COSC 1336 Lab: 1

Relevant reading: Chapter 2

Due: Sep. 11, 2:30 pm

(Late date: Sep. 18, 2:30 pm)

50 Points

Problem 1. [**8 points**] Read through Problem #8 on p. 78 of the textbook. Download the file `tip_tax_total.py`, which contains a buggy implementation of the program described in the problem. At the top of the file, put a comment with your name in in. Then, also in a comment at the top, answer the following:

a. Based on the description of the program in the textbook, give a test case that you will use to test the program. That is, give an input and the outputs that you expect the program to produce in response to that input.

b. What happens when you run the program on your test case?

c. Now fix the program so that it runs correctly on your test case from part a. Briefly describe what you had to do to fix it, and why.

Problem 2. [**10 points**] Download the file `fahrenheit_to_celsius.py`. In it, you will find a buggy program that is intended to convert Fahrenheit temperatures to Celsius. The formula for converting the other way (Celsius to Fahrenheit) is

$$F = \frac{9}{5}C + 32$$

At the top of the file, put a comment with your name in it. Then put additional comments with the answers to the following questions:

a. Give an example of an input for which the program produces the wrong output. What is the program's output and what should it be?

b. Find and fix the bug(s) so that the program works correctly. For each bug you fix, write a short (1-2 sentence) description of the bug and how you fixed it.

Problem 3. [**14 points**] Read Problem #3 on p. 77 of the textbook. In IDLE, make a new file and save it on your H drive or your flash drive as `acre_calc.py`. In the file, implement the program described in the problem. Be sure to test your program adequately. For example, what does it output if the user enters `65475`? What should it output?

Problem 4. [**18 points**] In a file called `mpg_calc.py`, write a program that will help a driver calculate his or her car's gas mileage. It should read in the number of miles on the odometer at the beginning of a trip, the number of miles on the odometer at the end of the trip, and the number of gallons used during the trip. It should calculate the miles per gallon for the trip.

When you are finished with all the problems, make sure you have attached all the files and then click **Submit**. Remember that you can save each file as you complete it, but you must wait to submit until all files have been attached, as you can only submit once. For this lab you should submit the following:

- `tip_tax_total.py`
- `fahrenheit_to_celsius.py`
- `acre_calc.py`
- `mpg_calc.py`