In [5]:
```
import numpy as np
```

In [2]:
```
rand(4)
```

```
---------------------------------------------------------------------------
NameError                                 Traceback (most recent call last)
Cell In[2], line 1
----> 1 rand(4)

NameError: name 'rand' is not defined
```

In [ ]:
```

```

In [ ]:
```
np.random.rand(4)
```

In [ ]:
```
np.random.rand(3,2)
```

In [ ]:
```
np.random.randint(0,6)
```

In [ ]:
```
np.random.randint(3,20,3)
```

In [7]:
```
np.random.randint(10,40,(10,10))
```

Out[7]:
```
array([[27, 13, 29, 17, 36, 28, 27, 17, 11, 24],
       [24, 26, 39, 17, 30, 12, 29, 11, 21, 13],
       [29, 12, 17, 19, 32, 17, 38, 20, 29, 25],
       [33, 13, 39, 22, 30, 32, 25, 27, 26, 34],
       [36, 22, 12, 39, 17, 27, 34, 35, 29, 10],
       [26, 12, 36, 17, 25, 34, 39, 21, 34, 39],
       [38, 34, 38, 19, 24, 38, 36, 13, 21, 11],
       [19, 32, 13, 25, 24, 17, 29, 11, 29, 28],
       [25, 18, 31, 17, 29, 29, 28, 30, 18, 20],
       [29, 17, 38, 19, 27, 23, 21, 13, 12, 11]])
```

In [13]:
```
np.random.randint(1,100,(12,12))
```

Out[13]:
```
array([[86, 33, 27, 32, 85, 92, 65, 16, 52, 94, 63, 20],
       [30, 48, 27, 99, 29, 97, 39, 85, 69, 50, 27, 73],
       [14,  8, 50, 36, 88, 10, 42, 51, 70, 70, 70, 88],
       [47, 60,  8,  7, 98, 70, 92, 14, 83, 83, 13,  1],
       [26, 92, 60, 95, 97, 12, 33, 74, 16, 44, 85, 34],
       [84, 63, 29, 25, 67, 49, 76, 50, 72, 16,  5, 88],
       [93, 19, 69, 24, 29, 27, 29, 80, 24, 12, 17, 90],
       [29, 43, 39, 43,  3, 67, 93,  2, 21, 40, 18, 52],
       [ 6,  1, 86, 97, 77, 90, 37, 42, 56,  4,  3, 31],
       [40, 53, 72, 37, 37, 28, 28, 96,  7,  7, 69, 28],
       [ 2, 22, 63, 84, 49, 84, 68, 11, 78, 14, 37,  4],
       [68, 91, 35, 55, 34, 67, 43, 60, 90, 65, 93, 36]])
```

In [17]:
```
np.arange(1,10)
```

Out[17]:
```
array([1, 2, 3, 4, 5, 6, 7, 8, 9])
```

In [21]:
```
np.arange(1,10).reshape(3,3)
```

Out[21]:
```
array([[1, 2, 3],
       [4, 5, 6],
       [7, 8, 9]])
```

In [52]:
```
b = np.random.randint(1,8,(5,8))
```

In [54]:
```
type(b)
```

Out[54]:
```
numpy.ndarray
```

In [56]:
```
b
```

Out[56]:
```
array([[7, 3, 5, 5, 5, 2, 6, 2],
       [4, 4, 4, 7, 5, 4, 1, 4],
       [2, 4, 3, 3, 5, 4, 2, 6],
       [3, 1, 7, 1, 3, 6, 6, 7],
       [3, 5, 7, 6, 3, 4, 5, 1]])
```

In [58]:
```
b[:]
```

Out[58]:
```
array([[7, 3, 5, 5, 5, 2, 6, 2],
       [4, 4, 4, 7, 5, 4, 1, 4],
       [2, 4, 3, 3, 5, 4, 2, 6],
       [3, 1, 7, 1, 3, 6, 6, 7],
       [3, 5, 7, 6, 3, 4, 5, 1]])
```

In [60]:
```
b[1:3]
```

Out[60]:
```
array([[4, 4, 4, 7, 5, 4, 1, 4],
       [2, 4, 3, 3, 5, 4, 2, 6]])
```

In [62]:
```
b
```

Out[62]:
```
array([[7, 3, 5, 5, 5, 2, 6, 2],
       [4, 4, 4, 7, 5, 4, 1, 4],
       [2, 4, 3, 3, 5, 4, 2, 6],
       [3, 1, 7, 1, 3, 6, 6, 7],
       [3, 5, 7, 6, 3, 4, 5, 1]])
```

In [64]:
```
b[0,5]
```

Out[64]:
```
2
```

In [66]:
```
b[0:3]
```

Out[66]:
```
array([[7, 3, 5, 5, 5, 2, 6, 2],
       [4, 4, 4, 7, 5, 4, 1, 4],
       [2, 4, 3, 3, 5, 4, 2, 6]])
```

In [70]:
```
b[4,6]
```

Out[70]:
```
5
```

In [140…
```
arr = np.random.randint(10,20,(8,8))
```

In [86]:
```
a = np.random.randint(10,20,10)
arr = np.random.randint(1,5,7)
arr2 = np.random.randint(1,10,5)
```

In [88]:
```
a
```

Out[88]:
```
array([18, 11, 18, 15, 11, 18, 11, 14, 15, 18])
```

In [96]:
```
arr[::-1]
```

Out[96]:
```
array([[15, 18, 12, 19],
       [16, 19, 12, 13],
       [19, 11, 18, 10],
       [13, 10, 14, 12]])
```

In [98]:
```
arr
```

Out[98]:
```
array([[13, 10, 14, 12],
       [19, 11, 18, 10],
       [16, 19, 12, 13],
       [15, 18, 12, 19]])
```

In [100…
```
arr[::-2]
```

Out[100…
```
array([[15, 18, 12, 19],
       [19, 11, 18, 10]])
```

In [102…
```
arr[0:3]
```

Out[102…
```
array([[13, 10, 14, 12],
       [19, 11, 18, 10],
       [16, 19, 12, 13]])
```

In [106…
```
arr.max()
```

Out[106…
```
19
```

In [108…
```
arr.min()
```

Out[108…
```
10
```

In [110…
```
arr.imag()
```

```
---------------------------------------------------------------------------
TypeError                                 Traceback (most recent call last)
Cell In[110], line 1
----> 1 arr.imag()

TypeError: 'numpy.ndarray' object is not callable
```

In [112…
```
arr
```

Out[112…
```
array([[13, 10, 14, 12],
       [19, 11, 18, 10],
       [16, 19, 12, 13],
       [15, 18, 12, 19]])
```

In [116…
```
arr.reshape(2,8)
```

Out[116…
```
array([[13, 10, 14, 12, 19, 11, 18, 10],
       [16, 19, 12, 13, 15, 18, 12, 19]])
```

In [118…
```
arr
```

Out[118…
```
array([[13, 10, 14, 12],
       [19, 11, 18, 10],
       [16, 19, 12, 13],
       [15, 18, 12, 19]])
```

In [122…
```
arr[:,2]
```

Out[122…
```
array([14, 18, 12, 12])
```

In [134…
```
arr[2:3]
```

Out[134…
```
array([[16, 19, 12, 13]])
```

In [138…
```
arr[1:3,2:3]
```

Out[138…
```
array([[18],
       [12]])
```

In [142…
```
arr
```

Out[142…
```
array([[18, 18, 16, 19, 10, 12, 18, 14],
       [10, 12, 13, 14, 15, 15, 12, 13],
       [15, 12, 17, 17, 15, 18, 16, 14],
       [12, 14, 14, 10, 16, 15, 15, 11],
       [11, 12, 18, 13, 11, 15, 10, 12],
       [18, 13, 11, 15, 16, 15, 15, 10],
       [19, 19, 13, 13, 13, 19, 17, 15],
       [16, 16, 14, 10, 15, 11, 15, 13]])
```

In [178…
```
arr[2:5,3:5]
```

Out[178…
```
array([[17, 15],
       [10, 16],
       [13, 11]])
```

In [ ]: