Variables and Types Examples Exploration

Class Exercise

Open example *Variables in Action* and answer the following questions:

a. What happens when you change line 3 to read `value = num + 1`?

value now stores a number (integer) instead of whatever it stored before. Since num is an integer, adding 1 makes value an integer as well.

b. Keeping the above alteration in place, what do you think will happen if you change line 7 to read `print(value + num)`?

Yes, the hypothesis is correct. Python prints the sum of value and num.
Because both value and num are integers, Python will add them together and print their sum.

c. Make the change as noted above. Was your hypothesis correct? What happened?

num is an integer and greeting is a string. In Python, multiplying a string by an integer repeats the string that many times.

d. What do you think will happen if you change line 6 to read `print(num*greeting)`?

Python prints the string greeting repeated num times (all in one line).

e. Make the change as noted above. Was your hypothesis correct? What happened?
Python will identify 2.0 as a floating-point number.

This shows that Python correctly identifies 2.0 as a floating-point number (float).

2. Open example *Variables Types* and answer the following questions:
    a. What do you think will happen if you change the first line to read `print(type(2.0))`?
    Python will identify 2.0 as a floating-point number and display its data type.

    b. Make the change as noted above. Was your hypothesis correct? What happened?
    Yes, the hypothesis was correct. When the program runs, Python prints

    c. Add a new line to the end of the program that reads `print(type(True))`? What prints when this line is run?
    <class 'bool'>

    d. Do some research to find out what this new type is. Record your info below.

    bool stands for Boolean. A Boolean data type can only have two values: True or False. Booleans are commonly used in logical expressions and decision-making, such as in if statements and comparisons.

Check for Understanding Exercise
Provide responses to the following End of Lesson questions:

1. What are the 3 different characteristics of a variable?
   Name – the identifier used to refer to the variable

   Value – the data stored in the variable

   Type – the kind of data the variable holds (such as int, str, float, bool)

2. What is str short for? What is int short for? What is float short for?

   (`str` → string) (`int` → integer) (`float` → floating-point number)

3. What are some rules and guidelines for writing Python variable names?
   Must start with a letter or an underscore (_)
   Cannot start with a number
   Can only contain letters, numbers, and underscores
   No spaces allowed
   Cannot use Python keywords (such as `if`, `for`, `while`)
   Variable names should be descriptive and use lowercase letters (e.g., `total_score`)

4. What is wrong with the following variable assignment? `count == 0`

   ```
   count = 0
   ```