Python Numpy Array Slicing (:)

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

In [3]:
```
mtrx = np.arange(1,101).reshape(10,10)
print(mtrx)
```

```
[[  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  99 100]]
```

In [15]:
```
singleElement = mtrx[0,0]
singleElement1 = mtrx[1,0]

print(singleElement)
print(singleElement1)
singleElement.ndim
```

```
1
11
```

Out[15]: 0

In [16]:
```
#complete Row
print(mtrx[0])
print(mtrx[1])
mtrx[0].ndim
```

```
[ 1  2  3  4  5  6  7  8  9 10]
[11 12 13 14 15 16 17 18 19 20]
```

Out[16]: 1

In [17]:
```
#Complete Columns in single rows
print(mtrx[:,0])
#   all  rows(:,) zero columns in one dimension
mtrx[:,0].ndim
```

```
[ 1 11 21 31 41 51 61 71 81 91]
```

Out[17]: 1

In [20]:
```
#Complete Columns two dimesion
print(mtrx[:,0:1])
mtrx[:,0:1].ndim
```

```
[[ 1]
 [11]
 [21]
 [31]
 [41]
 [51]
 [61]
 [71]
 [81]
 [91]]
```

Out[20]: 2

In [21]:
```
mtrx
```

Out[21]:
```
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,  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, 100]])
```

In [23]:
```
print(mtrx[1:4,1:4])
```

```
[[12 13 14]
 [22 23 24]
 [32 33 34]]
```

In [24]:
```
print(mtrx[:,1:3])
```

```
[[ 2  3]
 [12 13]
 [22 23]
 [32 33]
 [42 43]
 [52 53]
 [62 63]
 [72 73]
 [82 83]
 [92 93]]
```

In [25]:
```
mtrx[:]
```

Out[25]:
```
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,  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, 100]])
```

In [26]:
```
mtrx[::]
```

Out[26]:
```
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,  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, 100]])
```

In [27]:
```
mtrx[:,:]
```

Out[27]:
```
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,  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, 100]])
```

In [28]:
```
#element bytes
mtrx.itemsize
```

Out[28]:
```
4
```

In [29]:
```
mtrx.dtype
```

Out[29]:
```
dtype('int32')
```