NUMPY

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

Create an arry hich contain first 19 digit

In [ ]:
```
arr=np.arange(20)
```

In [ ]:
```
arr
```

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

In [ ]:
```
arr_1d=np.array([1,2,3,4])
print(arr_1d)
```

```
[1 2 3 4]
```

In [ ]:
```
type(arr_1d)
```

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

In [ ]:
```
arr_1d.ndim
```

Out[ ]:
```
1
```

In [ ]:
```
arr_2d=np.array([[1,2,3,4], [5,6,7,8,]])
print(arr_2d)
```

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

Array Dimension type

In [ ]:
```
arr_2d.ndim
```

Out[ ]:
```
2
```

Array Size

In [ ]:
```
arr_1d.size
```

Out[ ]:
```
4
```

In [ ]:
```
arr_2d.size
```

Out[ ]:
```
8
```

Array Shape which tells us Rows & Columns

we 2 rows & 4 Columns

In [ ]:
```
arr_2d.shape
```

Out[ ]:
```
(2, 4)
```

dtype(int 32) tells us about data type which is int and saved in 32 bits

In [ ]:
```
arr_2d.dtype
```

Out[ ]:
```
dtype('int32')
```

In [ ]:
```
arr_2d
```

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

In [ ]:
```
arr_3d=np.array([[1,1,1], [1,1,1],[1,0,1]])
arr_3d
```

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

In [ ]:
```
mx_1s =np.ones(5)
mx_1s
```

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

In [ ]:
```
mx_1s.dtype
```

Out[ ]:
```
dtype('float64')
```

In [ ]:
```
mx_2s = np.ones((3,4))
print(mx_2s)
```

```
[[1. 1. 1. 1.]
 [1. 1. 1. 1.]
 [1. 1. 1. 1.]]
```

In [ ]:
```
mx_1s = np.ones((3,4), dtype = int )
mx_1s
```

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

In [ ]:
```
mx_0s=np.zeros((4,6),)
mx_0s
```

Out[ ]:
```
array([[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 [ ]:
```
mx_0s = np.zeros((4,6), dtype= bool)
mx_0s
```

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

In [ ]:
```
mx_0s = np.zeros((4,6), dtype= str)
mx_0s
```

Out[ ]:
```
array([['', '', '', '', '', ''],
       ['', '', '', '', '', ''],
       ['', '', '', '', '', ''],
       ['', '', '', '', '', '']], dtype='<U1')
```

In [ ]:
```
mx_0s = np.empty((3,3))
mx_0s
```

Out[ ]:
```
array([[0.00000000e+000, 0.00000000e+000, 0.00000000e+000],
       [0.00000000e+000, 0.00000000e+000, 5.79044937e-321],
       [6.23041391e-307, 1.60219034e-306, 1.89145199e-307]])
```

In [ ]:
```

```