Python Numpy Array Slicing (:)

```
In [1]: import numpy as np
 In [3]: mtrx = np.arange(1,101).reshape(10,10)
         [[ 1
                                               10]
           11
               12 13
                       14 15 16 17 18 19
                                               20]
                               26 27
          [ 21
               22 23
                       24
                           2.5
                                       28 29
                                               301
          [ 31 32 33 34
                           35
                               36 37 38 39
                                               40]
          F 41 42 43
                       44
                            45
                               46 47 48 49
                                               501
            51 52
                   5.3
                       54
                            5.5
                               56 57
                                       58
                                           59
                                               601
                62
                                    67
          [ 61
                   63
                        64
                            65
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                                               701
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                                           69
                72
                        74
                            75
                                           79
            71
                    73
                                76
                                               80]
          [ 81
                82
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                       84
                               86
          [ 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
         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,
                                 4,
                                      5,
                                           6,
                                                7,
                                                     8,
                                                          9,
                                                              10],
                                14,
                                     15,
                 11, 12,
                           13,
                                          16,
                                               17,
                                                    18,
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                                                              20],
                 21, 22,
                                     25,
                           23,
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                [ 31, 32,
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                [ 41, 42,
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                 51, 52,
                            53,
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                [ 61, 62,
                            63,
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                            73,
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                                          76,
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                                                              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,
                                    4.
                                                    7,
                                                         8.
                                                                   101,
                               3.
                                               6,
                                                              9,
                  [ 11, 12, 13, 14, 15,
                                              16, 17, 18,
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                   21,
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                  [ 31, 32,
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                  [ 61,
                        62,
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                 [ 71,
                                   74,
                        72,
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                                                                   80],
                 [ 81, 82,
                              83,
                                   84,
                                        85,
                                              86,
                                                   87,
                                                        88,
                                                             89,
                                                                   901,
                                        95,
                                                   97,
                                                             99, 100]])
                 [ 91, 92, 93,
                                             96,
                                   94,
                                                        98,
In [26]: mtrx[::]
Out[26]: array([[ 1,  2,  3,  4,  5,  [ 11,  12,  13,  14,  15,  [ 21,  22,  23,  24,  25,
                                                  7,
17,
                                                         8,
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                  [ 51, 52,
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                 [ 81, 82,
                              83,
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                                                              89,
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                                                             99, 100]])
                 [ 91, 92, 93,
                                   94,
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                                              96,
                                                   97,
                                                        98,
In [27]: mtrx[:,:]
Out[27]: array([[ 1,
                        2,
                               3,
                                    4,
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                                                              9,
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                             13,
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                  [ 51, 52,
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                 [ 61,
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                 [ 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')
```