In [2]:
```
!pip install numpy
```

```
Requirement already satisfied: numpy in c:\users\sgowt\appdata\local\programs\python\python311\lib\site-packages (1.25.2)
```

In [4]:
```
import numpy as np
```

In [5]:
```
np.zeros(10)
```

Out[5]:
```
array([0., 0., 0., 0., 0., 0., 0., 0., 0., 0.])
```

In [6]:
```
np.ones(10)
```

Out[6]:
```
array([1., 1., 1., 1., 1., 1., 1., 1., 1., 1.])
```

In [7]:
```
np.ones(10) * 5
```

Out[7]:
```
array([5., 5., 5., 5., 5., 5., 5., 5., 5., 5.])
```

In [10]:
```
np.arange(10,51)
```

Out[10]:
```
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])
```

In [11]:
```
print(np.arange(10,51,2))
```

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

In [12]:
```
np.arange(0,9).reshape((3,3))
```

Out[12]:
```
array([[0, 1, 2],
       [3, 4, 5],
       [6, 7, 8]])
```

In [13]:
```
np.eye(3)
```

Out[13]:
```
array([[1., 0., 0.],
       [0., 1., 0.],
       [0., 0., 1.]])
```

In [14]:
```
np. random.randint(0,1)
```

Out[14]:
```
0
```

In [18]:
```
np. random.randn(25)
```

Out[18]:
```
array([-1.43266297, -0.19310224, -1.09359597, -0.36052787, -0.52308943,
        0.17679308,  0.42116714, -1.5599857 ,  0.82563568, -0.51315516,
        0.28017429, -0.12525103,  0.38101618, -0.19110205,  1.94957908,
       -0.94855045,  0.63663277, -0.90163271, -0.38834815,  0.85899223,
        1.47658557,  1.25506709,  1.0717026 ,  0.37439866, -1.53226905])
```

In [19]:
```
np.arange(1,101).reshape(10,10)/100
```

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

In [20]:
```
np.linspace(0,1,20)
```

Out[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.        ])
```

In [22]:
```
mat = np.arange(1,26).reshape(5,5)
mat
```

Out[22]:
```
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]])
```

In [23]:
```
mat[2:,1:]
```

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

In [24]:
```
mat[3,4]
```

Out[24]:
```
20
```

In [25]:
```
mat[:3,1:2]
```

Out[25]:
```
array([[ 2],
       [ 7],
       [12]])
```

In [27]:
```
mat[4,:]
```

Out[27]:
```
array([21, 22, 23, 24, 25])
```

In [28]:
```
mat[3:5,:]
```

Out[28]:
```
array([[16, 17, 18, 19, 20],
       [21, 22, 23, 24, 25]])
```

In [29]:
```
mat.sum()
```

Out[29]:
```
325
```

In [30]:
```
mat.std()
```

Out[30]:
```
7.211102550927978
```

In [31]:
```
mat.sum(axis=0)
```

Out[31]: array([55, 60, 65, 70, 75])

In [ ]: