e-10

March 11, 2025

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

[30]:
```
surnames = ('ahrari', 'sahebi', 'ahrari')
first_names = ('shayan', 'sara', 'fati')

x = np.array([3, 1, 2, 6, 7, 0, 8, 10])
y = np.array([3, 1, 2, 6, 7, 0, 8, 10])

a = np.array([
    [1, 4, 2],
    [3, 1, 6]
])

b = np.array([[0, 1, 7, 0],
              [3, 0, 2, 19]])
```

[31]:
```
y.sort() # do sorting on base obj
y
```

[31]:
```
array([ 0,  1,  2,  3,  6,  7,  8, 10])
```

[32]:
```
np.sort(x) # craeat a copy from base obj
```

[32]:
```
array([ 0,  1,  2,  3,  6,  7,  8, 10])
```

[33]:
```
np.lexsort((first_names, surnames))
```

[33]:
```
array([2, 0, 1])
```

[34]:
```
np.argsort(x) # showing index for sorting
```

[34]:
```
array([5, 1, 2, 0, 3, 4, 6, 7])
```

[35]:
```
np.argmax(a)
```

[35]:
```
np.int64(5)
```

[36]:
```
np.argmin(a)
```

[36]:
```
np.int64(0)
```

[37]:
```
np.argmax(a, axis=0)
```

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

[38]:
```
np.argmin(a, axis=0)
```

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

[39]:
```
np.argmax(a, axis=1)
```

[39]:
```
array([1, 2])
```

[40]:
```
np.argmin(a, axis=1)
```

[40]:
```
array([0, 1])
```

[41]:
```
np.searchsorted([11,12, 14, 15], 13) # should be on index 2
```

[41]:
```
np.int64(2)
```

[42]:
```
condition = np.mod(a, 3)==0 # used for below cell
condition
```

[42]:
```
array([[False, False, False],
       [ True, False,  True]])
```

[43]:
```
np.extract(condition, a)
```

[43]:
```
array([3, 6])
```

[44]:
```
np.count_nonzero(b)
```

[44]:
```
5
```

[45]:
```
np.count_nonzero(b, axis=0)
```

[45]:
```
array([1, 1, 2, 1])
```

[46]:
```
np.count_nonzero(b, axis=1)
```

[46]:
```
array([2, 3])
```

[47]:
```
np.count_nonzero(b, axis=1, keepdims=True)
```

[47]:
```
array([[2],
       [3]])
```

[54]:
```
e = np.array([[1, 2, 3], [4, 0, 6], [7, 8, 9]]) # used for below cell
e > 3
```

[54]:
```
array([[False, False, False],
       [ True, False,  True],
       [ True,  True,  True]])
```

[55]:
```
e
```

[55]:
```
array([[1, 2, 3],
       [4, 0, 6],
       [7, 8, 9]])
```

[56]:
```
np.nonzero(e > 3) # index out
```

[56]:
```
(array([1, 1, 2, 2, 2]), array([0, 2, 0, 1, 2]))
```

[57]:
```
np.nonzero(e) # index out
```

[57]:
```
(array([0, 0, 0, 1, 1, 2, 2, 2]), array([0, 1, 2, 0, 2, 0, 1, 2]))
```

[ ]:
```

```