09-09 - Input/Output

# 1. Retrieval

* Which statement correctly describes the relationship between a variable and an object in Python?

1. A variable is a function that defines an object.
2. A variable points to the memory location of an object.
3. A variable is a unique identifier within a class, while an object is a function.
4. A variable can only store primitive data types, whereas an object stores complex data types.

Given the following Python code snippet:

x = 10  
y = 3.14  
z = "hello"  
w = 904

Identify the data types of the variables x, y, z, and w.

Review the following Python code snippet:

def = 42  
print(def)

What is the problem with the variable name def in this code, and how can it be corrected?

Review the following lines of code, each involving the assignment operator (=). Determine whether the assignment is correct or incorrect for each line. Justify your answer, and if a line contains an error, provide the correct version of the code.

1. length \* width = area
2. num = 3.14
3. x, y, z = 1, 2, 3
4. 10 = ten\_value

* Which of the following lines of code correctly increments the variable score by 5?

1. score = score + 5
2. score = score - 5
3. score += 5
4. score =+ 5

* Consider the following Python code snippet:

a = "hello"  
b = "world"  
a = b  
b = a

What is the problem with this code when attempting to swap the values of a and b, and what will be the final values of a and b?

# 2. Input and Output Functions (POGIL, 15 min)

You can use *functions* to perform specific operations. Some functions require values, known as *arguments*, to perform their operation. Functions may also *return* a result. For example:

name = input("What's your name? ")

input is a function, "What's your name? " is an argument, and the return value (typed by the user) is stored in name.

The following table shows additional examples of functions. They were written by a scientist to set up an experiment.

**Do not type anything yet! Read the questions first!**

| Python code | Shell output |
| --- | --- |
| input("enter the mass in grams: ") |  |
| mass = input("enter another mass in grams: ") |  |
| mass |  |
| unit = input("enter the units for mass: ") |  |
| print(mass, unit) |  |
| print(mass / 2) |  |
| ten = 10 |  |
| print(ten / 2) |  |
| abs(-1) |  |
| abs(-1 \* ten) |  |

List the names of the three functions used in the examples.

What are the arguments of the first use of the print function?

Type each line of code in a Python Shell, one line at a time, and write the corresponding output (if observed) in the right column of the table. If an error occurs, write what type of error it was (i.e., the first word of the last line of the error message).

Place an asterisk ( \* ) next to any output for which you were surprised, and note what was unexpected about the output. Don’t worry yet about *understanding* any strange output you may see; we will discuss what it all means by the end of class.

Which function delayed execution until additional input was entered?

Which term, *user* or *programmer*, best defines the role of the person who entered the additional input? Explain.

Based on the Shell output, what does the word mass represent, and how did it get its value?

What does the word ten represent, and how did it get its value?

Do the values of mass and ten both represent a number? Explain why or why not.