In [1]:
```
import numpy as np
a=np.array([1,2,3,4,5,6,7])
print(a)
```

```
[1 2 3 4 5 6 7]
```

In [2]:
```
import numpy as np
a=np.array([0,0,0,0,0,0,0,0])
print(a)
```

```
[0 0 0 0 0 0 0 0]
```

In [3]:
```
import numpy as np
a=np.array([1,1,1,1,1,1,1])
print(a)
```

```
[1 1 1 1 1 1 1]
```

In [4]:
```
from numpy import random
a=random.randint(100,size=(2,3))
print(a)
```

```
[[20 98 46]
 [99 86 24]]
```

In [5]:
```
import numpy as np
a=np.array([[1,2,3,4,5,6,7],[8,9,10,11,12,13,14]])
print(a)
```

```
[[ 1  2  3  4  5  6  7]
 [ 8  9 10 11 12 13 14]]
```

In [6]:
```
import numpy as np
a=np.matrix([[1,2,3,4],[5,6,7,8]],dtype=int,copy=True)
print(a)
```

```
[[1 2 3 4]
 [5 6 7 8]]
```

In [7]:
```
import numpy as np
a=np.array([1,2,3,4,5,6,7])
print(a)
np.linspace(1,10)
```

```
[1 2 3 4 5 6 7]
```

Out[7]:
```
array([ 1.        ,  1.18367347,  1.36734694,  1.55102041,  1.73469388,
        1.91836735,  2.10204082,  2.28571429,  2.46938776,  2.65306122,
        2.83673469,  3.02040816,  3.20408163,  3.3877551 ,  3.57142857,
        3.75510204,  3.93877551,  4.12244898,  4.30612245,  4.48979592,
        4.67346939,  4.85714286,  5.04081633,  5.2244898 ,  5.40816327,
        5.59183673,  5.7755102 ,  5.95918367,  6.14285714,  6.32653061,
        6.51020408,  6.69387755,  6.87755102,  7.06122449,  7.24489796,
        7.42857143,  7.6122449 ,  7.79591837,  7.97959184,  8.16326531,
        8.34693878,  8.53061224,  8.71428571,  8.89795918,  9.08163265,
        9.26530612,  9.44897959,  9.63265306,  9.81632653, 10.        ])
```

In [8]:
```
import numpy as np
a=np.array([[1,2,3,4,5,6,7],[8,9,10,11,12,13,14],[15,16,17,18,19,20,21]])
print(a)
print("the dimension of array is:",a.ndim)
```

```
[[ 1  2  3  4  5  6  7]
 [ 8  9 10 11 12 13 14]
 [15 16 17 18 19 20 21]]
the dimension of array is: 2
```

In [9]:
```
import numpy as np
a=np.array([[1,2,3,4,5,6,7],[8,9,10,11,12,13,14],[15,16,17,18,19,20,21]])
print(a)
print("the shape of array is:",a.shape)
```

```
[[ 1  2  3  4  5  6  7]
 [ 8  9 10 11 12 13 14]
 [15 16 17 18 19 20 21]]
the shape of array is: (3, 7)
```

In [10]:
```
import numpy as np
a=np.array([[1,2,3,4,5,6,7],[8,9,10,11,12,13,14],[15,16,17,18,19,20,21]])
print(a)
print("the size of array is:",a.itemsize)
```

```
[[ 1  2  3  4  5  6  7]
 [ 8  9 10 11 12 13 14]
 [15 16 17 18 19 20 21]]
the size of array is: 4
```

In [11]:
```
import numpy as np
a=np.array([[1,2],[8,9],[15,16]])
print("the original array:",a)
a=a.reshape(2,3)
print("the reshaped array:",a)
```

```
the original array: [[ 1  2]
 [ 8  9]
 [15 16]]
the reshaped array: [[ 1  2  8]
 [ 9 15 16]]
```

In [12]:
```
print("flattening in row major",a.flatten(order='C'))
print("flattening in column major",a.flatten(order='F'))
```

```
flattening in row major [ 1  2  8  9 15 16]
flattening in column major [ 1  9  2 15  8 16]
```

In [13]:
```
from numpy import random
a=random.randint(100,size=(2,3))
print(a)
print("transpose:")
print(a.transpose())
```

```
[[50 94 89]
 [48 92 49]]
transpose:
[[50 48]
 [94 92]
 [89 49]]
```

In [14]:
```
import numpy as np
arr=np.array ( [1,2,3,4,5,6,7])
print("slicing numpy 1-d array")
print(arr[4:])
print(arr[1:5])
print(arr[-3 :- 1])
print(arr[1])
print(arr[0:1])
print(arr[:1])
print(arr[ :: ])
```

```
slicing numpy 1-d array
[5 6 7]
[2 3 4 5]
[5 6]
2
[1]
[1]
[1 2 3 4 5 6 7]
```

In [15]:
```
print("slicing numpy 2-d array")
arr1=np.array ([[1,2,3,4,5], [6,7,8,9,10]])
print("2nd element on 1st row:", arr1[0,1])
arr2=np.array ([[[1,2,3], [4,5,6]], [ [7,8,9], [10, 11,12]]])
print ("Access the third element of second array of the first array: ", arr2[0, 1,2]
```

```
slicing numpy 2-d array
2nd element on 1st row: 2
Access the third element of second array of the first array:  6
```

In [18]:
```
import numpy as np
array_3d = np.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]]
])
print("array:",array_3d)
print("slicing 3 d array:")
subarray = array_3d[0:2, 1:3, 0:2]
print(subarray)
print("sliced array:")
sliced_array = array_3d[:, ::2, ::2]
print(sliced_array)
```

```
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]]]
slicing 3 d array:
[[[ 4  5]
  [ 7  8]]

 [[13 14]
  [16 17]]]
sliced array:
[[[ 1  3]
  [ 7  9]]

 [[10 12]
  [16 18]]

 [[19 21]
  [25 27]]]
```

In [22]:
```
x=([0, 1, 2, 3, 4])
print(x[0:-1])
print(x[-1:0])
print(x[1:-1])
```

```
[0, 1, 2, 3]
[]
[1, 2, 3]
```

In [ ]:
```

```