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

CREATING ARRAY

```
In [54]:  array = np.array([1,2,3,4,5,6,7,8])
```

```
In [55]:  print(array)

          [1 2 3 4 5 6 7 8]
```

CREATING MATRIX

```
In [15]:  matrix = np.array([[1,2,3],[4,5,6],[7,8,9]])
```

```
In [16]:  matrix

Out[16]:  array([[1, 2, 3],
                 [4, 5, 6],
                 [7, 8, 9]])
```

TRANSPOSING MATRIX

```
In [20]:  matrix.T

Out[20]:  array([[1, 4, 7],
                 [2, 5, 8],
                 [3, 6, 9]])
```

SQUARE OF NUMBERS

```
In [25]:  #underroot of 25
          square = np.sqrt(25)
```

```
In [26]:  square

Out[26]:  5.0
```

```
In [144…  square1 = np.square(5)
```

```
In [145…  square1

Out[145]:  25
```

ARRANGE NUMBERS

```
In [28]:   arrange = np.arange(1,100)
```

```
In [29]:   arrange
```

```
Out[29]:   array([ 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, 50, 51,
                  52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68,
                  69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85,
                  86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99])
```

LINESPACE

```
In [30]:   linespace = np.linspace(1,10,2)
```

```
In [31]:   linespace
```

```
Out[31]:   array([ 1., 10.])
```

RESHAPING

```
In [57]:   #we do reshping of arrays to shape it into matrix form
           array.reshape(4,2)
```

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

ZEROS

```
In [49]:   zeros = np.zeros([4,4])
```

```
In [42]:   zeros
```

```
Out[42]:   array([[0., 0., 0., 0.],
                  [0., 0., 0., 0.],
                  [0., 0., 0., 0.],
                  [0., 0., 0., 0.]])
```

ONES

```
In [37]:   ones = np.ones([4,5])
```

```
In [38]:   ones
```

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

IDENTITY MATRIX

```
In [46]:   ident = np.eye(5,4)
```

```
In [47]:   ident
```

```
Out[47]:   array([[1., 0., 0., 0.],
                  [0., 1., 0., 0.],
                  [0., 0., 1., 0.],
                  [0., 0., 0., 1.],
                  [0., 0., 0., 0.]])
```

UNIQUE

```
In [59]:   variable = np.array([1,2,3,4,3,2,1,4,"john","love","got","love","dare"])
```

```
In [60]:   variable
```

```
Out[60]:   array(['1', '2', '3', '4', '3', '2', '1', '4', 'john', 'love', 'got',
                  'love', 'dare'], dtype='<U11')
```

```
In [61]:   np.unique(variable)
```

```
Out[61]:   array(['1', '2', '3', '4', 'dare', 'got', 'john', 'love'], dtype='<U11')
```

mathematical operations of 2 arrays

```
In [62]:   array2 = np.array([4,5,6,7,2,7,4,8])
```

```
In [66]:   array3 = array+array2
```

```
In [67]:   array3
```

```
Out[67]:   array([ 5,  7,  9, 11,  7, 13, 11, 16])
```

```
In [68]:   array4 = array*array2
```

```
In [69]:   array4
```

```
Out[69]:   array([ 4, 10, 18, 28, 10, 42, 28, 64])
```

```
In [70]:   array5 = array-array2
```

```
In [71]:   array5
```

```
Out[71]:    array([-3, -3, -3, -3,  3, -1,  3,  0])
```

```
In [72]:    array6 = array/array2
```

```
In [73]:    array6
```

```
Out[73]:    array([0.25      , 0.4       , 0.5       , 0.57142857, 2.5       ,
                   0.85714286, 1.75      , 1.        ])
```

RANDOM NUMBER

```
In [99]:    random = np.random.randn(4,3)
```

```
In [100…    random
```

```
Out[100]:   array([[ 0.59370083,  0.60530481, -1.33041212],
                   [-0.98346689,  0.27773487, -0.320655  ],
                   [-0.38203357,  0.11154035, -1.64257972],
                   [ 1.67407817,  0.7958533 , -0.32483813]])
```

```
In [135…    random1 = np.random.rand(4,3)
```

```
In [136…    random1
```

```
Out[136]:   array([[0.7637347 , 0.53695018, 0.76529261],
                   [0.72442411, 0.94938854, 0.86412191],
                   [0.44250435, 0.58200207, 0.45114452],
                   [0.43388307, 0.75907833, 0.75648887]])
```

RANDOM NUMBERS GENERATION AND SORTING

```
In [121…    random_number = np.random.randint(10,20, size=10)
```

```
In [127…    random_number
```

```
Out[127]:   array([12, 17, 13, 13, 19, 18, 11, 13, 17, 10])
```

```
In [128…    np.sort(random_number)
```

```
Out[128]:   array([10, 11, 12, 13, 13, 13, 17, 17, 18, 19])
```

```
In [129…    np.max(random)
```

```
Out[129]:   1.6740781665973599
```

```
In [130…    np.min(random)
```

```
Out[130]:   -1.64257972187533
```

```
In [137…    random>random1
```

Out[137]:
```
array([[False,  True, False],
       [False, False, False],
       [False, False, False],
       [ True,  True, False]])
```

In [141…

```python
print(random[random>1])
```

```
[1.67407817]
```