

CS270 Recitation 8 “LC-3 Programming Practice”

Goals

Practice LC-3 programming and improve your understanding of the LC-3 machine.

The Recitation:

Make a subdirectory called R8 for the recitation and download the following file:

<http://www.cs.colostate.edu/~cs270/.Spring12/Recitations/R8/squareof.asm>

Use this file to write an assembly program that takes a 16-bit 2's complement number as input and computes the square of this number. The input number is stored in a variable called **INPUT** and the output must be stored back into a variable called **INSQUARE**. To accomplish the task, you need to write and use a subroutine to multiply two 2's complement numbers. The specification for this subroutine is as follows:

Subroutine:

Name: **MULTIPLY**
Input: **MULTPLICAND, MULTIPLIER**
Output: **RESULT**

The subroutine **MULTIPLY** takes two 2's complement numbers and multiplies them using repeated addition or—for a challenge—try the subroutine using left shift operations to achieve a more efficient implementation,,,. The multiplicand is stored in a variable called **MULTPLICAND** and the multiplier is stored in a variable called **MULTIPLIER**. The result must be stored back into a variable called **RESULT**.

Use the lc3 simulator and provided file to test your program and the subroutine independently. Remember—your program and subroutine must work for both positive and negative values (i.e., 2's complement numbers) for **INPUT**, **MULTPLICAND**, and **MULTIPLIER**.

We covered a simple case of multiplication in class (lecture 12 - chp7). However, we recommend you to try to write this program from scratch so you can learn how to write an LC-3 assembly program from start to finish.