CS 112 Assignment 8a

Submit your finished code to the Dropbox. You will need to pass off the assignments with the TA or tutor during their office hours (their information is in the CS 112 Course Information section of the Table of Contents), or the instructor in class. Follow the formatting guide which is also found in the CS 112 Course Information section.

Read the instructions carefully. Make sure your output matches the example run.

Objectives:

In this assignment you will learn how to do the following:

- Call a function passing a list as an argument
- Begin to understand the difference between mutable and immutable data types
- Begin to understand how variables store mutable vs immutable data types

Program: Passing a list to sum()

Write a program that asks the user to enter numbers into a list. Allow the user to enter as many numbers as they want. Validate that each of these numbers is an integer. When the user is done entering numbers, they will hit the enter key at the prompt without entering any data.

Have your main() call a second function that you write called sum() passing the list as an argument. Your sum() function will add up all the numbers in the list and return the total back to main(). You must use a loop in your sum() function to add the numbers. Use of any Python function to add items in a list is not allowed.

Have you main() print out the list of numbers with each number's corresponding list index as show in the example run. Then have your main() print how many elements are in the list and their sum total.

After the program has finished, ask the user if they would like to play again. Use input validation to ensure the user answered with a 'Y' or 'N'. Keep the program running in an infinite loop until the user indicates they want to quit.

Key program requirements:

- Do input validation on all numbers in the list and the 'Y'/'N' play again question
- Populate a list of numbers with user input, allowing the user to decide how many numbers to enter.
- Write a function sum() which is called from main(), passing your list as an argument.
- Do not use any Python function to add items up in the list. You must program this yourself.
- Use of global variables is NOT allowed

Ponder – Discuss the following with your partner. Failure to do this activity and discuss these questions before you attempt to pass off your program will result in a failed pass off.

- On a separate piece of paper, draw boxes that represent the various memory locations that will be used by your program. MAKE SURE that you indicate which function the variables belong to.
- Discuss the difference between mutable and immutable data types.
- Since lists are mutable data types, how does this change your box representation of the memory locations you did in the Ponder bullet above compared to previous assignments?

Example Run

```
This program will ask the user to enter a series of numbers.
The user may enter as many numbers as they wish, hitting the enter key with no data
when they wish to stop.
The program will then display the list of numbers and the sum total of those numbers.

Please enter a number (or just hit enter to finish): 10
Please enter a number (or just hit enter to finish): 20
Please enter a number (or just hit enter to finish): 30
Please enter a number (or just hit enter to finish): 40
Please enter a number (or just hit enter to finish):

List Index      Item
   0          10
   1          20
   2          30
   3          40

There are 4 items in the list.
The sum total of numbers in the list is 100.

Would you like to play again? (Y/N): n
>>>
```