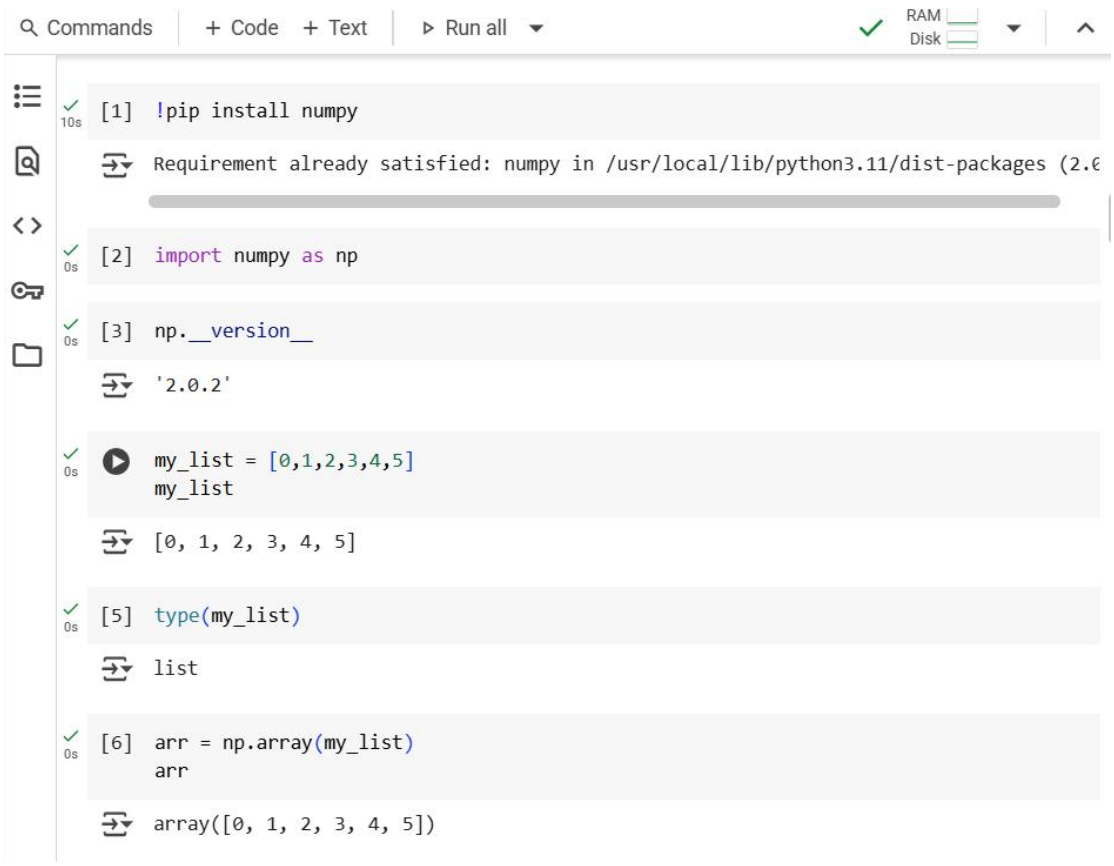
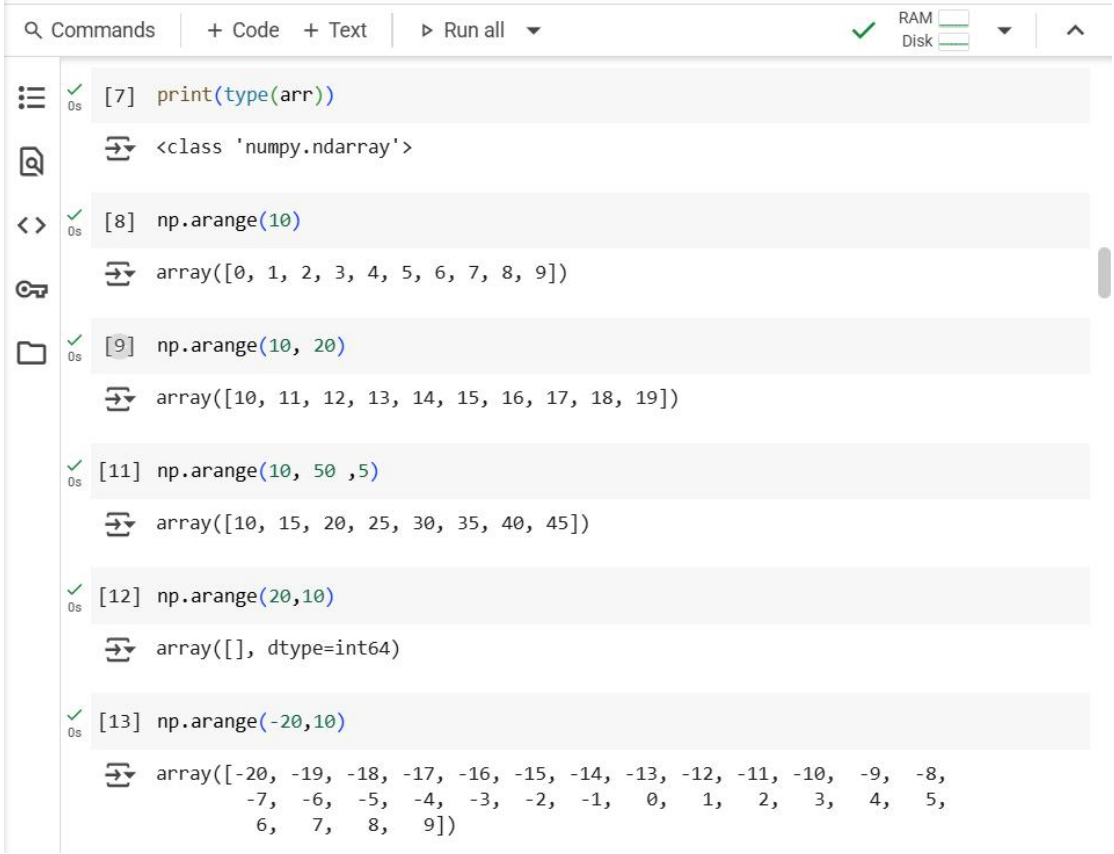
Numpy



```
[1] !pip install numpy
Requirement already satisfied: numpy in /usr/local/lib/python3.11/dist-packages (2.0
[2] import numpy as np
[3] np.__version__
'2.0.2'
[4] my_list = [0,1,2,3,4,5]
    my_list
[0, 1, 2, 3, 4, 5]
[5] type(my_list)
list
[6] arr = np.array(my_list)
    arr
array([0, 1, 2, 3, 4, 5])
```



```
[7] print(type(arr))
<class 'numpy.ndarray'>
[8] np.arange(10)
array([0, 1, 2, 3, 4, 5, 6, 7, 8, 9])
[9] np.arange(10, 20)
array([10, 11, 12, 13, 14, 15, 16, 17, 18, 19])
[11] np.arange(10, 50 ,5)
array([10, 15, 20, 25, 30, 35, 40, 45])
[12] np.arange(20,10)
array([], dtype=int64)
[13] np.arange(-20,10)
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])
```

```
np.zeros(5)#Parameter tunning
```

```
array([0., 0., 0., 0., 0.])
```

```
[15] np.zeros(5, dtype=int)#hyperParamter tunning
```

```
array([0, 0, 0, 0, 0])
```

```
[16] np.zeros([2,2])
```

```
array([[0., 0.],
       [0., 0.]])
```

```
[17] np.zeros([5,4])
```

```
array([[0., 0., 0., 0.],
       [0., 0., 0., 0.],
       [0., 0., 0., 0.],
       [0., 0., 0., 0.],
       [0., 0., 0., 0.]])
```

```
[73] #np.array([2,10])  2 represent row and 10 represent columns
```

```
[74] np.zeros(5, dtype=int)
```

```
array([0, 0, 0, 0, 0])
```

```
[18] np.ones(2)
```

```
array([1., 1.])
```

```
[19] np.ones(2 , dtype=int)
```

```
array([1, 1])
```

```
[21] np.ones([2,2])
```

```
array([[1., 1.],
       [1., 1.]])
```

```
[24] np.ones([4,5])
```

```
array([[1., 1., 1., 1., 1.],
       [1., 1., 1., 1., 1.],
       [1., 1., 1., 1., 1.],
       [1., 1., 1., 1., 1.]])
```

```
[23] np.ones([4,5],dtype=int)
```

```
array([[1, 1, 1, 1, 1],
       [1, 1, 1, 1, 1],
       [1, 1, 1, 1, 1],
       [1, 1, 1, 1, 1]])
```

```
[29] np.random.rand(3,2)
```

```
array([[0.39529405, 0.65481119],
       [0.90339623, 0.416655  ],
       [0.72552369, 0.65168274]])
```

```
[30] np.random.rand(3)
```

```
array([0.52400598, 0.28278002, 0.79097205])
```

```
[37] np.random.randint(4,6)
```

```
4
```

```
[45] np.random.randint(0,10)
```

```
4
```

```
[47] np.random.randint(0,10,4)
```

```
array([5, 7, 1, 2])
```

```
[48] np.random.randint(0,10,5)
```

```
array([0, 7, 2, 5, 7])
```

```
[51] n= np.random.randint(10,40,(10,10))
     n
```

```
array([[22, 24, 38, 21, 27, 18, 25, 37, 30, 18],
       [32, 10, 13, 24, 39, 22, 14, 24, 17, 23],
       [31, 30, 39, 31, 30, 37, 26, 14, 34, 37],
       [23, 21, 17, 12, 36, 23, 35, 16, 27, 10],
       [10, 11, 29, 19, 27, 26, 22, 12, 34, 36],
       [12, 23, 33, 12, 39, 32, 17, 33, 13, 37],
       [34, 20, 36, 12, 25, 28, 23, 29, 20, 29],
       [34, 20, 36, 28, 39, 36, 34, 15, 33, 15],
       [10, 24, 14, 26, 21, 16, 26, 32, 36, 14],
       [23, 38, 21, 12, 30, 25, 35, 13, 23, 37]])
```

```
[52] n[0]
```

```
array([22, 24, 38, 21, 27, 18, 25, 37, 30, 18])
```

```
[53] n[5]
```

```
array([12, 23, 33, 12, 39, 32, 17, 33, 13, 37])
```

```
[55] n[0:6]
```

```
array([[22, 24, 38, 21, 27, 18, 25, 37, 30, 18],
       [32, 10, 13, 24, 39, 22, 14, 24, 17, 23],
       [31, 30, 39, 31, 30, 37, 26, 14, 34, 37],
       [23, 21, 17, 12, 36, 23, 35, 16, 27, 10],
       [10, 11, 29, 19, 27, 26, 22, 12, 34, 36],
       [12, 23, 33, 12, 39, 32, 17, 33, 13, 37]])
```

```
[56] n[::-1]#reverse the matrix
```

```
array([[23, 38, 21, 12, 30, 25, 35, 13, 23, 37],
       [10, 24, 14, 26, 21, 16, 26, 32, 36, 14],
       [34, 20, 36, 28, 39, 36, 34, 15, 33, 15],
       [34, 20, 36, 12, 25, 28, 23, 29, 20, 29],
       [12, 23, 33, 12, 39, 32, 17, 33, 13, 37],
       [10, 11, 29, 19, 27, 26, 22, 12, 34, 36],
       [23, 21, 17, 12, 36, 23, 35, 16, 27, 10],
       [31, 30, 39, 31, 30, 37, 26, 14, 34, 37],
       [32, 10, 13, 24, 39, 22, 14, 24, 17, 23],
       [22, 24, 38, 21, 27, 18, 25, 37, 30, 18]])
```

```
[57] n[::1]#forward matrix
```

```
array([[22, 24, 38, 21, 27, 18, 25, 37, 30, 18],
       [32, 10, 13, 24, 39, 22, 14, 24, 17, 23],
       [31, 30, 39, 31, 30, 37, 26, 14, 34, 37],
       [23, 21, 17, 12, 36, 23, 35, 16, 27, 10],
       [10, 11, 29, 19, 27, 26, 22, 12, 34, 36],
       [12, 23, 33, 12, 39, 32, 17, 33, 13, 37],
       [34, 20, 36, 12, 25, 28, 23, 29, 20, 29],
       [34, 20, 36, 28, 39, 36, 34, 15, 33, 15],
       [10, 24, 14, 26, 21, 16, 26, 32, 36, 14],
       [23, 38, 21, 12, 30, 25, 35, 13, 23, 37]])
```

```
[58] n[::2]
```

```
array([[22, 24, 38, 21, 27, 18, 25, 37, 30, 18],
       [31, 30, 39, 31, 30, 37, 26, 14, 34, 37],
       [10, 11, 29, 19, 27, 26, 22, 12, 34, 36],
       [34, 20, 36, 12, 25, 28, 23, 29, 20, 29],
       [10, 24, 14, 26, 21, 16, 26, 32, 36, 14]])
```

```
[59] n[0]
```

```
array([22, 24, 38, 21, 27, 18, 25, 37, 30, 18])
```

```
[61] n[0:5]#print record
```

```
array([[22, 24, 38, 21, 27, 18, 25, 37, 30, 18],
       [32, 10, 13, 24, 39, 22, 14, 24, 17, 23],
       [31, 30, 39, 31, 30, 37, 26, 14, 34, 37],
       [23, 21, 17, 12, 36, 23, 35, 16, 27, 10],
       [10, 11, 29, 19, 27, 26, 22, 12, 34, 36]])
```

```
[68] print(n[0,5])
```

```
18
```

```
[64] n
```

```
array([[22, 24, 38, 21, 27, 18, 25, 37, 30, 18],
       [32, 10, 13, 24, 39, 22, 14, 24, 17, 23],
       [31, 30, 39, 31, 30, 37, 26, 14, 34, 37],
       [23, 21, 17, 12, 36, 23, 35, 16, 27, 10],
       [10, 11, 29, 19, 27, 26, 22, 12, 34, 36],
       [12, 23, 33, 12, 39, 32, 17, 33, 13, 37],
       [34, 20, 36, 12, 25, 28, 23, 29, 20, 29],
       [34, 20, 36, 28, 39, 36, 34, 15, 33, 15],
       [10, 24, 14, 26, 21, 16, 26, 32, 36, 14],
       [23, 38, 21, 12, 30, 25, 35, 13, 23, 37]])
```

```
[67] print(n[5,-3])#print the specific position
```

```
33
```

```
[65] np.arange(1,13).reshape(3,4)
```

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

```
[70] np.arange(1,13).reshape(12,1)
```

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

```
np.arange(1,13).reshape(6,2)
```

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