Assignment number 6 for Computer Architecture

The assignment is to create a MIPS program that demonstrates that the associative law fails in addition for floating point numbers (single or double precision). You only need to demonstrate it for single precision. Remember the associative law is a + (b + c) = (a + b) + c.

For this assignment, turn in your code, a screenshot showing the output of a run of your program, and an observations file with comments about how much time you spent writing the program and what you learned doing it. As always, turn your assignment in using the class website DropBox for the assignment.

Make certain that you have your name and the assignment number at the top of your observations file as well as at the top of your code file. Also have a lot of comments in your program as this is an assembly language program. Make the code neat and readable.

This program is worth 10 points.

This program is due on Oct. 28.

Note that this is an individual assignment, you are not to work with someone on it. It is OK to ask for and to give some help for a problem within the assignment, but the work must be your own. Note that you may borrow code from any example programs that I have placed out on Canvas.

The program’s output should look something like the following where the xxx’s are the numbers you chose. The resulting numbers may be different than mine depending on your choice of a, b, and c.

Using a = xxx, b = xxx, and c = xxx

a + (b + c) = 0

(a + b) + c = 1

The key is to have two of the number large (one positively and one negatively but equal in magnitude) floating point numbers and the third floating point number very small in comparison.

As a side note, the associative law will also fail for multiplication for floating point numbers, but you do not need to demonstrate that.