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

arr = np.array([1, 2, 3, 4, 5])
print(arr)
print("Mean:", np.mean(arr))
print("Square roots:", np.sqrt(arr))
```

```
[1 2 3 4 5]
Mean: 3.0
Square roots: [1.         1.41421356 1.73205081 2.         2.23606798]
```

In [2]:
```
import numpy as np

Z = np.arange(10, 50)
print(Z)
```

```
[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]
```

In [3]:
```
import numpy as np


Z = np.ones((3,3))
print("Original array:\n", Z)


Z = np.pad(Z, pad_width=1, mode='constant', constant_values=0)
print("\nArray with border:\n", Z)
```

```
Original array:
 [[1. 1. 1.]
 [1. 1. 1.]
 [1. 1. 1.]]

Array with border:
 [[0. 0. 0. 0. 0.]
 [0. 1. 1. 1. 0.]
 [0. 1. 1. 1. 0.]
 [0. 1. 1. 1. 0.]
 [0. 0. 0. 0. 0.]]
```

In [5]:
```
Z = np.arange(9).reshape(3,3)
print( Z)
```

```
[[0 1 2]
 [3 4 5]
 [6 7 8]]
```

In [6]:
```
Z = np.arange(50)
Z = Z[::-1]
print( Z)
```

```
[49 48 47 46 45 44 43 42 41 40 39 38 37 36 35 34 33 32 31 30 29 28 27 26
 25 24 23 22 21 20 19 18 17 16 15 14 13 12 11 10  9  8  7  6  5  4  3  2
  1  0]
```

In [7]:
```
nz = np.nonzero([1,2,0,0,4,0])
print( nz)
```

```
(array([0, 1, 4], dtype=int64),)
```

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```
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```
Original array:
 [[1. 1. 1.]
 [1. 1. 1.]
 [1. 1. 1.]]

Array with border:
 [[0. 0. 0. 0. 0.]
 [0. 1. 1. 1. 0.]
 [0. 1. 1. 1. 0.]
 [0. 1. 1. 1. 0.]
 [0. 0. 0. 0. 0.]]
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[49 48 47 46 45 44 43 42 41 40 39 38 37 36 35 34 33 32 31 30 29 28 27 26
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  1  0]
```

In [7]:
```
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print( nz)
```

```
(array([0, 1, 4], dtype=int64),)
```

In [8]:
```
Z = np.eye(3)
print( Z)
```

```
[[1. 0. 0.]
 [0. 1. 0.]
 [0. 0. 1.]]
```

In [9]:
```
Z = np.random.random((3,3,3))
print( Z)
```

```
[[[0.51042027 0.00626724 0.84184044]
  [0.50823905 0.6476084  0.04632403]
  [0.90758102 0.17643968 0.47859637]]

 [[0.81098036 0.7148951  0.54853987]
  [0.1061862  0.15311127 0.42327434]
  [0.9421769  0.34977502 0.91190633]]

 [[0.9094929  0.99662785 0.24998404]
  [0.10361562 0.42501842 0.64320848]
  [0.54433761 0.35532098 0.16813704]]]
```

In [10]:
```
Z = np.random.random((10,10))
Zmin, Zmax = Z.min(), Z.max()
print("min =", Zmin, " max =", Zmax)
```

```
min = 0.0029713837728113646  max = 0.996259473429489
```

In [11]:
```
Z = np.random.random(30)
m = Z.mean()
print("mean =", m)
```

```
mean = 0.3589454492301137
```

In [12]:
```
Z = np.ones((10,10))
Z[1:-1,1:-1] = 0
print(Z)
```

```
[[1. 1. 1. 1. 1. 1. 1. 1. 1. 1.]
 [1. 0. 0. 0. 0. 0. 0. 0. 0. 1.]
 [1. 0. 0. 0. 0. 0. 0. 0. 0. 1.]
 [1. 0. 0. 0. 0. 0. 0. 0. 0. 1.]
 [1. 0. 0. 0. 0. 0. 0. 0. 0. 1.]
 [1. 0. 0. 0. 0. 0. 0. 0. 0. 1.]
 [1. 0. 0. 0. 0. 0. 0. 0. 0. 1.]
 [1. 0. 0. 0. 0. 0. 0. 0. 0. 1.]
 [1. 0. 0. 0. 0. 0. 0. 0. 0. 1.]
 [1. 1. 1. 1. 1. 1. 1. 1. 1. 1.]]
```