```
In [1]: s1={1,2,3}
        s2=s1.add(4)
        print(s2)
```

None

```
In [2]: print(s1)
```

{1, 2, 3, 4}

```
In [3]: s1={1,2,3}
        s2={4,5,6}
        print(len(s1+s2))
```

```
---------------------------------------------------------------------------
TypeError                                 Traceback (most recent call last)
Cell In[3], line 3
      1 s1={1,2,3}
      2 s2={4,5,6}
----> 3 print(len(s1+s2))

TypeError: unsupported operand type(s) for +: 'set' and 'set'
```

```
In [4]: s1=set([4,5,(6,7)])
        s1.update([10,11])
        print(s1)
```

{4, 5, 10, 11, (6, 7)}

```
In [6]: t=(1,2,3,4)
        t.append(5,6,7)
        print(len(t))
```

```
---------------------------------------------------------------------------
AttributeError                            Traceback (most recent call last)
Cell In[6], line 2
      1 t=(1,2,3,4)
----> 2 t.append(5,6,7)
      3 print(len(t))

AttributeError: 'tuple' object has no attribute 'append'
```

```
In [7]: t={}
```

```
In [8]: t
```

Out[8]: {}


```
In [9]: t1=(1,2,4,3)
        t2=(1,2,3,4)
        print(t1<t2)
```

False

```
In [10]: t1=(1,2,4,3)
         print(2*t1)

(1, 2, 4, 3, 1, 2, 4, 3)
```

```
In [17]: t1=('check')*3
         type(t1)
```

Out[17]: str

```
In [18]: print(t1)
```

checkcheckcheck

```
In [19]: d={'a':5,'b':10}
         d['a']=15
         print(d)
```

{'a': 15, 'b': 10}

```
In [25]: d={'1':1,'2':2,'3':3}
         del d['1']
         d[1]='10'
         del d[2]
         print(len(d))
```

```
---------------------------------------------------------------------------
KeyError                                  Traceback (most recent call last)
Cell In[25], line 4
      2 del d['1']
      3 d[1]='10'
----> 4 del d[2]
      5 print(len(d))

KeyError: 2
```

```
In [26]: a={}
         a['a']=1
         a['b']=[2,3,4]
         print(a)
```

{'a': 1, 'b': [2, 3, 4]}

```
In [27]: print(4+3%5)
```

7

```
In [28]: 3%5
```

Out[28]: 3

```
In [29]: x=1
         x<<2
```

Out[29]: 4

```python
In [31]:   import numpy as np
```

```python
In [32]:   np.arange(5)
```

```
Out[32]:   array([0, 1, 2, 3, 4])
```

```python
In [36]:   np.zeros((3,3))
```

```
Out[36]:   array([[0., 0., 0.],
                  [0., 0., 0.],
                  [0., 0., 0.]])
```

```python
In [35]:   np.zeros(4)
```

```
Out[35]:   array([0., 0., 0., 0.])
```

```python
In [37]:   np.eye(4)
```

```
Out[37]:   array([[1., 0., 0., 0.],
                  [0., 1., 0., 0.],
                  [0., 0., 1., 0.],
                  [0., 0., 0., 1.]])
```

```python
In [38]:   np.identity(4)
```

```
Out[38]:   array([[1., 0., 0., 0.],
                  [0., 1., 0., 0.],
                  [0., 0., 1., 0.],
                  [0., 0., 0., 1.]])
```

```python
In [39]:   np.arange(1,6)
```

```
Out[39]:   array([1, 2, 3, 4, 5])
```

```python
In [41]:   arr=np.arange(0,100).reshape(10,10)
```

```
Out[41]:   array([[ 0,  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, 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, 51, 52, 53, 54, 55, 56, 57, 58, 59],
                  [60, 61, 62, 63, 64, 65, 66, 67, 68, 69],
                  [70, 71, 72, 73, 74, 75, 76, 77, 78, 79],
                  [80, 81, 82, 83, 84, 85, 86, 87, 88, 89],
                  [90, 91, 92, 93, 94, 95, 96, 97, 98, 99]])
```

```python
In [47]:   arr=np.arange(0,6).reshape(2,3)
```

```python
In [48]:   arr.shape()
```

```
---------------------------------------------------------------------------
TypeError                                 Traceback (most recent call last)
Cell In[48], line 1
----> 1 arr.shape()

TypeError: 'tuple' object is not callable
```

In [49]:
```python
import sys
sys.version
```

Out[49]: '3.13.5 | packaged by Anaconda, Inc. | (main, Jun 12 2025, 16:37:03) [MSC v.1929 6
4 bit (AMD64)]'

In [50]:
```python
np.arange(20,10)
```

Out[50]: array([], dtype=int64)

In [51]:
```python
np.arange(10,20)
```

Out[51]: array([10, 11, 12, 13, 14, 15, 16, 17, 18, 19])

In [52]:
```python
np.zeros(3
        )
```

Out[52]: array([0., 0., 0.])

In [54]:
```python
np.zeros(3,dtype=int)
```

Out[54]: array([0, 0, 0])

In [55]:
```python
np.zeros(3,dtype=bool)
```

Out[55]: array([False, False, False])

In [56]:
```python
np.ones(3)
```

Out[56]: array([1., 1., 1.])

In [57]:
```python
np.ones(4,dtype=int)
```

Out[57]: array([1, 1, 1, 1])

In [58]:
```python
np.ones(4,dtype=bool)
```

Out[58]: array([True, True, True, True])

In [61]:
```python
arr=np.ones(3,dtype=complex)
```

In [62]:
```python
arr
```

Out[62]: array([1.+0.j, 1.+0.j, 1.+0.j])

In [63]:
```python
type(arr)
```

```
Out[63]:  numpy.ndarray

In [66]:  np.zeros((5,5),dtype=int)

Out[66]:  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, 0]])

In [68]:  n=np.ones((4,4),dtype=int)
          print(n)

          [[1 1 1 1]
           [1 1 1 1]
           [1 1 1 1]
           [1 1 1 1]]

In [69]:  np.range(0,5)
```

```
---------------------------------------------------------------------------
AttributeError                            Traceback (most recent call last)
Cell In[69], line 1
----> 1 np.range(0,5)

File ~\anaconda3\Lib\site-packages\numpy\__init__.py:414, in __getattr__(attr)
    411         import numpy.char as char
    412         return char.chararray
--> 414 raise AttributeError("module {!r} has no attribute "
    415                      "{!r}".format(__name__, attr))

AttributeError: module 'numpy' has no attribute 'range'
```

```
In [71]:  r=range(0,6)

In [72]:  for i in r:
              print(i)

          0
          1
          2
          3
          4
          5

In [73]:  list([r])

Out[73]:  [range(0, 6)]

In [75]:  list(range(10))

Out[75]:  [0, 1, 2, 3, 4, 5, 6, 7, 8, 9]

In [76]:  list(range(1,10))
```

```
Out[76]:  [1, 2, 3, 4, 5, 6, 7, 8, 9]

In [77]:  list(range(1,10,2))

Out[77]:  [1, 3, 5, 7, 9]

In [78]:  np.random.rand(5)

Out[78]:  array([0.10052573, 0.07577641, 0.34291301, 0.21915998, 0.49618905])

In [79]:  np.random.rand(1,10)

Out[79]:  array([[0.7471178 , 0.20777129, 0.25272847, 0.62031145, 0.6853669 ,
                  0.8116719 , 0.03602404, 0.27998258, 0.23176934, 0.78538703]])

In [82]:  np.random.randint(-30,20,10)

Out[82]:  array([-28, -25,   5, -11,   3,  -2,   3,   9,  19,  17], dtype=int32)

In [84]:  np.random.randint(10,40,(10,10)).reshape(10,10)

Out[84]:  array([[18, 11, 13, 24, 13, 17, 23, 24, 29, 21],
                 [21, 12, 30, 15, 23, 27, 36, 37, 39, 27],
                 [11, 20, 38, 28, 30, 19, 13, 27, 36, 23],
                 [20, 21, 26, 28, 18, 14, 39, 12, 30, 26],
                 [38, 32, 28, 19, 39, 18, 31, 22, 13, 37],
                 [11, 24, 32, 23, 19, 21, 33, 22, 29, 35],
                 [13, 11, 37, 10, 11, 25, 21, 30, 37, 19],
                 [25, 35, 28, 10, 30, 34, 27, 37, 11, 16],
                 [39, 10, 29, 34, 34, 25, 10, 19, 22, 12],
                 [27, 36, 35, 21, 31, 19, 16, 17, 37, 36]], dtype=int32)

In [85]:  np.random.randint(1,100,(10,10))

Out[85]:  array([[53, 84, 88, 55, 19,  4, 43, 59, 55, 10],
                 [13, 55, 72, 91, 59, 65, 22, 98, 56,  7],
                 [22, 40, 35, 88, 73, 75, 40, 16, 65, 52],
                 [85, 79, 37, 20, 46, 28, 28, 39, 41, 41],
                 [74, 14, 97, 15, 17, 45, 59, 25, 88, 78],
                 [45, 10, 79, 99, 49,  5, 76, 90, 66,  1],
                 [ 8, 53, 84, 44,  7, 53, 30, 75, 56, 51],
                 [36, 43, 88, 22, 37, 10, 14, 82, 32, 15],
                 [42, 87, 52, 17, 38,  1, 14, 31, 67, 20],
                 [91, 22, 82, 52,  9,  8, 52, 92, 72, 49]], dtype=int32)

In [86]:  np.random.randint(1,12).reshape(3,4)

          ---------------------------------------------------------------------------
          AttributeError                            Traceback (most recent call last)
          Cell In[86], line 1
          ----> 1 np.random.randint(1,12).reshape(3,4)

          AttributeError: 'int' object has no attribute 'reshape'
```

```
In [88]: np.arange(0,100).reshape(10,10)

Out[88]: array([[ 0,  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, 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, 51, 52, 53, 54, 55, 56, 57, 58, 59],
                [60, 61, 62, 63, 64, 65, 66, 67, 68, 69],
                [70, 71, 72, 73, 74, 75, 76, 77, 78, 79],
                [80, 81, 82, 83, 84, 85, 86, 87, 88, 89],
                [90, 91, 92, 93, 94, 95, 96, 97, 98, 99]])

In [89]: arr=np.arange(1,13).reshape(3,4)

In [90]: arr

Out[90]: array([[ 1,  2,  3,  4],
                [ 5,  6,  7,  8],
                [ 9, 10, 11, 12]])

In [91]: arr=np.arange(1,13).reshape(12,1)

In [92]: arr

Out[92]: array([[ 1],
                [ 2],
                [ 3],
                [ 4],
                [ 5],
                [ 6],
                [ 7],
                [ 8],
                [ 9],
                [10],
                [11],
                [12]])

In [95]: a=np.arange(0,100).reshape(10,10)
         print(a)

[[ 0  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 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 51 52 53 54 55 56 57 58 59]
 [60 61 62 63 64 65 66 67 68 69]
 [70 71 72 73 74 75 76 77 78 79]
 [80 81 82 83 84 85 86 87 88 89]
 [90 91 92 93 94 95 96 97 98 99]]

In [96]: a[:]
```

```
Out[96]: array([[ 0,  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, 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, 51, 52, 53, 54, 55, 56, 57, 58, 59],
                [60, 61, 62, 63, 64, 65, 66, 67, 68, 69],
                [70, 71, 72, 73, 74, 75, 76, 77, 78, 79],
                [80, 81, 82, 83, 84, 85, 86, 87, 88, 89],
                [90, 91, 92, 93, 94, 95, 96, 97, 98, 99]])
```

In [97]: `a[1:3]`

```
Out[97]: array([[10, 11, 12, 13, 14, 15, 16, 17, 18, 19],
                [20, 21, 22, 23, 24, 25, 26, 27, 28, 29]])
```

In [98]: `a[0:1]`

```
Out[98]: array([[0, 1, 2, 3, 4, 5, 6, 7, 8, 9]])
```

In [99]: `a[0:2]`

```
Out[99]: array([[ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9],
                [10, 11, 12, 13, 14, 15, 16, 17, 18, 19]])
```

In [100… `a[1:2]`

```
Out[100… array([[10, 11, 12, 13, 14, 15, 16, 17, 18, 19]])
```

In [101… `a[2:3]`

```
Out[101… array([[20, 21, 22, 23, 24, 25, 26, 27, 28, 29]])
```

In [102… `a[0:-2]`

```
Out[102… array([[ 0,  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, 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, 51, 52, 53, 54, 55, 56, 57, 58, 59],
                [60, 61, 62, 63, 64, 65, 66, 67, 68, 69],
                [70, 71, 72, 73, 74, 75, 76, 77, 78, 79]])
```

In [103… `a[0:2]`

```
Out[103… array([[ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9],
                [10, 11, 12, 13, 14, 15, 16, 17, 18, 19]])
```

In [104… `a[-5:-3]`

```
Out[104… array([[50, 51, 52, 53, 54, 55, 56, 57, 58, 59],
                [60, 61, 62, 63, 64, 65, 66, 67, 68, 69]])
```

In [105… `a[-4:-2]`

```
Out[105...   array([[60, 61, 62, 63, 64, 65, 66, 67, 68, 69],
                    [70, 71, 72, 73, 74, 75, 76, 77, 78, 79]])

In [106...   a

Out[106...   array([[ 0,  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, 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, 51, 52, 53, 54, 55, 56, 57, 58, 59],
                    [60, 61, 62, 63, 64, 65, 66, 67, 68, 69],
                    [70, 71, 72, 73, 74, 75, 76, 77, 78, 79],
                    [80, 81, 82, 83, 84, 85, 86, 87, 88, 89],
                    [90, 91, 92, 93, 94, 95, 96, 97, 98, 99]])

In [107...   a[0,1]

Out[107...   np.int64(1)

In [109...   a[1,3]

Out[109...   np.int64(13)

In [110...   a[1,2]

Out[110...   np.int64(12)

In [111...   a[2,3]

Out[111...   np.int64(23)

In [112...   a[0,-2]

Out[112...   np.int64(8)

In [113...   a[0,2]

Out[113...   np.int64(2)

In [114...   a[-5,-3]

Out[114...   np.int64(57)

In [115...   a[-4,2]

Out[115...   np.int64(62)

In [116...   a[-4,-2]

Out[116...   np.int64(68)

In [117...   a
```

```
Out[117…   array([[ 0,  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, 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, 51, 52, 53, 54, 55, 56, 57, 58, 59],
                  [60, 61, 62, 63, 64, 65, 66, 67, 68, 69],
                  [70, 71, 72, 73, 74, 75, 76, 77, 78, 79],
                  [80, 81, 82, 83, 84, 85, 86, 87, 88, 89],
                  [90, 91, 92, 93, 94, 95, 96, 97, 98, 99]])
```

In [118…   `a[1,4]`

Out[118…   `np.int64(14)`

In [119…   `a[-5,5]`

Out[119…   `np.int64(55)`

In [120…   `a[-1,-2]`

Out[120…   `np.int64(98)`

In [121…   `a[-7,-8]`

Out[121…   `np.int64(32)`

In [122…   `a[::1]`

```
Out[122…   array([[ 0,  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, 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, 51, 52, 53, 54, 55, 56, 57, 58, 59],
                  [60, 61, 62, 63, 64, 65, 66, 67, 68, 69],
                  [70, 71, 72, 73, 74, 75, 76, 77, 78, 79],
                  [80, 81, 82, 83, 84, 85, 86, 87, 88, 89],
                  [90, 91, 92, 93, 94, 95, 96, 97, 98, 99]])
```

In [123…   `a[::2]`

```
Out[123…   array([[ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9],
                  [20, 21, 22, 23, 24, 25, 26, 27, 28, 29],
                  [40, 41, 42, 43, 44, 45, 46, 47, 48, 49],
                  [60, 61, 62, 63, 64, 65, 66, 67, 68, 69],
                  [80, 81, 82, 83, 84, 85, 86, 87, 88, 89]])
```

In [124…   `a[::3]`

```
Out[124…   array([[ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9],
                  [30, 31, 32, 33, 34, 35, 36, 37, 38, 39],
                  [60, 61, 62, 63, 64, 65, 66, 67, 68, 69],
                  [90, 91, 92, 93, 94, 95, 96, 97, 98, 99]])
```

```
In [125...  a[::4]

Out[125...  array([[ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9],
               [40, 41, 42, 43, 44, 45, 46, 47, 48, 49],
               [80, 81, 82, 83, 84, 85, 86, 87, 88, 89]])

In [126...  a[1::]

Out[126...  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, 51, 52, 53, 54, 55, 56, 57, 58, 59],
               [60, 61, 62, 63, 64, 65, 66, 67, 68, 69],
               [70, 71, 72, 73, 74, 75, 76, 77, 78, 79],
               [80, 81, 82, 83, 84, 85, 86, 87, 88, 89],
               [90, 91, 92, 93, 94, 95, 96, 97, 98, 99]])

In [127...  a[::-1]

Out[127...  array([[90, 91, 92, 93, 94, 95, 96, 97, 98, 99],
               [80, 81, 82, 83, 84, 85, 86, 87, 88, 89],
               [70, 71, 72, 73, 74, 75, 76, 77, 78, 79],
               [60, 61, 62, 63, 64, 65, 66, 67, 68, 69],
               [50, 51, 52, 53, 54, 55, 56, 57, 58, 59],
               [40, 41, 42, 43, 44, 45, 46, 47, 48, 49],
               [30, 31, 32, 33, 34, 35, 36, 37, 38, 39],
               [20, 21, 22, 23, 24, 25, 26, 27, 28, 29],
               [10, 11, 12, 13, 14, 15, 16, 17, 18, 19],
               [ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9]])

In [128...  a[::-2]

Out[128...  array([[90, 91, 92, 93, 94, 95, 96, 97, 98, 99],
               [70, 71, 72, 73, 74, 75, 76, 77, 78, 79],
               [50, 51, 52, 53, 54, 55, 56, 57, 58, 59],
               [30, 31, 32, 33, 34, 35, 36, 37, 38, 39],
               [10, 11, 12, 13, 14, 15, 16, 17, 18, 19]])

In [129...  a[::-5]

Out[129...  array([[90, 91, 92, 93, 94, 95, 96, 97, 98, 99],
               [40, 41, 42, 43, 44, 45, 46, 47, 48, 49]])

In [130...  mat=a

In [131...  mat
```

```
Out[131...  array([[ 0,  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, 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, 51, 52, 53, 54, 55, 56, 57, 58, 59],
               [60, 61, 62, 63, 64, 65, 66, 67, 68, 69],
               [70, 71, 72, 73, 74, 75, 76, 77, 78, 79],
               [80, 81, 82, 83, 84, 85, 86, 87, 88, 89],
               [90, 91, 92, 93, 94, 95, 96, 97, 98, 99]])
```

In [132...
```
row=4
col=6
```

In [133...
```
row
```

Out[133...
```
4
```

In [134...
```
col
```

Out[134...
```
6
```

In [135...
```
mat[row,col]
```

Out[135...
```
np.int64(46)
```

In [136...
```
mat[5,4]
```

Out[136...
```
np.int64(54)
```

In [137...
```
mat[5]
```

Out[137...
```
array([50, 51, 52, 53, 54, 55, 56, 57, 58, 59])
```

In [138...
```
mat[:,6]
```

Out[138...
```
array([ 6, 16, 26, 36, 46, 56, 66, 76, 86, 96])
```

In [139...
```
mat[:,8]
```

Out[139...
```
array([ 8, 18, 28, 38, 48, 58, 68, 78, 88, 98])
```

```
mat
```

In [140...
```
mat[-1]
```

Out[140...
```
array([90, 91, 92, 93, 94, 95, 96, 97, 98, 99])
```

In [141...
```
mat[:,-1]
```

Out[141...
```
array([ 9, 19, 29, 39, 49, 59, 69, 79, 89, 99])
```

```
In [142…  mat[-7]

Out[142…  array([30, 31, 32, 33, 34, 35, 36, 37, 38, 39])

In [143…  mat[:,-7]

Out[143…  array([ 3, 13, 23, 33, 43, 53, 63, 73, 83, 93])

In [144…  mat[3:-3]

Out[144…  array([[30, 31, 32, 33, 34, 35, 36, 37, 38, 39],
                 [40, 41, 42, 43, 44, 45, 46, 47, 48, 49],
                 [50, 51, 52, 53, 54, 55, 56, 57, 58, 59],
                 [60, 61, 62, 63, 64, 65, 66, 67, 68, 69]])

In [145…  mat[3,-3]

Out[145…  np.int64(37)

In [146…  mat[6:]

Out[146…  array([[60, 61, 62, 63, 64, 65, 66, 67, 68, 69],
                 [70, 71, 72, 73, 74, 75, 76, 77, 78, 79],
                 [80, 81, 82, 83, 84, 85, 86, 87, 88, 89],
                 [90, 91, 92, 93, 94, 95, 96, 97, 98, 99]])

In [147…  mat[:6]

Out[147…  array([[ 0,  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, 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, 51, 52, 53, 54, 55, 56, 57, 58, 59]])

In [148…  mat

Out[148…  array([[ 0,  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, 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, 51, 52, 53, 54, 55, 56, 57, 58, 59],
                 [60, 61, 62, 63, 64, 65, 66, 67, 68, 69],
                 [70, 71, 72, 73, 74, 75, 76, 77, 78, 79],
                 [80, 81, 82, 83, 84, 85, 86, 87, 88, 89],
                 [90, 91, 92, 93, 94, 95, 96, 97, 98, 99]])

In [149…  mat[5:7]

Out[149…  array([[50, 51, 52, 53, 54, 55, 56, 57, 58, 59],
                 [60, 61, 62, 63, 64, 65, 66, 67, 68, 69]])

In [150…  mat[0:10]
```

```
Out[150…   array([[ 0,  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, 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, 51, 52, 53, 54, 55, 56, 57, 58, 59],
               [60, 61, 62, 63, 64, 65, 66, 67, 68, 69],
               [70, 71, 72, 73, 74, 75, 76, 77, 78, 79],
               [80, 81, 82, 83, 84, 85, 86, 87, 88, 89],
               [90, 91, 92, 93, 94, 95, 96, 97, 98, 99]])
```

In [151…   `mat[0:9]`

```
Out[151…   array([[ 0,  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, 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, 51, 52, 53, 54, 55, 56, 57, 58, 59],
               [60, 61, 62, 63, 64, 65, 66, 67, 68, 69],
               [70, 71, 72, 73, 74, 75, 76, 77, 78, 79],
               [80, 81, 82, 83, 84, 85, 86, 87, 88, 89]])
```

In [152…   `mat[0:9:10]`

```
Out[152…   array([[0, 1, 2, 3, 4, 5, 6, 7, 8, 9]])
```

In [153…   `mat[0:9:5]`

```
Out[153…   array([[ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9],
               [50, 51, 52, 53, 54, 55, 56, 57, 58, 59]])
```

In [154…   `mat[2:6,2:4]`

```
Out[154…   array([[22, 23],
               [32, 33],
               [42, 43],
               [52, 53]])
```

In [155…   `mat[2:6]`

```
Out[155…   array([[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, 51, 52, 53, 54, 55, 56, 57, 58, 59]])
```

In [156…   `mat[2:4]`

```
Out[156…   array([[20, 21, 22, 23, 24, 25, 26, 27, 28, 29],
               [30, 31, 32, 33, 34, 35, 36, 37, 38, 39]])
```

In [ ]:

In [ ]:

```
In [ ]:
```

```
In [ ]:
```

```
In [ ]:
```

```
In [ ]:
```