



# NumPy Differences

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## Differences

A discrete difference means subtracting two successive elements.

E.g. for  $[1, 2, 3, 4]$ , the discrete difference would be  $[2-1, 3-2, 4-3] = [1, 1, 1]$

To find the discrete difference, use the `diff()` function.

## Example

Compute discrete difference of the following array:

```
import numpy as np

arr = np.array([10, 15, 25, 5])

newarr = np.diff(arr)

print(newarr)
```

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**Returns:** `[ 5 10 -20]` because  $15-10=5$ ,  $25-15=10$ , and  $5-25=-20$

We can perform this operation repeatedly by giving parameter `n`.

E.g. for `[1, 2, 3, 4]`, the discrete difference with `n = 2` would be `[2-1, 3-2, 4-3] = [1, 1, 1]`, then, since `n=2`, we will do it once more, with the new result: `[1-1, 1-1] = [0, 0]`

## Example

Compute discrete difference of the following array twice:

```
import numpy as np

arr = np.array([10, 15, 25, 5])

newarr = np.diff(arr, n=2)

print(newarr)
```

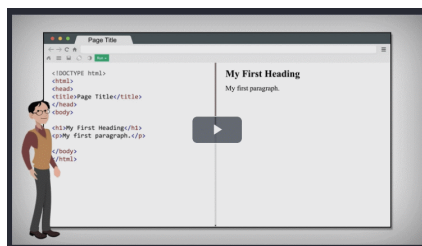
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**Returns:** `[5 -30]` because:  $15-10=5$ ,  $25-15=10$ , and  $5-25=-20$  AND  $10-5=5$  and  $-20-10=-30$

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