```
import numpy as np
```

Numpy Arrays

```
s=[1,2,3]
```

```
arr=np.array(s)
```

```
type(arr)
```

```
numpy.ndarray
```

```
arr
```

```
array([1, 2, 3])
```

```
my_marks=[[1,2,3],[4,5,6,],[7,8,9]]
```

```
np.array(my_marks)
```

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

```
np.arange(0,10)
```

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

```
np.zeros(3)
```

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

```
np.zeros((2,3))
```

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

```
np.ones((2,4))
```

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

```
np.random.rand(5)
```

```
array([0.9853296 , 0.8705707 , 0.62879701, 0.53249167, 0.65253664])
```

```
np.random.rand(5,5)
```

```
array([[0.525249  , 0.06819305, 0.67718744, 0.426853  , 0.83564075],
       [0.0197767 , 0.22519824, 0.227427  , 0.96100741, 0.27239596],
       [0.87819814, 0.7262591 , 0.74729264, 0.85345673, 0.53166811],
       [0.79635773, 0.26364775, 0.197733  , 0.72425297, 0.44360032],
       [0.05852756, 0.03185043, 0.00322975, 0.79089458, 0.12780987]])
```

```
ran=np.random.randint(0,50,10)
```

```
ran
```

```
array([12, 13, 45, 35, 41, 37, 25, 29, 44, 15])
```

```
ran.max()
```

```
45
```

```
ran.min()
```

```
12
```

Indexing and selection

```
ar=np.arange(0,11)
```

```
ar
```

```
array([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10])
```

```
ar[1]
```

```
1
```

```
for i in ar:
  print(i)
```

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

```
ar[5:8]
```

```
array([5, 6, 7])
```

```
array_2d=np.array([[1,2,3],[4,5,6],[7,8,9]])
```

```
array_2d
```

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

```
array_2d[0][1]
```

```
2
```

```
array_2d[2][1]
```

```
8
```

```
array_2d[0:2,1:2]
```

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

```
arr_2d=np.arange(0,50).reshape(5,10)
```

```
arr_2d
```

```
array([[ 0,  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, 28, 29],
       [30, 31, 32, 33, 34, 35, 36, 37, 38, 39],
       [40, 41, 42, 43, 44, 45, 46, 47, 48, 49]])
```

Numpy Operation

```
#array with array
#array with scalars
#universal array function
```

```
ar=np.arange(0,10)
```

```
ar
```

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

```
ar+ar
```

```
array([ 0,  2,  4,  6,  8, 10, 12, 14, 16, 18])
```

```
ar+100
```

```
array([100, 101, 102, 103, 104, 105, 106, 107, 108, 109])
```

```
np.linspace(0,1,20)
```

```
array([0.        , 0.05263158, 0.10526316, 0.15789474, 0.21052632,
       0.26315789, 0.31578947, 0.36842105, 0.42105263, 0.47368421,
       0.52631579, 0.57894737, 0.63157895, 0.68421053, 0.73684211,
       0.78947368, 0.84210526, 0.89473684, 0.94736842, 1.        ])
```

Double-click (or enter) to edit