CS 3035, Fall 2022
In-Lab Exercise 13
Due: October 5, 2022 (11:59 PM midnight)

Today's lab has three parts. For each part, please answer the questions in red and paste screenshots of your output wherever asked. Like lab 12, this is a discussion-based lab and 20 minutes at the end of the lab will be reserved for small group discussions among your group. You may update your answers based on your group discussion but you are still required to make individual submissions on Canvas.

Part 1: Lists

Please conduct this part using the Python Interpreter Shell

1. Create a simple list L1 containing 5 strings. Example: L1 = ['spam', 'eggs', 'ham', 'toast', 'muffin']
2. Create a second list L2 as '`L2 = L1`'. For …
3. Replace the list items at offset 1 and 2 with 2 different values ***in-place using a single statement.*** You may use any other numbers as the replacements.
   i. Paste a screenshot of the statement you used and the output.
   ii. Print L2 to see if the mutability of lists in maintained when you make this change.
4. Now, replace the list items at offset 1 and 2 with **4** different numbers ***in-place using a single statement.*** You may use any other numbers as the replacements. The final length of L1 after you execute this statement should be 7.
   i. Paste a screenshot of the statement you used and the output.
   ii. Print L2 to see if the mutability of lists in maintained when you make this change.
5. The 'sort' method applies to lists and is used to sort a list in ascending order by default. Other orders are also possible but we will use the default order. To use the sort function on L1, use '`L1.sort()`'. This will sort L1 but give you no output. To see the output, print L1.
   i. Paste a screenshot of the statement you used and the output.
   ii. Print L2 to see if the mutability of lists in maintained when you make this change.
   iii. Re-assign L1 with some of the strings starting with an upper-case. Example: L1 = ['Spam', 'eggs', 'Ham', 'toast', 'muffin'].
      i. What happens if you sort this list using the sort() function?
      ii. What observations can you make about the sorting method that the sort() function uses?
      iii. Would a sort method work if a list comprised multiple data types?

Part 2: Dictionary

Please conduct this part using the Python Interpreter Shell

1. We are going to use a dictionary type to store 3 records in this example. You may use any records that adhere to the following record-keeping style:

   Dictionary = {Key1:[Value[0], Value[1], Value[2]], Key2:[Value[0], Value[1], Value[2]], Key3: [Value[0], Value[1], Value[2]]}

   An example of this is movieDB that we discussed in class today.

i. Paste a screenshot of the dictionary you created.
ii. Store all keys from the dictionary in a list using the list() and keys() methods.
iii. Write a comprehension statement that helps you find the correct key from your dictionary by using a known value. An example of this is shown in slide 18 of today's class material.
    i. Paste a screenshot of your comprehension statement and its output

Part 3: Variable Scope in Python

Please conduct this part using the python script 'function.py' in the class git repository. This script is located in cs3035/python/week7 in the cs3035 folder of your Ubuntu machine.

We studied variable scope in C through local, function, and global variables. Modify the function.py code to test the scope of local, function, and global variables in Python. Write your observations for each of the following parts in 1-2 sentences.

i. In Python, does declaring global, local, and function variables follow the same rules as C?
ii. What happens when we declare the same variables both globally and locally?
iii. What happens when we declare the same functions both locally and within the function?
iv. Does python use static variables?