Values and Types

1) Following are several statements. Write the output of each statement.
   a) `print(type(64))`

   b) `print(type(“Values and Types”))`

   c) `print(type(“273.8”))`

   d) `print(type(5.6 + 8))`

2) Why do we use types?

Expressions

1) Following are several print statements with expressions. Write the output of each statement.
   a) `print(2+3)`

   b) `print(“Happy” + “Birthday”)`
Integer Type and Operators

1) What are the outputs of the following?
   a) `print(-20 + 2 * 2 - 16)`

   b) `print(18 % 4)`

   c) `print(18 / 6 * 2)`

   d) `print(4 + 2 ** 2 ** 3)`

String Type and Operators

1) What are the outputs of the following?
   a) `print("Go" + "Team!" * 3)`

   b) `print("Yes No Maybe" - "Maybe")`

   c) `print("day\night")`
Conversion

1) Sometimes we need to convert types. What is the output of each of the following?
   a) \texttt{print(type(int("23")))}

   b) \texttt{print(type(str(14)))}

   c) \texttt{print(int(67.984))}

   d) \texttt{print(type(float("64")))}

   e) \texttt{print(int("55.7"))}

Variables & Assignment

1) Below is a program that prints out the number of copies of the book, \textit{The Sixth Extinction}, that are available through the library. Written with python statements we’ve seen so far.

   \begin{verbatim}
   print("Copies in CASE library: 2")
   print("Copies in Cooley library: 1")
   print("Copies at Pace library: 3")
   print("There are", 3, "copies available at Colgate.")
   print("There are", 6, "copies available in total.")
   \end{verbatim}

   a) Describe how the code must be changed if CASE library buys two more copies to accommodate requests due to the book being in the Colgate 2017 Living Writers Series?
2) The code is rewritten as follows:

```python
# number of copies at libraries
copies_CASE = 2  # copies at CASE
copies_Cooley = 1  # copies at Cooley
copies_Pace = 3  # copies at Pace

print("Copies in CASE library: ", copies_CASE)
print("Copies in Cooley library: ", copies_Cooley)
print("Copies at Pace library: ", copies_Pace)

copies_Colgate = copies_CASE + copies_Cooley
total_copies = copies_Colgate + copies_Pace
print("There are ", copies_Colgate, " copies available at Colgate.")
print("There are", total_copies, " copies available in total.")
```

a) How must the code be changed if CASE buys two more copies now?

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**Assigning Variables**

1) What are the values of c and d after the following code is executed?

```python
a = 6 * 2
b = 4/2
c = a
d = a + b
```

2) What is the problem with each of the following code fragments?

   a) `12 = 4 * 3`

   b) `1dozen = 12`

   c) `print = 23`

       ```python
       print("hello")
       ```
Reassigning and Updating Variables

1) How do variables work? Consider the following code:

```python
age = 7
name = "Susan"
time = 23.1
```

The first statement established the value ‘7’, stored the value ‘7’ at a memory location and uses the name ‘age’ to reference that memory location. Let’s go through the other two together.

a) If the next three lines of code in the program above are:

```python
swimmer = name
name = "Susanna"
print(swimmer)
```

What is the output of the print statement? Why?

b) If the next two lines of code were:

```python
age = age + 1;
print(age)
```

What is the output of the print statement? Why?
Coding with Variables

1) Write a short program that calculates and displays the square of the number 8. Your program should start by assigning the integer value 8 to a variable. The end result of the program should be a printed sentence that states: “8 squared is equal to 64.”. When you are done compare your code to your neighbor’s. Do they both work? Are there any differences? What are they? If they are the same can you think of another way to write the same code.

2) Write a short program to calculate and display the area of a triangle with a base measurement of 3 and a height measurement of 3.