,5,8)

In [50]: lspace

Out[50]: array([1.          , 1.57142857, 2.14285714, 2.71428571, 3.28571429,
               3.85714286, 4.42857143, 5.          ])
```

```
In [51]: emp=np.empty((4,6))

In [52]: emp

Out[52]: array([[1.48729778e-312, 1.48646480e-312, 1.69121096e-306,
               1.78020169e-306, 4.45058910e-308, 1.78021119e-306],
               [1.42413555e-306, 1.78019082e-306, 1.37960147e-306,
               1.33511502e-306, 2.22510251e-306, 1.33511969e-306],
               [1.78022342e-306, 1.05700345e-307, 1.11261502e-306,
               1.42410839e-306, 7.56597770e-307, 6.23059720e-307],
               [1.37961913e-306, 7.56599128e-307, 1.11260144e-306,
               6.89812281e-307, 2.22522996e-306, 3.91786943e-317]])
```

```
In [53]: import numpy as np

In [54]: lspace=np.linspace(1,3,4)

In [55]: lspace

Out[55]: array([1.          , 1.66666667, 2.33333333, 3.          ])
```

```
In [56]: emp_like=np.empty_like(lspace)

In [57]: emp_like

Out[57]: array([1.          , 1.66666667, 2.33333333, 3.          ])
```

```
In [58]: ide=np.identity(12)

In [59]: ide

Out[59]: array([[1., 0., 0., 0., 0., 0., 0., 0., 0., 0., 0., 0.],
               [0., 1., 0., 0., 0., 0., 0., 0., 0., 0., 0., 0.],
               [0., 0., 1., 0., 0., 0., 0., 0., 0., 0., 0., 0.],
               [0., 0., 0., 1., 0., 0., 0., 0., 0., 0., 0., 0.],
               [0., 0., 0., 0., 1., 0., 0., 0., 0., 0., 0., 0.],
               [0., 0., 0., 0., 0., 1., 0., 0., 0., 0., 0., 0.],
               [0., 0., 0., 0., 0., 0., 1., 0., 0., 0., 0., 0.],
               [0., 0., 0., 0., 0., 0., 0., 1., 0., 0., 0., 0.],
               [0., 0., 0., 0., 0., 0., 0., 0., 1., 0., 0., 0.],
               [0., 0., 0., 0., 0., 0., 0., 0., 0., 1., 0., 0.],
               [0., 0., 0., 0., 0., 0., 0., 0., 0., 0., 1., 0.],
               [0., 0., 0., 0., 0., 0., 0., 0., 0., 0., 0., 1.]])

In [60]: ide.shape

Out[60]: (12, 12)
```

```
In [61]: arr=np.arange(99)

In [62]: arr

Out[62]: 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, 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])

In [63]: arr.reshape(3,33)

Out[63]: 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, 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]])

In [64]: arr=arr.ravel()
```

numpy axis

```
In [65]: x=[[1,2,3],[4,5,6],[7,1,0]]

In [66]: ar=np.array(x)

In [67]: ar

Out[67]: array([[1, 2, 3],
               [4, 5, 6],
               [7, 1, 0]])

In [68]: ar.sum(axis=0)

Out[68]: array([12,  8,  9])

In [69]: ar.sum(axis=1)

Out[69]: array([ 6, 15,  8])

In [70]: ar.T

Out[70]: array([[1, 4, 7],
               [2, 5, 1],
               [3, 6, 0]])

In [71]: ar.ndin

-----
AttributeError                                Traceback (most recent call last)
<ipython-input-71-ee3920487c67> in <module>
----> 1 ar.ndin

AttributeError: 'numpy.ndarray' object has no attribute 'ndin'
```

```
In [72]: ar.size

Out[72]: 9

In [73]: ar.nbytes

Out[73]: 36

In [74]: one=np.array([1,2,3,4,5])

In [75]: one.argmax()

Out[75]: 4

In [76]: one.argmin()

Out[76]: 0

In [77]: one.argsort()

Out[77]: array([0, 1, 2, 3, 4], dtype=int64)

In [78]: ar

Out[78]: array([[1, 2, 3],
               [4, 5, 6],
               [7, 1, 0]])

In [79]: ar.argmin()

Out[79]: 8

In [80]: ar.argmax(axis=0)

Out[80]: array([2, 1, 1], dtype=int64)

In [81]: ar.argmin(axis=1)

Out[81]: array([0, 0, 2], dtype=int64)

In [82]: ar.argsort(axis=1)

Out[82]: array([[0, 1, 2],
               [0, 1, 2],
               [2, 1, 0]], dtype=int64)

In [83]: ar.ravel()

Out[83]: array([1, 2, 3, 4, 5, 6, 7, 1, 0])

In [84]: ar2=np.array([[1,2,3],[3,5,6],[3,5,2]])

In [85]: ar2

Out[85]: array([[1, 2, 3],
               [3, 5, 6],
               [3, 5, 2]])

In [86]: ar*ar2

Out[86]: array([[ 2,  4,  6],
               [ 7, 10, 12],
               [10,  6,  2]])

In [87]: np.sqrt(ar)

Out[87]: array([[1.          ,  1.41421356,  1.73205081],
               [2.          ,  2.23606798,  2.44948974],
               [2.64575131,  1.          ,  0.          ]])

In [88]: ar.sum()

Out[88]: 29

In [89]: ar.max()

Out[89]: 7

In [90]: ar.min()

Out[90]: 0

In [91]: np.where(ar>5)

Out[91]: (array([1, 2], dtype=int64), array([2, 0], dtype=int64))

In [92]: type(np.where(ar>4))

Out[92]: tuple

In [93]: np.count_nonzero(ar)

Out[93]: 8

In [94]: np.count_zero(ar)

-----
AttributeError                                Traceback (most recent call last)
<ipython-input-94-eb6cc7590b18> in <module>
----> 1 np.count_zero(ar)

c:\python37\lib\site-packages\numpy\_init_.py in _getattr_ (attr)
   212             return Tester
--> 214         else raise AttributeError("module {!r} has no attribute "
   215                                "{!r}".format(__name__, attr))
   216

AttributeError: module 'numpy' has no attribute 'count_zero'
```

```
In [95]: import sys

In [96]: py_r=[0,4,5,5,6]

In [97]: np_r=np.array(py_r)

In [100]: sys.getsizeof(1)*len(py-r)

-----
NameError                                Traceback (most recent call last)
<ipython-input-100-534f97a786cb> in <module>
----> 1 sys.getsizeof(1)*len(py-r)

NameError: name 'py' is not defined
```

```
In [ ]:
```