Programming Assignment 1
Due: Midnight - 22nd October, 2003

Instructions

Name your file program1.bin

Write your name at the beginning of the program file you submit. You will be penalized if you don’t. Be sure to write it as a comment, like so

; Last name, First name

No late submissions will be accepted. So make sure you start early.

Programs you submit must be your own work. You may discuss algorithms with your classmates. You may not discuss your program with others. Do not show your code to any of your fellow students. Plagiarism of any kind will not be tolerated.

Inches to Centimeters Conversion

Say we want to convert an integer length given in inches to centimeters. The scaling factor is approximately 2.54. We can’t use this with the LC-3 since it does not support floating point arithmetic. We can, however, use the scaling factor of 33/13 (which is also more accurate). The value in inches is first multiplied by 33 and then divided by 13. The result will obviously be a mixed fraction of the form $x \frac{y}{13}$; $x$ is the quotient of the division and $y$ is the remainder.

For example,

1 inch = (1*33)/13 = 2 $\frac{7}{13}$

42 inches = (42*33)/13 = 106 $\frac{6}{13}$

Assignment Description

You will write a program that converts a length in inches ($I$) to centimeters using the conversion formula described above.
$I_{in} = x^\frac{y}{13}$ cm

$I$ is a source in memory and $x$ and $y$ are destinations in memory. Your program will have to load the value $I$ into some register, do the necessary conversion, and store the two part result back in memory.

The program should be written in machine language. You should, however, write sufficient comments so we can figure out your implementation. We will not assign any partial credit if we can’t readily understand/debug your code.

**Specifications**
Your program should start at location x3000.
$I$ is stored in location x3050.
The integer part of the result ($x$) should be stored at location x3051 while $y$ should be stored at x3052.
You should assume that $I$ is already stored in location x3050. You may also assume that $I > 0$.

**Testing your Program**
Test your program. Manually load values into location x3050 and then run your code. Make sure you get the correct results in locations x3051 and x3052.

Check out the software and documentation link on the class webpage for submission instructions.