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

a = np.arange(6)

print('Arreglo a =', a, '\n')

print('Tipo de a =', a.dtype, '\n')

print('Dimensión de a =', a.ndim, '\n')

print('Número de elementos de a =', a.shape)
```

```
Arreglo a = [0 1 2 3 4 5]

Tipo de a = int32

Dimensión de a = 1

Número de elementos de a = (6,)
```

In [2]:
```
m = np.array([np.arange(2), np.arange(2)])
print(m)
```

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

In [3]:
```
a = np.array([[1,2], [3,4]])
print('a =\n', a, '\n')
print('a[0,0] =', a[0,0], '\n')
print('a[0,1] =', a[0,1], '\n')
print('a[1,0] =', a[1,0], '\n')
print('a[1,1] =', a[1,1])
```

```
a =
 [[1 2]
 [3 4]]

a[0,0] = 1

a[0,1] = 2

a[1,0] = 3

a[1,1] = 4
```

In [4]:
```
a = np.arange(9)
print('a =', a, '\n')

print('a[0:9] = ', a[0:9], '\n')

print('a[3,7] =', a[3:7])
```

```
a = [0 1 2 3 4 5 6 7 8]

a[0:9] =  [0 1 2 3 4 5 6 7 8]

a[3,7] = [3 4 5 6]
```

In [6]:
```
print('a[0:9:1] =', a[0:9:1], '\n')


print('a[:9:1] =', a[:9:1], '\n')

print('a[0:9:2] =', a[0:9:2], '\n')

print('a[0:9:3] =', a[0:9:3])
```

```
a[0:9:1] = [0 1 2 3 4 5 6 7 8]

a[:9:1] = [0 1 2 3 4 5 6 7 8]

a[0:9:2] = [0 2 4 6 8]

a[0:9:3] = [0 3 6]
```

In [7]:
```
print('a[9:0:-1] =', a[9:0:-1], '\n')

print('a[::-1] =', a[::-1])
```

```
a[9:0:-1] = [8 7 6 5 4 3 2 1]

a[::-1] = [8 7 6 5 4 3 2 1 0]
```

In [8]:
```
b = np.arange(24).reshape(2,3,4)
print('b =\n', b)
```

```
b =
 [[[ 0  1  2  3]
  [ 4  5  6  7]
  [ 8  9 10 11]]

 [[12 13 14 15]
  [16 17 18 19]
  [20 21 22 23]]]
```

In [9]:
```
print('b[1,2,3] =', b[1,2,3], '\n')

print('b[0,2,2] =', b[0,2,2], '\n')

print('b[0,1,1] =', b[0,1,1])
```

```
b[1,2,3] = 23

b[0,2,2] = 10

b[0,1,1] = 5
```

In [12]:
```
print('b[0,0,0] =', b[0,0,0], '\n')


print('b[1,0,0] =', b[1,0,0], '\n')


print('b[:,0,0] =', b[:,0,0])
```

```
b[0,0,0] = 0

b[1,0,0] = 12

b[:,0,0] = [ 0 12]
```

In [13]:
```
print('b[0] =\n', b[0])
```

```
b[0] =
 [[ 0  1  2  3]
 [ 4  5  6  7]
 [ 8  9 10 11]]
```

In [14]:
```
print('b[0,:,:] =\n', b[0,:,:])
```

```
b[0,:,:] =
 [[ 0  1  2  3]
 [ 4  5  6  7]
 [ 8  9 10 11]]
```

In [15]:
```
print('b[0,1] =', b[0,1])
```

```
b[0,1] = [4 5 6 7]
```

In [16]:
```
z = b[0,1]
print('z =', z, '\n')

print('z[::2] =', z[::2])
```

```
z = [4 5 6 7]

z[::2] = [4 6]
```

In [17]:
```
print('b[0,1,::2] =', b[0,1,::2])
```

```
b[0,1,::2] = [4 6]
```

In [18]:
```
print(b, '\n')
print('b[:,:,1] =\n', b[:,:,1], '\n')
print('b[...,1] =\n', b[...,1])
```

```
[[[ 0  1  2  3]
  [ 4  5  6  7]
  [ 8  9 10 11]]

 [[12 13 14 15]
  [16 17 18 19]
  [20 21 22 23]]]

b[:,:,1] =
 [[ 1  5  9]
 [13 17 21]]

b[...,1] =
 [[ 1  5  9]
 [13 17 21]]
```

In [19]:
```
print(b, '\n')
print('b[:,1] =', b[:,1])
```

```
[[[ 0  1  2  3]
  [ 4  5  6  7]
  [ 8  9 10 11]]

 [[12 13 14 15]
  [16 17 18 19]
  [20 21 22 23]]]

b[:,1] = [[ 4  5  6  7]
 [16 17 18 19]]
```

In [20]:
```
print(b, '\n')
print('b[0,:,1] =', b[0,:,1])
```

```
[[[ 0  1  2  3]
  [ 4  5  6  7]
  [ 8  9 10 11]]

 [[12 13 14 15]
  [16 17 18 19]
  [20 21 22 23]]]

b[0,:,1] = [1 5 9]
```

In [21]:
```
print('b[0,:,-1] =', b[0,:,-1])

print('b[0, ::-1, -1] =', b[0, ::-1, -1])

print('b[0, ::2, -1] =', b[0, ::2, -1])
```

```
b[0,:,-1] = [ 3  7 11]
b[0, ::-1, -1] = [11  7  3]
b[0, ::2, -1] = [ 3 11]
```

In [22]:
```
print(b, '\n----------------------\n')

print(b[::-1])
```

```
[[[ 0  1  2  3]
  [ 4  5  6  7]
  [ 8  9 10 11]]

 [[12 13 14 15]
  [16 17 18 19]
  [20 21 22 23]]]
----------------------

[[[12 13 14 15]
  [16 17 18 19]
  [20 21 22 23]]

 [[ 0  1  2  3]
  [ 4  5  6  7]
  [ 8  9 10 11]]]
```

In [23]:
```
print('Matriz b =\n', b, '\n-------------------------\n')

print('Vector b = \n', b.ravel())
```

```
Matriz b =
 [[[ 0  1  2  3]
  [ 4  5  6  7]
  [ 8  9 10 11]]

 [[12 13 14 15]
  [16 17 18 19]
  [20 21 22 23]]]
-------------------------

Vector b =
 [ 0  1  2  3  4  5  6  7  8  9 10 11 12 13 14 15 16 17 18 19 20 21 22 23]
```

In [24]:
```
print('Vector b con flatten =\n', b.flatten())
```

```
Vector b con flatten =
 [ 0  1  2  3  4  5  6  7  8  9 10 11 12 13 14 15 16 17 18 19 20 21 22 23]
```

In [25]:
```
b.shape = (6,4)
print('b(6x4) =\n', b)
```

```
b(6x4) =
 [[ 0  1  2  3]
 [ 4  5  6  7]
 [ 8  9 10 11]
 [12 13 14 15]
 [16 17 18 19]
 [20 21 22 23]]
```

In [26]:
```
print('b =\n', b, '\n------------------------\n')
# Matri transpuesta
print('Transpuesta de b =\n', b.transpose(), '\n------------------------\n')
```

```
b =
 [[ 0  1  2  3]
 [ 4  5  6  7]
 [ 8  9 10 11]
 [12 13 14 15]
 [16 17 18 19]
 [20 21 22 23]]
------------------------

Transpuesta de b =
 [[ 0  4  8 12 16 20]
 [ 1  5  9 13 17 21]
 [ 2  6 10 14 18 22]
 [ 3  7 11 15 19 23]]
------------------------
```

In [27]:
```
b.resize([2,12])

print('b =\n', b)
```

```
b =
 [[ 0  1  2  3  4  5  6  7  8  9 10 11]
 [12 13 14 15 16 17 18 19 20 21 22 23]]
```