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

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

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

In [3]:
```
import sys
sys.version
```

Out[3]:
```
'3.12.4 | packaged by Anaconda, Inc. | (main, Jun 18 2024, 15:03:56) [MSC v.192
9 64 bit (AMD64)]'
```

Creating array

In [5]:
```
my_list=[0,1,2,3,4,5]
my_list
```

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

In [6]:
```
type(my_list)
```

Out[6]:
```
list
```

In [7]:
```
arr=np.array(my_list)
```

In [8]:
```
arr
```

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

In [9]:
```
type(arr)
```

Out[9]:
```
numpy.ndarray
```

In [10]:
```
type(my_list)
```

Out[10]:
```
list
```

In [11]:
```
np.arange(5)
```

Out[11]:
```
array([0, 1, 2, 3, 4])
```

In [12]:
```
np.arange(3.0)
```

Out[12]:
```
array([0., 1., 2.])
```

In [13]:
```
np.arange(10)
```

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

In [14]:
```
np.arange(0,5)
```

Out[14]:
```
array([0, 1, 2, 3, 4])
```

In [15]:
```
np.arange(10,20)
```

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

In [16]:
```
np.arange(20,10)
```

Out[16]:
```
array([], dtype=int32)
```

In [17]:
```
np.arange(-20,10)
```

Out[17]:
```
array([-20, -19, -18, -17, -16, -15, -14, -13, -12, -11, -10,  -9,  -8,
        -7,  -6,  -5,  -4,  -3,  -2,  -1,   0,   1,   2,   3,   4,   5,
         6,   7,   8,   9])
```

In [18]:
```
np.arange(-16,10)
```

Out[18]:
```
array([-16, -15, -14, -13, -12, -11, -10,  -9,  -8,  -7,  -6,  -5,  -4,
        -3,  -2,  -1,   0,   1,   2,   3,   4,   5,   6,   7,   8,   9])
```

In [19]:
```
np.arange(-20,-10)
```

Out[19]:
```
array([-20, -19, -18, -17, -16, -15, -14, -13, -12, -11])
```

In [20]:
```
np.arange(30,20)
```

Out[20]:
```
array([], dtype=int32)
```

In [21]:
```
np.arange(-30,20)
```

Out[21]:
```
array([-30, -29, -28, -27, -26, -25, -24, -23, -22, -21, -20, -19, -18,
       -17, -16, -15, -14, -13, -12, -11, -10,  -9,  -8,  -7,  -6,  -5,
        -4,  -3,  -2,  -1,   0,   1,   2,   3,   4,   5,   6,   7,   8,
         9,  10,  11,  12,  13,  14,  15,  16,  17,  18,  19])
```

In [22]:
```
np.arange(10,10)
```

Out[22]:
```
array([], dtype=int32)
```

In [23]:
```
np.arange(-20,20)
```

Out[23]:
```
array([-20, -19, -18, -17, -16, -15, -14, -13, -12, -11, -10,  -9,  -8,
        -7,  -6,  -5,  -4,  -3,  -2,  -1,   0,   1,   2,   3,   4,   5,
         6,   7,   8,   9,  10,  11,  12,  13,  14,  15,  16,  17,  18,
        19])
```

In [24]:
```
np.arange(10,30,5)
```

Out[24]:
```
array([10, 15, 20, 25])
```

In [25]:
```
np.arange(0,10,3)
```

Out[25]:
```
array([0, 3, 6, 9])
```

In [26]:
```
np.zeros(3)
```

Out[26]:
```
array([0., 0., 0.])
```

In [27]:
```
np.zeros(5,dtype=int)
```

Out[27]:
```
array([0, 0, 0, 0, 0])
```

In [28]:
```
np.zeros((2,2),dtype=int)
```

Out[28]:
```
array([[0, 0],
       [0, 0]])
```

In [29]:
```
zero=np.zeros([2,2])
print(zero)
```

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

In [30]:
```
np.zeros((2,10))
```

Out[30]:
```
array([[0., 0., 0., 0., 0., 0., 0., 0., 0., 0.],
       [0., 0., 0., 0., 0., 0., 0., 0., 0., 0.]])
```

In [31]:
```
n=(6,7)
n1=(6,8)
print(np.zeros(n))
```

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

In [32]:
```
np.ones(3,dtype=int)
```

Out[32]:
```
array([1, 1, 1])
```

In [33]:
```
np.ones(4)
```

Out[33]:
```
array([1., 1., 1., 1.])
```

In [34]:
```
n
```

Out[34]:
```
(6, 7)
```

In [35]:
```
np.ones(n)
```

Out[35]:
```
array([[1., 1., 1., 1., 1., 1., 1.],
       [1., 1., 1., 1., 1., 1., 1.],
       [1., 1., 1., 1., 1., 1., 1.],
       [1., 1., 1., 1., 1., 1., 1.],
       [1., 1., 1., 1., 1., 1., 1.],
       [1., 1., 1., 1., 1., 1., 1.]])
```

In [36]:
```
np.ones((5,4),dtype=int)
```

Out[36]:
```
array([[1, 1, 1, 1],
       [1, 1, 1, 1],
       [1, 1, 1, 1],
       [1, 1, 1, 1],
       [1, 1, 1, 1]])
```

In [37]:
```
np.ones((2,4))
```

Out[37]:
```
array([[1., 1., 1., 1.],
       [1., 1., 1., 1.]])
```

In [38]:
```
np.ones((6,10),dtype=int)
```

Out[38]:
```
array([[1, 1, 1, 1, 1, 1, 1, 1, 1, 1],
       [1, 1, 1, 1, 1, 1, 1, 1, 1, 1],
       [1, 1, 1, 1, 1, 1, 1, 1, 1, 1],
       [1, 1, 1, 1, 1, 1, 1, 1, 1, 1],
       [1, 1, 1, 1, 1, 1, 1, 1, 1, 1],
       [1, 1, 1, 1, 1, 1, 1, 1, 1, 1]])
```

In [39]:
```
from numpy import *
```

In [40]:
```
arange(3)
```

Out[40]:
```
array([0, 1, 2])
```

range(12) list(range(12))

In [41]:
```
y=list(range(12))
y
```

Out[41]:
```
[0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11]
```

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