2\_1\_3\_10\_Section\_Summary

**Key takeaways**

1. An **expression** is a combination of values (or variables, operators, calls to functions - you will learn about them soon) which evaluates to a value, e.g., 1 + 2.

2. **Operators** are special symbols or keywords which are able to operate on the values and perform (mathematical) operations, e.g., the \* operator multiplies two values: x \* y.

3. Arithmetic operators in Python: + (addition), - (subtraction), \* (multiplication), / (classic division - returns a float if one of the values is of float type), % (modulus - divides left operand by right operand and returns the remainder of the operation, e.g., 5 % 2 = 1), \*\* (exponentiation - left operand raised to the power of right operand, e.g., 2 \*\* 3 = 2 \* 2 \* 2 = 8), // (floor/integer division - returns a number resulting from division, but rounded down to the nearest whole number, e.g., 3 // 2.0 = 1.0)

4. A **unary** operator is an operator with only one operand, e.g., -1, or +3.

5. A **binary** operator is an operator with two operands, e.g., 4 + 5, or 12 % 5.

6. Some operators act before others - **the hierarchy of priorities**:

* unary + and - have the highest priority
* then: \*\*, then: \*, /, and %, and then the lowest priority: binary + and -.

7. Subexpressions in **parentheses** are always calculated first, e.g., 15 - 1 \* (5 \* (1 + 2)) = 0.

8. The **exponentiation** operator uses **right-sided binding**, e.g., 2 \*\* 2 \*\* 3 = 256.

**Exercise 1**

What is the output of the following snippet?

print((2 \*\* 4), (2 \* 4.), (2 \* 4))  
Check

16 8.0 8

**Exercise 2**

What is the output of the following snippet?

print((-2 / 4), (2 / 4), (2 // 4), (-2 // 4))  
Check

-0.5 0.5 0 -1

**Exercise 3**

What is the output of the following snippet?

print((2 % -4), (2 % 4), (2 \*\* 3 \*\* 2))  
Check

-2 2 512

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