IMPORT NUMPY AS NP

```
import numpy as npp
```

CREATE AN ARRAY OF 10 ZEROS

```
z1=np.zeros(10)
z1
```

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

CREATE AN ARRAY OF 10 ONES

```
z=np.ones(10)
z
```

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

CREATE AN ARRAY OF 10 FIVES

```
z3=np.full(10,5.0)
z3
```

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

CREATE AN ARRAY OF THE INTEGERS FROM 10 TO 50

```
a=np.arange(10,51)
a
```

```
array([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])
```

CREATE AN ARRAY OF ALL THE EVEN INTEGERS FROM 10 TO 50

```
'''
el=[]
for i in a:
 if i%2==0:
 el.append(i)
el_arr=np.array(el)
el_arr
'''
ev_arr=np.arange(10,51,2)
ev_arr
```

```
array([10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42,
       44, 46, 48, 50])
```

CREATE A 3*3 MATRIX WITH VALUES RANGING FROM 0 TO 8

```
a1=np.array([[0,1,2,],[3,4,5],[6,7,8]])
a1
```

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

CREATE A 3*3 MATRIX:

```
a2=np.eye(3)
a2
```

```
array([[1., 0., 0.],
       [0., 1., 0.],
       [0., 0., 1.]])
```

USE NUMPY TO GENERATE A RANDOM NUMBER 0 AND 1

```
ran_num=np.random.rand()
ran_num
```

```
0.33976129970391267
```

USE NUMPY TO GENERATE AN ARRAY OF 25 RANDOM NUMBERS SAMPLED FROM A STANDARD NORMAL DISTRIBUTION

```
a=np.random.randn(25)
a
```

```
array([ 2.29972753,  1.08467021, -0.0498012 ,  1.56444824,  1.56864011,
        0.55742889,  1.05025396,  0.66362214,  0.17776337, -0.41836751,
        0.68120381,  1.26437155,  0.71104617,  0.5051893 ,  0.04243004,
       -0.90339578, -0.22982411,  0.02182604, -2.04922841,  1.06311063,
        1.30853256,  0.71184502,  0.855479  , -0.73288403,  0.02140999])
```

CREATE THE FOOLOWING MATRIX:

```
ar=np.arange(0.01,1.0,0.01)
ar
```

```
array([0.01, 0.02, 0.03, 0.04, 0.05, 0.06, 0.07, 0.08, 0.09, 0.1 , 0.11,
       0.12, 0.13, 0.14, 0.15, 0.16, 0.17, 0.18, 0.19, 0.2 , 0.21, 0.22,
       0.23, 0.24, 0.25, 0.26, 0.27, 0.28, 0.29, 0.3 , 0.31, 0.32, 0.33,
       0.34, 0.35, 0.36, 0.37, 0.38, 0.39, 0.4 , 0.41, 0.42, 0.43, 0.44,
       0.45, 0.46, 0.47, 0.48, 0.49, 0.5 , 0.51, 0.52, 0.53, 0.54, 0.55,
       0.56, 0.57, 0.58, 0.59, 0.6 , 0.61, 0.62, 0.63, 0.64, 0.65, 0.66,
       0.67, 0.68, 0.69, 0.7 , 0.71, 0.72, 0.73, 0.74, 0.75, 0.76, 0.77,
       0.78, 0.79, 0.8 , 0.81, 0.82, 0.83, 0.84, 0.85, 0.86, 0.87, 0.88,
       0.89, 0.9 , 0.91, 0.92, 0.93, 0.94, 0.95, 0.96, 0.97, 0.98, 0.99])
```

CREATE AN ARRAY OF 20 LINEARLY SPACED POINTS BETWEEN 0 AND 1:

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

```
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.        ])
```

NUMPY INDEXING AND SELECTION

NOW YOU WILL BE GIVEN A FEW MATRICES, AND BE ASKED TO REPLICATE THE RESULTING MATRIX OUTPUTS:

```
mat = np.arange(1,26).reshape(5,5)
mat
```

```
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]])
```

```
mat[2:6,1:6]
```

```
array([[12, 13, 14, 15],
       [17, 18, 19, 20],
       [22, 23, 24, 25]])
```

```
mat[3:4,4:6]
```

```
array([[20]])
```

```
mat[0:3,1:2]
```

```
array([[ 2],
       [ 7],
       [12]])
```

```
mat[4:6,0:6]
```

```
array([[21, 22, 23, 24, 25]])
```

```
mat[3:6,0:6]
```

```
array([[16, 17, 18, 19, 20],
       [21, 22, 23, 24, 25]])
```

NOW DO THE FOLLOWING

GET THE SUM OF ALL THE VALUES IN MAT

```
sum1=np.sum(mat)
sum1
```

```
325
```

GET THE STANDARD DEVIATION OF THE VALUES IN MAT

```
sd=np.std(mat)
sd
```

```
7.211102550927978
```

GET THE SUM OF ALL THE COLUMNS IN MAT

```
col_sum=np.sum(mat,axis=0)
col_sum
```

```
array([55, 60, 65, 70, 75])
```

✓ 0s completed at 8:12 PM