

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

```
In [2]: np.__version__
```

```
Out[2]: '1.26.4'
```

```
In [3]: l=[1,2,3]
        1
```

```
Out[3]: [1, 2, 3]
```

```
In [4]: arr=np.array(1)
```

```
In [5]: arr
```

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

```
In [6]: np.arange(15)
```

```
Out[6]: array([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13, 14])
```

```
In [7]: np.zeros(3) #parameter tuning
```

```
Out[7]: array([0., 0., 0.])
```

```
In [8]: np.zeros(3,dtype=int) #hyper parameter tuning
```

```
Out[8]: array([0, 0, 0])
```

```
In [9]: np.arange(10,20)
```

```
Out[9]: array([10, 11, 12, 13, 14, 15, 16, 17, 18, 19])
```

```
In [10]: np.arange(-10,10)
```

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

```
In [11]: np.arange(10,10)
```

```
Out[11]: array([], dtype=int32)
```

```
In [13]: np.zeros((2,2),dtype=int)
```

```
Out[13]: array([[0, 0],
                [0, 0]])
```

```
In [14]: np.zeros((10,30))
```

[illegible]

```
In [15]: np.ones(3)
```

```
Out[15]: array([1., 1., 1.])
```

```
In [17]: np.ones((4,2))
```

```
Out[17]: array([[1., 1.],
                [1., 1.],
                [1., 1.],
                [1., 1.]])
```

```
In [18]: np.twos(2)
```

```
AttributeError                                Traceback (most recent call last)
Cell In[18], line 1
----> 1 np.twos(2)

File ~\anaconda3\Lib\site-packages\numpy\__init__.py:333, in __getattr__(attr)
    330     "Removed in NumPy 1.25.0"
    331     raise RuntimeError("Tester was removed in NumPy 1.25.")
--> 333 raise AttributeError("module {!r} has no attribute "
    334                        "{!r}".format(__name__, attr))

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

```
In [19]: np.threes((2,3))
```

```

-----
AttributeError                                Traceback (most recent call last)
Cell In[19], line 1
----> 1 np.threes((2,3))

File ~\anaconda3\Lib\site-packages\numpy\__init__.py:333, in __getattr__(attr)
    330     "Removed in NumPy 1.25.0"
    331     raise RuntimeError("Tester was removed in NumPy 1.25.")
--> 333 raise AttributeError("module {!r} has no attribute "
    334                        "{!r}".format(__name__, attr))

AttributeError: module 'numpy' has no attribute 'threes'

```

```
In [21]: np.random.rand(5)
```

```
Out[21]: array([0.22122235, 0.50365387, 0.06058961, 0.40138607, 0.23307779])
```

```
In [22]: np.random.rand(2,3)
```

```
Out[22]: array([[0.7956438 , 0.5233292 , 0.15252195],
                [0.93286217, 0.24952803, 0.72496125]])
```

```
In [27]: np.random.randint(2,4)
```

```
Out[27]: 3
```

```
In [30]: np.random.randint(3)
```

```
Out[30]: 0
```

```
In [32]: np.random.randint(2,10,20)
```

```
Out[32]: array([9, 9, 9, 2, 9, 7, 3, 4, 7, 8, 7, 3, 5, 4, 6, 5, 2, 4, 4, 8])
```

```
In [38]: np.random.randint(0,10)
```

```
Out[38]: 7
```

```
In [40]: np.random.rand(0,4)
```

```
Out[40]: array([], shape=(0, 4), dtype=float64)
```

#04-02-2025

```
In [2]: import numpy as np
```

```
In [3]: np.arange(10)
```

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

```
In [5]: arr=np.arange(5)
arr
```

```
Out[5]: array([0, 1, 2, 3, 4])
```

```
In [6]: arr=np.arange(10,20)
arr
```

```
Out[6]: array([10, 11, 12, 13, 14, 15, 16, 17, 18, 19])
```

```
In [8]: arr=np.random.rand(5)
arr
```

```
Out[8]: array([0.61769172, 0.71706919, 0.73794449, 0.1549057 , 0.92696088])
```

```
In [10]: arr=np.random.randint(10,20,10)
arr
```

```
Out[10]: array([15, 17, 12, 17, 15, 17, 12, 17, 16, 12])
```

```
In [12]: np.random.randint(5,10,(2,3))
```

```
Out[12]: array([[8, 7, 7],
               [9, 5, 8]])
```

```
In [14]: np.random.randint(1,100,(12,2))
```

```
Out[14]: array([[21, 2],
               [81, 27],
               [37, 14],
               [ 7, 2],
               [78, 3],
               [66, 66],
               [ 7, 71],
               [57, 16],
               [53, 36],
               [93, 33],
               [83, 56],
               [79, 75]])
```

```
In [59]: np.arange(1,13).reshape(3,4,order='a')
```

```
Out[59]: array([[ 1,  2,  3,  4],
               [ 5,  6,  7,  8],
               [ 9, 10, 11, 12]])
```

```
In [18]: b=np.random.randint(10,20,(5,4))
b
```

```
Out[18]: array([[11, 19, 13, 15],
               [18, 19, 15, 12],
               [17, 13, 19, 19],
               [10, 12, 12, 15],
               [10, 15, 14, 16]])
```

```
In [19]: type(b)
```

```
Out[19]: numpy.ndarray
```

```
In [22]: b[:]
```

```
Out[22]: array([[11, 19, 13, 15],
               [18, 19, 15, 12],
               [17, 13, 19, 19],
               [10, 12, 12, 15],
               [10, 15, 14, 16]])
```

```
In [23]: b[:3]
```

```
Out[23]: array([[11, 19, 13, 15],  
               [18, 19, 15, 12],  
               [17, 13, 19, 19]])
```

```
In [24]: b[1:]
```

```
Out[24]: array([[18, 19, 15, 12],  
               [17, 13, 19, 19],  
               [10, 12, 12, 15],  
               [10, 15, 14, 16]])
```

```
In [25]: b[1,2]
```

```
Out[25]: 15
```

```
In [28]: b[:,]
```

```
Out[28]: array([[11, 19, 13, 15],  
               [18, 19, 15, 12],  
               [17, 13, 19, 19],  
               [10, 12, 12, 15],  
               [10, 15, 14, 16]])
```

```
In [60]: b[-3:-1]
```

```
Out[60]: array([[17, 13, 19, 19],  
               [10, 12, 12, 15]])
```

```
In [30]: b[-1,-1]
```

```
Out[30]: 16
```

```
In [32]: b[::-1]
```

```
Out[32]: array([[10, 15, 14, 16],  
               [10, 12, 12, 15],  
               [17, 13, 19, 19],  
               [18, 19, 15, 12],  
               [11, 19, 13, 15]])
```

```
In [33]: b[:, :-2]
```

```
Out[33]: array([[10, 15, 14, 16],  
               [17, 13, 19, 19],  
               [11, 19, 13, 15]])
```

```
In [34]: b.max()
```

```
Out[34]: 19
```

```
In [36]: b.min()
```

```
Out[36]: 10
```

```
In [39]: b
```

```
Out[39]: array([[11, 19, 13, 15],
               [18, 19, 15, 12],
               [17, 13, 19, 19],
               [10, 12, 12, 15],
               [10, 15, 14, 16]])
```

```
In [41]: mat=np.arange(0,100).reshape(10,10)
mat
```

```
Out[41]: 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, 99]])
```

```
In [43]: mat[2:6,5:8]
```

```
Out[43]: array([[25, 26, 27],
               [35, 36, 37],
               [45, 46, 47],
               [55, 56, 57]])
```

```
In [47]: mat[3:7,5:8]
```

```
Out[47]: array([[35, 36, 37],
               [45, 46, 47],
               [55, 56, 57],
               [65, 66, 67]])
```

```
In [61]: r=2
c=3
mat[r,c]
```

```
Out[61]: 23
```

```
In [49]: mat
```

```
Out[49]: 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, 99]])
```

```
In [65]: mat[2:6] #prints 2nd row to sixth row
```

```
Out[65]: array([[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]])
```

```
In [64]: mat[3,6]#prints 3 rd row 6th column
```

```
Out[64]: 36
```

```
In [55]: mat[2]#prints only 2 nd row
```

```
Out[55]: array([20, 21, 22, 23, 24, 25, 26, 27, 28, 29])
```

```
In [56]: mat[:3]
```

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