NumPy Array Copy vs View

[❮](https://www.w3schools.com/python/numpy/numpy_data_types.asp)

The Difference Between Copy and View

The main difference between a copy and a view of an array is that the copy is a new array, and the view is just a view of the original array.

The copy *owns* the data and any changes made to the copy will not affect original array, and any changes made to the original array will not affect the copy.

The view *does not own* the data and any changes made to the view will affect the original array, and any changes made to the original array will affect the view.

COPY:

Example[Get your own Python Server](https://www.w3schools.com/python/python_server.asp)

Make a copy, change the original array, and display both arrays:

import numpy as np  
  
arr = np.array([1, 2, 3, 4, 5])  
x = arr.copy()  
arr[0] = 42  
  
print(arr)  
print(x)

[Try it Yourself »](https://www.w3schools.com/python/numpy/trypython.asp?filename=demo_numpy_array_copy)

The copy SHOULD NOT be affected by the changes made to the original array.

VIEW:

Example

Make a view, change the original array, and display both arrays:

import numpy as np  
  
arr = np.array([1, 2, 3, 4, 5])  
x = arr.view()  
arr[0] = 42  
  
print(arr)  
print(x)

[Try it Yourself »](https://www.w3schools.com/python/numpy/trypython.asp?filename=demo_numpy_array_view1)

The view SHOULD be affected by the changes made to the original array.

Make Changes in the VIEW:

Example

Make a view, change the view, and display both arrays:

import numpy as np  
  
arr = np.array([1, 2, 3, 4, 5])  
x = arr.view()  
x[0] = 31  
  
print(arr)  
print(x)

[Try it Yourself »](https://www.w3schools.com/python/numpy/trypython.asp?filename=demo_numpy_array_view2)

The original array SHOULD be affected by the changes made to the view.

Check if Array Owns its Data

As mentioned above, copies *owns* the data, and views *does not own* the data, but how can we check this?

Every NumPy array has the attribute base that returns None if the array owns the data.

Otherwise, the base  attribute refers to the original object.

Example

Print the value of the base attribute to check if an array owns it's data or not:

import numpy as np  
  
arr = np.array([1, 2, 3, 4, 5])  
  
x = arr.copy()  
y = arr.view()  
  
print(x.base)  
print(y.base)

[Try it Yourself »](https://www.w3schools.com/python/numpy/trypython.asp?filename=demo_numpy_array_base)

The copy returns None.  
The view returns the original array.