In [1]:
```
#import numpy package
import numpy as np
list=[[10,20,30,40],[4,54,76,12]]
ny=np.array(list)
print(ny)
```

```
[[10 20 30 40]
 [ 4 54 76 12]]
```

In [4]:
```
# numpy array type #use list

import numpy as np
list=[[10,20,30,40],[4,54,76,12]]
ny=np.array(list)

print(type(ny))
```

```
<class 'numpy.ndarray'>
```

In [ ]:
```
# nidm
import numpy as np
list=[[10,20,30,40],[4,54,76,12]]
ny=np.array(list)
print(ny.ndim)
```

In [5]:
```
# numpy array type #use tuple
#array type , nidm

import numpy as np
tuple=[(10,20,30,40),(23,43,53,67,)]
ny=np.array(list)
print(ny)
print(type(ny))
print(ny.ndim)
```

```
[[10 20 30 40]
 [ 4 54 76 12]]
<class 'numpy.ndarray'>
2
```

In [6]:
```
#slicing numpy array

import numpy as np
list=[10,20,30,40,54,76,12]
ny=np.array(list)

ny[::2]
```

Out[6]:
```
array([10, 30, 54, 12])
```

In [11]:
```
#num in numpy arr
arr1=np.zeros(3)
arr2=np.ones(2)
print(arr1)
print(arr2)
```

```
[0. 0. 0.]
[1. 1.]
```

In [7]:
```
#numpy array shape

import numpy as np
list2=[[10,23,45],[45,76,78],[54,64,89],[12,34,45]]
ny1=np.array(list2)
print(ny1.shape)
```

```
(4, 3)
```

In [8]:
```
# T shape array
import numpy as np
list2=[[10,23,45],[45,76,78],[54,64,89],[12,34,45]]
ny1=np.array(list2)
print(ny1.shape)

print(ny1.T)
```

```
(4, 3)
[[10 45 54 12]
 [23 76 64 34]
 [45 78 89 45]]
```

In [12]:
```
#max
import numpy as np
list2=[[10,23,45],[45,76,78],[54,64,89],[12,34,45]]
ny1=np.array(list2)
print(ny1)
print(ny1.max())
```

```
[[10 23 45]
 [45 76 78]
 [54 64 89]
 [12 34 45]]
89
```

In [13]:
```
#min
import numpy as np
list2=[[10,23,45],[45,76,78],[54,64,89],[12,34,45]]
ny1=np.array(list2)
print(ny1)
print(ny1.min())
```

```
[[10 23 45]
 [45 76 78]
 [54 64 89]
 [12 34 45]]
10
```

In [14]:
```
#sum
import numpy as np
list2=[[10,23,45],[45,76,78],[54,64,89],[12,34,45]]
ny1=np.array(list2)
print(ny1)
print(ny.sum())
```

```
[[10 23 45]
 [45 76 78]
 [54 64 89]
 [12 34 45]]
242
```

In [18]:
```
#reshape arr
import numpy as np
list2=[[10,23,45],[45,76,78],[54,64,89],[12,34,45]]
ny1=np.array(list2)
print(f"arr:{ny1}")
print(f"arr1:{ny1.reshape(4,3)}")
print(f"arr2:{ny1.reshape(6,2)}")
```

```
arr:[[10 23 45]
 [45 76 78]
 [54 64 89]
 [12 34 45]]
arr1:[[10 23 45]
 [45 76 78]
 [54 64 89]
 [12 34 45]]
arr2:[[10 23]
 [45 45]
 [76 78]
 [54 64]
 [89 12]
 [34 45]]
```

In [45]:
```
#nonzero count

import numpy as np
list2=[[10,23,0,45],[45,0,76,78],[0,54,64,89],[12,34,45,1]]
ny1=np.array(list2)
print(np.count_nonzero(ny1))
```

```
13
```

In [47]:
```
#sort numpy arr
import numpy as np
list2=[[10,23,45,40],[45,76,32,78],[54,64,12,89],[12,2,34,45]]
ny1=np.array(list2)
ny1.sort()
ny1
```

Out[47]:
```
array([[10, 23, 40, 45],
       [32, 45, 76, 78],
       [12, 54, 64, 89],
       [ 2, 12, 34, 45]])
```

In [68]:
```
#flatten numpy arr
import numpy as np
list2=[[10,23,45,40],[45,76,32,78],[54,64,12,89],[12,2,34,45]]
ny1=np.array(list2)
print(ny1.flatten())
```

```
[10 23 45 40 45 76 32 78 54 64 12 89 12  2 34 45]
```

In [50]:
```
#add value
import numpy as np
list2=[[10,23,45,40],[45,76,32,78],[54,64,12,89],[12,2,34,45]]
ny1=np.array(list2)
print(ny1+2)
```

```
[[12 25 47 42]
 [47 78 34 80]
 [56 66 14 91]
 [14  4 36 47]]
```

In [52]:
```
#diagonal if matrix
import numpy as np
list2=[[10,23,45,40],[45,76,32,78],[54,64,12,89],[12,2,34,45]]
ny1=np.array(list2)
ny1.diagonal()
```

Out[52]:
```
array([10, 76, 12, 45])
```

In [54]:
```
#trace
import numpy as np
list2=[[10,23,45,40],[45,76,32,78],[54,64,12,89],[12,2,34,45]]
ny1=np.array(list2)
ny1.trace()
```

Out[54]:
```
143
```

In [67]:
```
#adding and subtraction matrix
import numpy as np
matrix1=[[11,23,45],[43,23,45],[67,34,56]]
matrix2=[[76,32,43],[12,43,54],[90,23,54]]
matrix_a=np.array(matrix1)
matrix_b=np.array(matrix2)

np.add(matrix_a,matrix_b)
```

Out[67]:
```
array([[ 87,  55,  88],
       [ 55,  66,  99],
       [157,  57, 110]])
```

In [66]:
```
import numpy as np
matrix1=[[11,23,45],[43,23,45],[67,34,56]]
matrix2=[[76,32,43],[12,43,54],[90,23,54]]
matrix_a=np.array(matrix1)
matrix_b=np.array(matrix2)

np.subtract(matrix_a,matrix_b)
```

Out[66]:
```
array([[-65,  -9,   2],
       [ 31, -20,  -9],
       [-23,  11,   2]])
```

In [64]:
```
#sum
import numpy as np
matrix1=[[11,23,45],[43,23,45],[67,34,56]]
```

```
matrix2=[[76,32,43],[12,43,54],[90,23,54]]
matrix_a=np.array(matrix1)
matrix_b=np.array(matrix2)
matrix_a+matrix_b
```

Out[64]:
```
array([[ 87,  55,  88],
       [ 55,  66,  99],
       [157,  57, 110]])
```

In [63]:
```
#subtract
import numpy as np
matrix1=[[11,23,45],[43,23,45],[67,34,56]]
matrix2=[[76,32,43],[12,43,54],[90,23,54]]
matrix_a=np.array(matrix1)
matrix_b=np.array(matrix2)
matrix_a-matrix_b
```

Out[63]:
```
array([[-65,  -9,   2],
       [ 31, -20,  -9],
       [-23,  11,   2]])
```

In [ ]: