Python for Data Science

NumPy
Indexing and Selection

NumPy Indexing and Sele
localhost:8888/notebooks/NumPy%20Indexing%20and%20Selection.ipynb
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Python [conda env:py35]

NumPy Indexing and Selection

In [77]:
```
import numpy as np
```

In [78]:
```
arr = np.arange(0,11)
```

In [79]:
```
arr
```

Out[79]:
```
array([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10])
```

In [ ]:

In [77]:
```
import numpy as np
```

In [78]:
```
arr = np.arange(0,11)
```

In [79]:
```
arr
```

Out[79]:
```
array([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10])
```

In [80]:
```
arr[8]
```

Index value given

Out[80]:
```
8
```

In [ ]:
```

```

```
In [78]: arr = np.arange(0,11)

In [79]: arr
Out[79]: array([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10])

In [80]: arr[8]
Out[80]: 8

In [81]: arr[1:5]
Out[81]: array([1, 2, 3, 4])

In [ ]:
```

Out[79]: array([0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10])

In [80]:
```
arr[8]
```

Out[80]: 8

In [81]:
```
arr[1:5]
```

Out[81]: array([1, 2, 3, 4])

In [82]:
```
arr[0:5]
```

Out[82]: array([0, 1, 2, 3, 4])

In [ ]:

```
Out[80]: 8

In [81]: arr[1:5]
Out[81]: array([1, 2, 3, 4])

In [82]: arr[0:5]
Out[82]: array([0, 1, 2, 3, 4])

In [83]: arr[:6]
Out[83]: array([0, 1, 2, 3, 4, 5])

In [ ]:
```

```
Out[81]: array([1, 2, 3, 4])

In [82]: arr[0:5]

Out[82]: array([0, 1, 2, 3, 4])

In [85]: arr[0:6]

Out[85]: array([0, 1, 2, 3, 4, 5])

In [86]: arr[5:]

Out[86]: array([ 5,  6,  7,  8,  9, 10])

In [ ]:
```

In [85]:
```
arr[0:6]
```

Out[85]:
```
array([0, 1, 2, 3, 4, 5])
```

In [86]:
```
arr[5:]
```

Out[86]:
```
array([ 5,  6,  7,  8,  9, 10])
```

In [87]:
```
arr[0:5] = 100
```

In [88]:
```
arr
```

Out[88]:
```
array([100, 100, 100, 100, 100,   5,   6,   7,   8,   9,  10])
```

In [ ]:

In [87]:
```
arr[0:5] = 100
```

In [88]:
```
arr
```

Out[88]:
```
array([100, 100, 100, 100, 100,   5,   6,   7,   8,   9,  10])
```

In [89]:
```
arr = np.arange(0,11)
```

In [90]:
```
arr
```

Out[90]:
```
array([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10])
```

In [ ]:

Out[88]: array([100, 100, 100, 100, 100, 5, 6, 7, 8, 9, 10])

In [89]:
```
arr = np.arange(0,11)
```

In [90]:
```
arr
```

Out[90]: array([0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10])

In [91]:
```
slice_of_arr = arr[0:6]
```

In [92]:
```
slice_of_arr
```

Out[92]: array([0, 1, 2, 3, 4, 5])

In [ ]:

In [90]:
```
arr
```

Out[90]:
```
array([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10])
```

In [91]:
```
slice_of_arr = arr[0:6]
```

In [92]:
```
slice_of_arr
```

Out[92]:
```
array([0, 1, 2, 3, 4, 5])
```

In [93]:
```
slice_of_arr[:]
```

Out[93]:
```
array([0, 1, 2, 3, 4, 5])
```

In [ ]:

Out[90]: array([0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10])

In [91]:
```
slice_of_arr = arr[0:6]
```

In [92]:
```
slice_of_arr
```

Out[92]: array([0, 1, 2, 3, 4, 5])

In [94]:
```
slice_of_arr[:] = 99
```

In [95]:
```
slice_of_arr
```

Out[95]: array([99, 99, 99, 99, 99, 99])

In [ ]:

Out[90]: array([0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10])

In [91]:
```
slice_of_arr = arr[0:6]
```

In [92]:
```
slice_of_arr
```

Out[92]: array([0, 1, 2, 3, 4, 5])

In [94]:
```
slice_of_arr[:] = 99
```

In [95]:
```
slice_of_arr
```

Out[95]: array([99, 99, 99, 99, 99, 99])

In [ ]:

```
In [95]: slice_of_arr
Out[95]: array([99, 99, 99, 99, 99, 99])

In [96]: arr
Out[96]: array([99, 99, 99, 99, 99, 99,  6,  7,  8,  9, 10])

In [97]: arr_copy = arr.copy()

In [98]: arr
Out[98]: array([99, 99, 99, 99, 99, 99,  6,  7,  8,  9, 10])

In [ ]: a
```

```
In [96]: arr
Out[96]: array([99, 99, 99, 99, 99, 99,  6,  7,  8,  9, 10])

In [97]: arr_copy = arr.copy()

In [98]: arr
Out[98]: array([99, 99, 99, 99, 99, 99,  6,  7,  8,  9, 10])

In [99]: arr_copy
Out[99]: array([99, 99, 99, 99, 99, 99,  6,  7,  8,  9, 10])

In [ ]:
```

Out[96]: array([99, 99, 99, 99, 99, 99, 6, 7, 8, 9, 10])

In [97]:
```
arr_copy = arr.copy()
```

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

Out[98]: array([99, 99, 99, 99, 99, 99, 6, 7, 8, 9, 10])

In [100]:
```
arr_copy[:] = 100
```

In [101]:
```
arr_copy
```

Out[101]: array([100, 100, 100, 100, 100, 100, 100, 100, 100, 100, 100])

In [ ]:

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```
In [98]: arr

Out[98]: array([99, 99, 99, 99, 99, 99,  6,  7,  8,  9, 10])

In [100]: arr_copy[:] = 100

In [101]: arr_copy

Out[101]: array([100, 100, 100, 100, 100, 100, 100, 100, 100, 100, 100])

In [102]: arr

Out[102]: array([99, 99, 99, 99, 99, 99,  6,  7,  8,  9, 10])

In [ ]:
```

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Python [conda env:py35]

NumPy Indexing and Selection

In [104]:
```
import numpy as np
```

In [105]:
```
arr_2d = np.array([[5,10,15],[20,25,30],[35,40,45]])
```

In [106]:
```
arr_2d
```

Out[106]:
```
array([[ 5, 10, 15],
       [20, 25, 30],
       [35, 40, 45]])
```

In [ ]:

NumPy Indexing and Sele

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File Edit View Insert Cell Kernel Widgets Help | Python [conda env:py35]

In [104]:
```
import numpy as np
```

In [105]:
```
arr_2d = np.array([[5,10,15],[20,25,30],[35,40,45]])
```

In [106]:
```
arr_2d
```

Out[106]:
```
array([[ 5, 10, 15],
       [20, 25, 30],
       [35, 40, 45]])
```

In [108]:
```
arr_2d[0][0]
```

Out[108]:
```
5
```

In [ ]:

NumPy Indexing and Sele

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File Edit View Insert Cell Kernel Widgets Help | Python [conda env:py35]

In [104]:
```
import numpy as np
```

In [105]:
```
arr_2d = np.array([[5,10,15],[20,25,30],[35,40,45]])
```

In [106]:
```
arr_2d
```

Out[106]:
```
array([[ 5, 10, 15],
       [20, 25, 30],
       [35, 40, 45]])
```

In [109]:
```
arr_2d[0]
```

Out[109]:
```
array([ 5, 10, 15])
```

In [ ]:

NumPy Indexing and Sele

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File Edit View Insert Cell Kernel Widgets Help | Python [conda env:py35]

In [104]:
```
import numpy as np
```

In [105]:
```
arr_2d = np.array([[5,10,15],[20,25,30],[35,40,45]])
```

In [106]:
```
arr_2d
```

Out[106]:
```
array([[ 5, 10, 15],
       [20, 25, 30],
       [35, 40, 45]])
```

In [110]:
```
arr_2d[1][1]
```

Out[110]:
```
25
```

In [ ]:

NumPy Indexing and Sele

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File Edit View Insert Cell Kernel Widgets Help | Python [conda env:py35]

In [104]:
```
import numpy as np
```

In [105]:
```
arr_2d = np.array([[5,10,15],[20,25,30],[35,40,45]])
```

In [106]:
```
arr_2d
```

Out[106]:
```
array([[ 5, 10, 15],
       [20, 25, 30],
       [35, 40, 45]])
```

In [111]:
```
arr_2d[2][1]
```

Out[111]:
```
40
```

In [ ]:

NumPy Indexing and Sele

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File Edit View Insert Cell Kernel Widgets Help | Python [conda env:py35]

In [104]:
```
import numpy as np
```

In [105]:
```
arr_2d = np.array([[5,10,15],[20,25,30],[35,40,45]])
```

In [106]:
```
arr_2d
```

Out[106]:
```
array([[ 5, 10, 15],
       [20, 25, 30],
       [35, 40, 45]])
```

In [112]:
```
arr_2d[2,1]
```

Out[112]:
```
40
```

In [ ]:

NumPy Indexing and Sele

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Python [conda env:py35]

In [106]:
```
arr_2d
```

Out[106]:
```
array([[ 5, 10, 15],
       [20, 25, 30],
       [35, 40, 45]])
```

In [113]:
```
arr_2d[1,2]
```

Out[113]:
```
30
```

In [114]:
```
arr_2d[1][2]
```

Out[114]:
```
30
```

In [ ]:

In [106]:
```
arr_2d
```

Out[106]:
```
array([[ 5, 10, 15],
       [20, 25, 30],
       [35, 40, 45]])
```

In [115]:
```
arr_2d[:2,1:]
```

Out[115]:
```
array([[10, 15],
       [25, 30]])
```

In [114]:
```

```

Out[114]:
```
30
```

In [ ]:
```

```

In [106]:
```
arr_2d
```

Out[106]:
```
array([[ 5, 10, 15],
       [20, 25, 30],
       [35, 40, 45]])
```

In [115]:
```
arr_2d[:2,1:]
```

Out[115]:
```
array([[10, 15],
       [25, 30]])
```

In [116]:
```
arr_2d[:2]
```

Out[116]:
```
array([[ 5, 10, 15],
       [20, 25, 30]])
```

In [ ]:

In [106]:
```
arr_2d
```

Out[106]:
```
array([[ 5, 10, 15],
       [20, 25, 30],
       [35, 40, 45]])
```

In [117]:
```
arr = np.arange(1,11)
```

In [118]:
```
arr
```

Out[118]:
```
array([ 1,  2,  3,  4,  5,  6,  7,  8,  9, 10])
```

In [ ]:

```
Out[106]: array([[ 5, 10, 15],
                 [20, 25, 30],
                 [35, 40, 45]])
```

In [117]:
```
arr = np.arange(1,11)
```

In [118]:
```
arr
```

Out[118]:
```
array([ 1,  2,  3,  4,  5,  6,  7,  8,  9, 10])
```

In [119]:
```
arr > 5
```

Out[119]:
```
array([False, False, False, False, False,  True,  True,  True,  True,  True], dtype=bool)
```

In [ ]:

```
[33, 40, 43]])
```

In [117]:
```
arr = np.arange(1,11)
```

In [118]:
```
arr
```

Out[118]:
```
array([ 1,  2,  3,  4,  5,  6,  7,  8,  9, 10])
```

In [120]:
```
bool_arr = arr > 5
```

In [121]:
```
bool_arr
```

Out[121]:
```
array([False, False, False, False, False,  True,  True,  True,  True,  True], dtype=bool)
```

In [ ]:

NumPy Indexing and Sele

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In [118]:
```
arr
```

Out[118]:
```
array([ 1,  2,  3,  4,  5,  6,  7,  8,  9, 10])
```

In [120]:
```
bool_arr = arr > 5
```

In [121]:
```
bool_arr
```

Out[121]:
```
array([False, False, False, False, False,  True,  True,  True,  True,  True], dtype=bool)
```

In [122]:
```
arr[bool_arr]
```

Out[122]:
```
array([ 6,  7,  8,  9, 10])
```

In [ ]:

In [121]:
```
bool_arr
```

Out[121]:
```
array([False, False, False, False, False,  True,  True,  True,  True,  True], dtype=bool)
```

In [122]:
```
arr[bool_arr]
```

Out[122]:
```
array([ 6,  7,  8,  9, 10])
```

In [123]:
```
arr[arr>5]
```

Out[123]:
```
array([ 6,  7,  8,  9, 10])
```

In [ ]:

```
type=bool)
```

In [122]:
```
arr[bool_arr]
```

Out[122]:
```
array([ 6,  7,  8,  9, 10])
```

In [123]:
```
arr[arr>5]
```

Used more no. of times in Pandas

Out[123]:
```
array([ 6,  7,  8,  9, 10])
```

In [124]:
```
arr[arr<3]
```

Used more no. of times in Pandas

Out[124]:
```
array([1, 2])
```

In [ ]:

In [123]:
```
arr[arr>5]
```

Out[123]:
```
array([ 6,  7,  8,  9, 10])
```

In [124]:
```
arr[arr<3]
```

Out[124]:
```
array([1, 2])
```

In [125]:
```
arr_2d = np.arange(50).reshape(5,10)
```

In [126]:
```
arr_2d
```

Out[126]:
```
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]])
```

In [ ]:

Out[124]:
```
array([1, 2])
```

In [125]:
```
arr_2d = np.arange(50).reshape(5,10)
```

In [131]:
```
arr_2d[1:3,3:5]
```

Out[131]:
```
array([[13, 14],
       [23, 24]])
```

In [130]:
```
arr_2d[1:3]
```

Out[130]:
```
array([[10, 11, 12, 13, 14, 15, 16, 17, 18, 19],
       [20, 21, 22, 23, 24, 25, 26, 27, 28, 29]])
```

In [ ]: