NumPy Array Copy vs View

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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

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 »

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 »

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 »

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

Check if Array Owns it's 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 »

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

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