Lab Exercise 4

Focus

1. While loops and For loops
2. Count-controlled loops
3. Sentinel controlled loops

This lab maps to learning objectives 1 through 7 from Competency Module Four – Write a Working Program that Uses the Repetition Control Structure including the While Loop, the For Loop, and Nested Loops.

Part A: Building on an Existing Solution

For this portion of the lab, you will start by downloading the program **Lab4_feet_to_miles.py** from Blackboard. This program inputs a distance in feet and then displays the distance in miles. Before converting feet to miles, it performs input validation on the number of feet. If the input is invalid, it prints an error message and ends the program. Otherwise, it converts feet to miles and displays the result.

Your job is to redesign the solution so that some portions of the code are repeated. If the user enters an invalid number of feet, print an error message and ask the user to re-enter the feet. Keep repeating this code until the user enters a valid number of feet. Then continue with the conversion to miles and display the result.

Save your program as firstname_lastname_Lab4a.py where you will replace firstname and lastname with your actual first and last name.

Part B: Draw Something!

In this part of the lab you will draw an inverted triangle using nested loops. (LO 1.1, 1.2, 3, 5, 6)

Your triangle should have 10 rows of asterisks like this example:

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*********
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*

Save the program as firstname_lastname_Lab4b.py where you will replace firstname and lastname with your actual first and last name.

Part C: Building on an Existing Solution

Modify the program written in Lab 3 part B to include a loop. You will keep track of how many employees you have processed. You will input employees until the payroll manager enters a certain sentinel value to stop taking input. Use an “empty” name as a sentinel. In other words, the user should just press the Enter key when the program prompts for a name to signal the program to stop looping. (LO 1.1, 1.2, 4, 5, 6)

Your program will use loops and will accomplish the following:

1. Read in the name, hours worked, and hourly rate of an employee.
2. Calculate all the pay information from Lab 3 part B for each employee.
3. Keep a running total of the base salary (before deductions) for all employees.
4. Keep a count of the number of employees processed.
5. All input to the program will be from the keyboard.
6. For each employee, the program will output the employee name, gross salary, amount of each deduction, and the net salary.
7. After the program has processed all employees, it should display the number of employees processed and the total of the base salaries for all employees.

Use the IDLE programming environment if you are using Python with IDLE. Some of you may be using Komodo or some other Python IDE. Please save your file as firstname_lastname_Lab4c.py where you will replace firstname and lastname with your actual first name and last name. Remember to use the extension .py.

Run and test your program for all conditions. Once you are sure it works you will turn in the items listed in the next section.

Turn In

All labs will be graded in Blackboard. Once you are done with the lab turn it in using the Lab 4 link. If you have any questions about submitting please contact the instructor.