Python Integers, Floats (Numerical Data) and Basic Arithmetic Operations

In Python, integers (`int`) and floating-point numbers (`float`) are used to represent numerical data. Integers are whole numbers, such as `1`, `2`, `3`, `−1`, `−2`, `−3`, etc., while floating-point numbers are numbers with a decimal point, such as `1.0`, `2.5`, `3.14`, `−1.5`, etc. In this lesson, we will learn how to work with integers and floating-point numbers in Python.

Integers (`int`)

Integers are whole numbers that can be positive or negative. In Python, integers are represented using the `int` data type. Here are some examples of integers:

```
x = 1
y = -2
```

In this example, the variable `x` is assigned the integer value `1`, and the variable `y` is assigned the integer value `−2`.

Floating-Point Numbers (`float`)

Floating-point numbers are numbers with a decimal point that can represent both whole numbers and fractions. In Python, floating-point numbers are represented using the `float` data type. Here are some examples of floating-point numbers:

```
x = 1.0
y = 3.14
```

In this example, the variable `x` is assigned the floating-point value `1.0`, and the variable `y` is assigned the floating-point value `3.14`.

Python Operators

Python provides several arithmetic operators that can be used to perform basic arithmetic operations on numerical data. Here are some of the most common arithmetic operators in Python:

1. **Addition (+)**: Adds two numbers together.
2. **Subtraction (−)**: Subtracts one number from another.
3. **Multiplication (*)**: Multiplies two numbers together.
4. **Division (/)**: Divides one number by another.
5. **Exponentiation (**)**: Raises one number to the power of another.

6. **Modulus (%)**: Returns the remainder of the division of one number by another.
7. **Floor Division (//)**: Returns the integer part of the division of one number by another.
8. **Equality (==)**: Compares two numbers for equality.

Here are some examples of using arithmetic operators in Python:

```python
# Addition
result = 1 + 2
print(result)   # Output: 3

# Subtraction
result = 3 - 1
print(result)   # Output: 2

# Multiplication
result = 2 * 3
print(result)   # Output: 6

# Division
result = 10 / 2
print(result)   # Output: 5.0

# Exponentiation
result = 2 ** 3
print(result)   # Output: 8

# Modulus
result = 10 % 3
print(result)   # Output: 1

# Floor Division
result = 10 // 3
print(result)   # Output: 3

# Equality
result = 5 == 5
print(result)   # Output: True
```

Exercise: Try using the arithmetic operators in Python to perform basic arithmetic operations on integers and floating-point numbers.