Simple Arithmetic

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Simple Arithmetic

You could use arithmetic operators `+` `-` `*` `/` directly between NumPy arrays, but this section discusses an extension of the same where we have functions that can take any array-like objects e.g. lists, tuples etc. and perform arithmetic *conditionally*.

Arithmetic Conditionally: means that we can define conditions where the arithmetic operation should happen.

All of the discussed arithmetic functions take a `where` parameter in which we can specify that condition.

Addition

The `add()` function sums the content of two arrays, and return the results in a new array.

Example

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```
arr1 = np.array([10, 11, 12, 13, 14, 15])
arr2 = np.array([20, 21, 22, 23, 24, 25])

newarr = np.add(arr1, arr2)

print(newarr)
```

Try it Yourself »

The example above will return [30 32 34 36 38 40] which is the sums of 10+20, 11+21, 12+22 etc.

Subtraction

The `subtract()` function subtracts the values from one array with the values from another array, and return the results in a new array.

Example

Subtract the values in arr2 from the values in arr1:

```
import numpy as np

arr1 = np.array([10, 20, 30, 40, 50, 60])
arr2 = np.array([20, 21, 22, 23, 24, 25])

newarr = np.subtract(arr1, arr2)

print(newarr)
```

The example above will return [-10 -1 8 17 26 35] which is the result of 10-20, 20-21, 30-22 etc.

Multiplication

The `multiply()` function multiplies the values from one array with the values from another array, and return the results in a new array.

Example

Multiply the values in arr1 with the values in arr2:

```
import numpy as np

arr1 = np.array([10, 20, 30, 40, 50, 60])
arr2 = np.array([20, 21, 22, 23, 24, 25])

newarr = np.multiply(arr1, arr2)

print(newarr)
```

Try it Yourself »

The example above will return [200 420 660 920 1200 1500] which is the result of 10*20, 20*21, 30*22 etc.

Division

Example

Divide the values in arr1 with the values in arr2:

```
import numpy as np

arr1 = np.array([10, 20, 30, 40, 50, 60])
arr2 = np.array([3, 5, 10, 8, 2, 33])

newarr = np.divide(arr1, arr2)

print(newarr)
```

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The example above will return [3.33333333 4. 3. 5. 25. 1.81818182] which is the result of 10/3, 20/5, 30/10 etc.

Power

The `power()` function rises the values from the first array to the power of the values of the second array, and return the results in a new array.

Example

Raise the valules in arr1 to the power of values in arr2:

```
import numpy as np

arr1 = np.array([10, 20, 30, 40, 50, 60])
arr2 = np.array([3, 5, 6, 8, 2, 33])
```

Try it Yourself »

The example above will return [1000 3200000 729000000 6553600000000 2500 0] which is the result of 10*10*10, 20*20*20*20*20, 30*30*30*30*30*30 etc.

Remainder

Both the `mod()` and the `remainder()` functions return the remainder of the values in the first array corresponding to the values in the second array, and return the results in a new array.

Example

Return the remainders:

```
import numpy as np

arr1 = np.array([10, 20, 30, 40, 50, 60])
arr2 = np.array([3, 7, 9, 8, 2, 33])

newarr = np.mod(arr1, arr2)

print(newarr)
```

Try it Yourself »

You get the same result when using the `remainder()` function:

Example

Return the remainders:

```
import numpy as np

arr1 = np.array([10, 20, 30, 40, 50, 60])
arr2 = np.array([3, 7, 9, 8, 2, 33])

newarr = np.remainder(arr1, arr2)

print(newarr)
```

Try it Yourself »

Quotient and Mod

The `divmod()` function return both the quotient and the mod. The return value is two arrays, the first array contains the quotient and second array contains the mod.

Example

Return the quotient and mod:

```
import numpy as np

arr1 = np.array([10, 20, 30, 40, 50, 60])
arr2 = np.array([3, 7, 9, 8, 2, 33])

newarr = np.divmod(arr1, arr2)
```

The example above will return:
(array([3, 2, 3, 5, 25, 1]), array([1, 6, 3, 0, 0, 27]))
The first array represents the quotients, (the integer value when you divide 10 with 3, 20 with 7, 30 with 9 etc.
The second array represents the remainders of the same divisions.

Absolute Values

Both the `absolute()` and the `abs()` functions do the same absolute operation element-wise but we should use `absolute()` to avoid confusion with python's inbuilt `math.abs()`

Example

Return the quotient and mod:

```
import numpy as np

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

newarr = np.absolute(arr)

print(newarr)
```

Try it Yourself »

The example above will return [1 2 1 2 3 4].

Exercise ?

Consider the following code:

```
import numpy as np
x = [2, 5, 5, 1]
y = [1, 4, 3, 1]
z = np.subtract(x, y)
```

What will be the result of `z` ?

- ○ `[ 4 2 2 1]`
- ○ `[ 3 9 8 2]`
- ○ `[ 2 1 5 1]`
- ○ `[ 1 1 2 0]`

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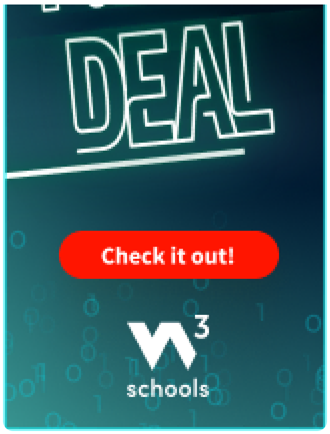

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