Numpy Session

In [1]:
```
pip install numpy
```

```
Requirement already satisfied: numpy in c:\users\muhammad mustafa\anaconda3\lib\site-pac
kages (1.20.3)
Note: you may need to restart the kernel to use updated packages.
```

In [2]:
```
#importing numpy

import numpy as np
```

Creating an array

In [3]:
```
#1-D Array

fruits = np.array(['Apple', 'Banana', 'Orange'])
fruits
```

Out[3]:
```
array(['Apple', 'Banana', 'Orange'], dtype='<U6')
```

In [4]:
```
price = np.array([5,5,5])
price
```

Out[4]:
```
array([5, 5, 5])
```

In [5]:
```
type(fruits)
```

Out[5]:
```
numpy.ndarray
```

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

Out[6]:
```
numpy.ndarray
```

In [7]:
```
len(fruits)
```

Out[7]:
```
3
```

In [8]:
```
len(price)
```

Out[8]:
```
3
```

In [9]:
```
fruits[0:]
```

Out[9]:
```
array(['Apple', 'Banana', 'Orange'], dtype='<U6')
```

In [10]:
```
price.mean()
```

Out[10]:
```
5.0
```

In [11]:
```
np.zeros(6)
```

Out[11]:
```
array([0., 0., 0., 0., 0., 0.])
```

In [12]:
```
np.ones(5)
```

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

In [13]:
```
np.empty(5)
```

Out[13]:
```
array([1., 1., 1., 1., 1.])
```

In [14]:
```
np.arange(10)
```

Out[14]:
```
array([0, 1, 2, 3, 4, 5, 6, 7, 8, 9])
```

In [15]:
```
np.arange(2,20)
```

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

In [16]:
```
np.arange(2,20,1.2)
```

Out[16]:
```
array([ 2. ,  3.2,  4.4,  5.6,  6.8,  8. ,  9.2, 10.4, 11.6, 12.8, 14. ,
       15.2, 16.4, 17.6, 18.8])
```

In [17]:
```
#Line space

np.linspace(1,10, num= 5)
```

Out[17]:
```
array([ 1.  ,  3.25,  5.5 ,  7.75, 10.  ])
```

In [18]:
```
np.ones(3, dtype=np.int8)
```

Out[18]:
```
array([1, 1, 1], dtype=int8)
```

In [19]:
```
np.ones(3, dtype=np.float64)
```

Out[19]:
```
array([1., 1., 1.])
```

Array Functions

In [20]:
```
a = np.array([22,56,32,65,1,84,3,21,56,1,0])
a
```

Out[20]:
```
array([22, 56, 32, 65,  1, 84,  3, 21, 56,  1,  0])
```

In [21]:
```
a.sort()
```

In [22]:
```
a
```

Out[22]:
```
array([ 0,  1,  1,  3, 21, 22, 32, 56, 56, 65, 84])
```

In [23]:
```
b = np.array([22.0,66.3,11.2,44.5,77,1,0.0,4])
b
```

Out[23]:
```
array([22. , 66.3, 11.2, 44.5, 77. ,  1. ,  0. ,  4. ])
```

In [24]:
```
c = np.concatenate((a,b))
c
```

Out[24]:
```
array([ 0. ,  1. ,  1. ,  3. , 21. , 22. , 32. , 56. , 56. , 65. , 84. ,
       22. , 66.3, 11.2, 44.5, 77. ,  1. ,  0. ,  4. ])
```

In [25]:
```
c.sort()
```

In [26]:
```
c
```

Out[26]:
```
array([ 0. ,  0. ,  1. ,  1. ,  1. ,  3. ,  4. , 11.2, 21. , 22. , 22. ,
       32. , 44.5, 56. , 56. , 65. , 66.3, 77. , 84. ])
```

In [48]:
```
#3-D array

a = np.array([
    [[1,2,3],
     [3,4,3]],

    [[5,6,3],
     [7,8,3]],

    [[9,10,3],
     [11,12,3]]
])
a
```

Out[48]:
```
array([[[ 1,  2,  3],
        [ 3,  4,  3]],

       [[ 5,  6,  3],
        [ 7,  8,  3]],
```

```
       [[ 9, 10,  3],
        [11, 12,  3]]])
```

In [45]:
```
a.size
```

Out[45]:
```
18
```

In [46]:
```
a.shape
```

Out[46]:
```
(3, 2, 3)
```

In [39]:
```
#how to find the dimentions
a.ndim
```

Out[39]:
```
3
```

In [41]:
```
a = np.array([[1,2,3],
              [4,5,6],
              [7,8,9]])
a
```

Out[41]:
```
array([[1, 2, 3],
       [4, 5, 6],
       [7, 8, 9]])
```

In [42]:
```
a.ndim
```

Out[42]:
```
2
```

In [43]:
```
a.shape
```

Out[43]:
```
(3, 3)
```

In [53]:
```
a= np.arange(10)
a
```

Out[53]:
```
array([0, 1, 2, 3, 4, 5, 6, 7, 8, 9])
```

In [57]:
```
a.reshape(1,10)
```

Out[57]:
```
array([[0, 1, 2, 3, 4, 5, 6, 7, 8, 9]])
```

In [59]:
```
a = np.arange(9)
a
```

Out[59]:
```
array([0, 1, 2, 3, 4, 5, 6, 7, 8])
```

In [60]:
```
a.shape
```

Out[60]:
```
(9,)
```

In [61]:
```
a.ndim
```

Out[61]:
```
1
```

In [62]:
```
a.size
```

Out[62]:
```
9
```

In [63]:
```
a = a[np.newaxis, : ]
a
```

Out[63]:
```
array([[0, 1, 2, 3, 4, 5, 6, 7, 8]])
```

In [64]:
```
a.ndim
```

Out[64]:
```
2
```

In [65]:
```
a.shape
```

Out[65]:
```
(1, 9)
```

In [66]:
```
a.size
```

Out[66]:
```
9
```

In [67]:
```
a.reshape(3,3)
```

Out[67]:
```
array([[0, 1, 2],
       [3, 4, 5],
       [6, 7, 8]])
```

In [68]:
```
a = np.arange(10)
a
```

Out[68]:
```
array([0, 1, 2, 3, 4, 5, 6, 7, 8, 9])
```

In [69]:
```
a*2
```

Out[69]:
```
array([ 0,  2,  4,  6,  8, 10, 12, 14, 16, 18])
```

In [70]:
```
a+2
```

Out[70]:
```
array([ 2,  3,  4,  5,  6,  7,  8,  9, 10, 11])
```

In [71]:
```
a-2
```

Out[71]:
```
array([-2, -1,  0,  1,  2,  3,  4,  5,  6,  7])
```

In [72]:
```
a/2
```

Out[72]:
```
array([0. , 0.5, 1. , 1.5, 2. , 2.5, 3. , 3.5, 4. , 4.5])
```

In [73]:
```
a.sum()
```

Out[73]:
```
45
```

In [74]:
```
a.mean()
```

Out[74]:
```
4.5
```

In [ ]: