NumPy Splitting Array

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Splitting NumPy Arrays

Splitting is reverse operation of Joining.

Joining merges multiple arrays into one and Splitting breaks one array into multiple.

We use `array_split()` for splitting arrays, we pass it the array we want to split and the number of splits.

Example

Split the array in 3 parts:

```
import numpy as np

arr = np.array([1, 2, 3, 4, 5, 6])

newarr = np.array_split(arr, 3)

print(newarr)
```

If the array has less elements than required, it will adjust from the end accordingly.

Example

Split the array in 4 parts:

```
import numpy as np

arr = np.array([1, 2, 3, 4, 5, 6])

newarr = np.array_split(arr, 4)

print(newarr)
```

Try it Yourself »

Note: We also have the method `split()` available but it will not adjust the elements when elements are less in source array for splitting like in example above, `array_split()` worked properly but `split()` would fail.

Split Into Arrays

The return value of the `array_split()` method is an array containing each of the split as an array.

If you split an array into 3 arrays, you can access them from the result just like any array element:

Example

Access the splitted arrays:

```
import numpy as np

arr = np.array([1, 2, 3, 4, 5, 6])

newarr = np.array_split(arr, 3)

print(newarr[0])
print(newarr[1])
print(newarr[2])
```

Try it Yourself »

Use the `array_split()` method, pass in the array you want to split and the number of splits you want to do.

Example

Split the 2-D array into three 2-D arrays.

```
import numpy as np

arr = np.array([[1, 2], [3, 4], [5, 6], [7, 8], [9, 10], [11, 12]])

newarr = np.array_split(arr, 3)

print(newarr)
```

Try it Yourself »

The example above returns three 2-D arrays.

Let's look at another example, this time each element in the 2-D arrays contains 3 elements.

Example

Split the 2-D array into three 2-D arrays.

```
import numpy as np

arr = np.array([[1, 2, 3], [4, 5, 6], [7, 8, 9], [10, 11, 12], [13, 14, 15],
[16, 17, 18]])

newarr = np.array_split(arr, 3)

print(newarr)
```

The example above returns three 2-D arrays.

In addition, you can specify which axis you want to do the split around.

The example below also returns three 2-D arrays, but they are split along the row (axis=1).

Example

Split the 2-D array into three 2-D arrays along rows.

```
import numpy as np

arr = np.array([[1, 2, 3], [4, 5, 6], [7, 8, 9], [10, 11, 12], [13, 14, 15],
[16, 17, 18]])

newarr = np.array_split(arr, 3, axis=1)

print(newarr)
```

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An alternate solution is using `hsplit()` opposite of `hstack()`

Example

Use the `hsplit()` method to split the 2-D array into three 2-D arrays along rows.

```
import numpy as np

arr = np.array([[1, 2, 3], [4, 5, 6], [7, 8, 9], [10, 11, 12], [13, 14, 15],
[16, 17, 18]])

newarr = np.hsplit(arr, 3)
```

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Note: Similar alternates to `vstack()` and `dstack()` are available as `vsplit()` and `dsplit()`.

Exercise ?

One of these functions can be used to split an array into multiple arrays.
Which one?

- ○ `array_split()`
- ○ `decatenate()`
- ○ `decat()`

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