Variables, Data Types, & Operators

Summary:

- Variables: Variables are containers that store values of data of different types.
- Data Types:
  - Numeric Type:
    - `Int (e.g., 3, 4, -1, -2)`
    - `Float (e.g., 3.4, -2.9)`
  - Text Type:
    - `String (e.g., "Hello", 'abc', "3.45")`
  - Sequence Type:
    - `Tuple (e.g., (1, 2, 3), ("abc", 1, 1.2))`
    - `List (e.g., [1, 2, 3], ["abc", 1, 1.2])`
    - `Range (e.g., range(-2, 70), range(5), range(0,6))`
  - Boolean Type:
    - `Bool (e.g., True, False)`
- Operators:
  - Arithmetic Operators:
    - `Addition: + (e.g., 1+2 is 3)`
    - `Subtraction: - (e.g., 1-2 is -1)`
    - `Multiplication: * (e.g., 1*2 is 2)`
    - `Division: / (e.g., 1/2 is 0.5)`
    - `Modulus: % (e.g., 10%3 is 1)`
    - `Floor Division: // (e.g., 1//2 is 0)`
    - `Exponential: ** (e.g., 2**3 is 8)`
  - Assignment Operators:
    - `Equal To: =`
    - `Shorthand's:`
      - `+= (e.g., a += 3 →a = a + 3)`
      - `-= (e.g., a -= 2 →a = a - 2)`
  - Comparison Operators:
    - `Check if equal: == (e.g., 3==3 is True)`

- Greater than: > (e.g., 1>2 is False)
- Lower than: < (e.g., 1<2 is True)
- Greater than or equal to: >= (e.g., 2>=2 is True)
- Lower than or equal to: <= (e.g., 2<=2 is True)
- Not equal to: != (e.g., 3!=2 is True)

Exercises:

- Exercise 1: What is `5/2? 5//2? 5%2`?
- Exercise 2: What is the difference between `x=5` and `x==5`?
- Exercise 3: `x=3`. What is the smallest value of y such that `x**y>=9` results in a value of True?
- Exercise 4: What is `"one"*2`?
- Exercise 5: `a=5`. What is the value of `x` if: `(1)a+=x, a=10; (2)a-=x, a=0`.
- Exercise 6: What is `"one"+"two"`? What is the data type of the output?
- Exercise 7: Following Ex. 6, how do you think the + operator works differently for `"one"+"two"` and for `1+2?`