

Computer Science 210 –Computer Organization

Homework Exercise 5 Due on Github 11:59 PM, Wednesday 2 March

Your turn in will consist of four assembly language source files. Place these files in a **project5** folder.

If you use the Windows version of LC3, you can create and edit your programs with the LC3Edit application. If you use Linux or a Mac, you can use a text editor, like TextEdit, Editra, or gEdit, and test your programs in the online LC3 Simulator. In either case, your source files should be appropriately named and have a **.asm** extension (example: **ex1.asm**).

Read the style guidelines for programming in assembly language. *All of your programs must conform to these guidelines.*

Each program will assume that you have manually loaded data into the appropriate variables before execution.

Each program should conclude with a **HALT** instruction. You may set a breakpoint here during testing to observe the results in the registers and variables.

You should test each program with several sets of data.

You should try to use the minimal number of instructions necessary to solve a problem.

The Exercises

1. Write a program that subtracts the number in the variable **SECOND** from the number in the variable **FIRST** and stores the result in the variable **DIFF**.
2. Write a program that computes the sum of 5 numbers in the array named **LIST** and stores this sum in the variable named **SUM**. You must use a loop for this computation!
3. Write a program that performs multiplication. The program should multiply the numbers in the variables **FIRST** and **SECOND** and store the result in the variable **PRODUCT**.
4. Write a program that manipulates the numbers in the two variables **SMALLER** and **LARGER**. When the program halts, **SMALLER** should be \leq **LARGER**. In other words, you might have to swap the values of these two variables. You should test this program with data that exercise the three possible initial relationships between the two numbers.