

Arithmetic

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ARITHMETIC

The following are Arithmetic operations. Different data types can supported, in these examples we will casted in the integer data type. Arithmetic may seem trivial but complications can arise when numbers of different data types are used together.

ADDITION

Firstly we will cover simple addition, the art of adding two or more number values together, see example for a basic addition using casting and a `print()` method which we explored earlier:

```
In [60]: num1 = int(5)
         num2 = int(10)
         sum = num1 + num2
         print("The sum is", sum)

Out[61]: The sum is 15
```

SUBTRACTION

Secondly we will cover simple subtraction, the art of taking one numeric value from another and calculating the result. Like before see the example:

```
In [63]: num1 = int(10)
         num2 = int(5)
         sum = num1 - num2
         print("The sum is", sum)

Out[64]: The sum is 5
```

MULTIPLICATION

Thirdly we will cover multiplication, the art of multiplying or value by another. In more simple terms, one values times by another value. See example:

```
In [65]: num1 = int(10)
         num2 = int(5)
         sum = num1 * num2
         print("The sum is", sum)

Out[66]: The sum is 50
```

DIVISION

Finally we will cover division, the opposite of multiplication which sees one value being shared between another value and calculating this said amount, see example.

```
In [67]: num1 = int(10)
         num2 = int(2)
         sum = num1 // num2
         print("The sum is", sum)

Out[68]: The sum is 5
```

Because the data type has been casted as a integer, we must use the integer division assignment operator for our calculation. The following is an example of float division which uses the float division operator instead:

```
In [69]: num1 = float(10.7)
         num2 = float(256.89)
         sum = num1 / num2
         print("The sum is", sum)
```

Out[70]: The sum is 0.0416520689789404

ARITHMETIC WITH DIFFERENT DATA TYPES

When dealing with multiple data types, can start by creating 3 numbers, note we cast the data type.

```
In [71]: a = int(2)
         b = float(6.0)
         c = complex(12 + 0j)
         print(a, b, c)
```

Out[73]: 2 6.0 (12+0j)

When combining two numbers of different types. Python will convert the narrower type into the wider type then perform the operation.

If we add a and b, we are adding a int and a float, because floats are wider than integers, Python converts a into a float then adds, the end result is a float see example:

```
In [74]: a = int(2)
         b = float(6.0)
         print(a+b)
```

Out[75]: 8.0

If we subtract b and a, we are subtracting an integer from a float, because integers are narrower than floats, Python widens a to a float and then subtracts, making the result a float. See example:

```
In [76]: a = int(2)
         b = float(6.0)
         print(a-b)
```

Out[77]: -4.0

In multiplication, if we multiply b and a, we are multiplying a float by an integer, the result is 12.

```
In [78]: a = int(2)
         b = float(6.0)
         print(a*b)
```

Out[79]: 12.0

In Division if we divide c by b, b is narrower than a complex number because it is a float, thus it is widened to a complex number before division takes place. The result is a complex number, see example:

```
In [80]: a = int(2)
         c = complex(12 + 0j)
         print(c/b)
```

Out[81]: (2+0j)