CS-521 Homework Assignment 1

**Instructions**

* Please read the Assignment Directions below.

**Assignment Directions**

Answer the following questions in this document (drawn from pages 78 – 79 in the text)

1. What is a program?

* A program is a human-readable essay on problem solving that is also executable on a computer. It consists of a set of instructions that are executed sequentially one after the other in the way they are typed.

1. Python is an interpreted language. What does “interpreted” mean in this context?

* “Interpreted” in this content means that a program within Python takes each line of the Python code, one at a time, and then executes that code entirely and list all possible errors at a time.

1. What is a Python *comment?* How do you indicate a comment? What purpose do they serve?

* A python comment is a line after the pound (#) character in the code that is written for the human reader, it is ignored by the Python interpreter. A comment can improve the readability of the code. A comment can be indicated by a type of comment known as the single-line comment (#). They exist to make the code easier to understand for humans.

1. What is a *namespace* in Python?

* A namespace in Python is a special structure maintained by the interpreter and used to keep the list of names and their associated values. It is a relation between names and objects. A namespace is used to determine what object is associated with a variable.

1. Whitespace:
   1. What is whitespace in Python?

* In term of Python, Whitespace are spaces composed as the space, tab, return, linefeed, formfeed, and vertical tab character
  1. When does whitespace matter?
* Whitespace matters at the beginning of a line called indentation. Leading (Indentation) whitespace are required for grouping.
  1. When does whitespace not matter?
* Whitespace does not matter within statements and expressions, and blank lines which are ignored but allowed.

1. Explain the difference between a statement and an expression. Give an example of both and explain what is meant by a statement having a *side effect.*

* A statement does not return a value but does perform some task. As a result of their operation, a statement may have a side effect. A side effect is some change that results from executing the statement. For example, my\_int = 5 is a statement but after the execution of the line, there is no return value but my\_int will now have a value of 5. This shows a side effect of a statement.
* An expression is a combination of values and operations that creates a new value that we call a return value, that is, the value returned by the operation. For example, the expression x + 5 will display 7 if the value of x is 2. The value associated with x is not changed as a result of this operations. Expression does not contain a statement.

1. Mixed operations:
   1. What type results when you divide an integer by a float? A float by an integer?

* Dividing an integer by a float and a float by an integer will result in a float.
  1. Explain why that resulting type makes sense (as opposed to some other type).
* The resulting type makes sense as opposed to some other type because the division operation is a little different than the other operations. Dividing two integers could lead to either an integer or a rational number so when a division operation is used, Python returns a float.

1. Consider integer values of a, b, and c, and the expression (a + b) \* c. In mathematics, we can substitute square brackets, [], or curly braces, {}, for parentheses, (). Is that same substitution valid in Python? Try it.

* It is not a valid substitution of square brackets [] or curly braces {} instead of parentheses () in Python. For example, with a=3, b=4, and c=5, I got the following results:
  1. (a+b)\*c 🡪 35
  2. {a+b}\*c 🡪 TypeError: unsupported operand type(s) for \*: ‘set’ and ‘int’
  3. [a+b]\*c 🡪 [7, 7, 7, 7, 7]

1. Assignment:

my\_int = 5  
my\_int = my\_int + 3  
print(my\_int)

* 1. If you execute the three lines of code above, what will be printed?   
     Explain your answer using the rules of assignment.
* Executing the three lines of code printed out “8”. Using the rules of assignment, the first line stores the value 5 to the variable my\_int. The second line adds the value 3 with the variable my\_int and stores the result into the same variable my\_int. Thus, the new value of the variable my\_int will be 5+3=8. Therefore, the printed result is “8”.
  1. Rewrite the line my\_int = my\_int + 3 using the += symbol

my\_int = 5

my\_int += 3

print(my\_int)

* Executing the three lines of code with the new line my\_int += 3, the result will print “8”. The first line stores the value 5 to the variable my\_int. The second line with the new line of code will add the value 3 with the variable my\_int and stores the result into the same variable my\_int but the only different is that the expression “+=” represent the addition operations. Thus, the new value with the new line of the variable my\_int will be 5+3=8. Therefore, the printed result is “8”.

1. Assignment:  
     
    my\_var1 = 7.0  
    my\_var2 = 5  
    print(my\_var1 % my\_var2)  
     
   If you execute these three lines of code, what will be printed?

* Executing these three lines of code printed the output of “2.0”.

**Where to submit?**

Click Assignments in the Navigation Area and then click on the title of the assignment to enter the submission area and upload your response.