

CS 61 - Programming Assignment 01

Objective

The purpose of this assignment is to familiarize students with the basics of LC3 assembly language programming, the SIMPL simulator, and rudimentary debugging

Your Tasks

Implement the LC3 program from the picture below.

Note: This is similar to the program in Lab 01 that used a DO-WHILE loop to multiply two numbers together.

Once you have the program coded and saved to the **provided template** “asn1.asm”, return to the terminal and load the program into the SIMPL simulator by typing:-

```
simpl asn1.asm
```

When the simulator opens, place a breakpoint at the beginning of the DO-WHILE loop by right-mouse-clicking that line of code and selecting “Mark as Breakpoint”.

Lastly, create a table of values for each register for

- Before the loop
- Each iteration of the loop
- At the end of the program’s execution

Record the table as a block of comments beneath your header and above the actual LC3 code.

Feel free to steal the format of the table below. Obviously, replace each “x” in the table with the actual value of the register :)

The following program performs the action: $R3 \leftarrow 6 * 12$ (i.e. multiply 6 by 12 and write the result into Register 3) using a DO-WHILE loop:

```

;-----
; Name: Hayao Miyazaki
; Login: hayam
; Email address: hayam@cs.ucr.edu
; Assignment: assn1
; Lab Section: <021 or 022>
; TA: Sean Foley
;
; I attest that this code was totally given
; to me and that I didn't come up with
; any of it =P
;-----

;-----
; REG VALUES      R0  R1  R2  R3  R4  R5  R6  R7
;-----
; Pre-loop         x   x   x   x   x   x   x   x
; Iteration 01     x   x   x   x   x   x   x   x
; Iteration 02     x   x   x   x   x   x   x   x
; ...
; Iteration n      x   x   x   x   x   x   x   x
; End of program   x   x   x   x   x   x   x   x
;-----

.ORIG x3000                                ; Program begins here
;-----
; Instructions
;-----
LD  R1, DEC_6                               ; R1 ← 6
LD  R2, DEC_12                              ; R2 ← 12
LD  R3, DEC_0                               ; R3 ← 0

DO_WHILE  ADD R3, R3, R2  ; R3 ← R3 + R2
          ADD R1, R1, #-1 ; R1 ← R1 - 1
          BRp DO_WHILE   ; if ( LMR > 0 ) goto DO_WHILE

HALT                                           ; Terminate the program
;-----
; Data
;-----
DEC_0  .FILL    #0      ; Put the value 0 into memory here
DEC_6  .FILL    #6      ; Put the value 6 into memory here
DEC_12 .FILL    #12     ; Put the value 12 into memory here

.END

```

Uh...help?

- Beginner's Guide to Linux/Unix
 - <http://www.ee.surrey.ac.uk/Teaching/Unix/index.html>

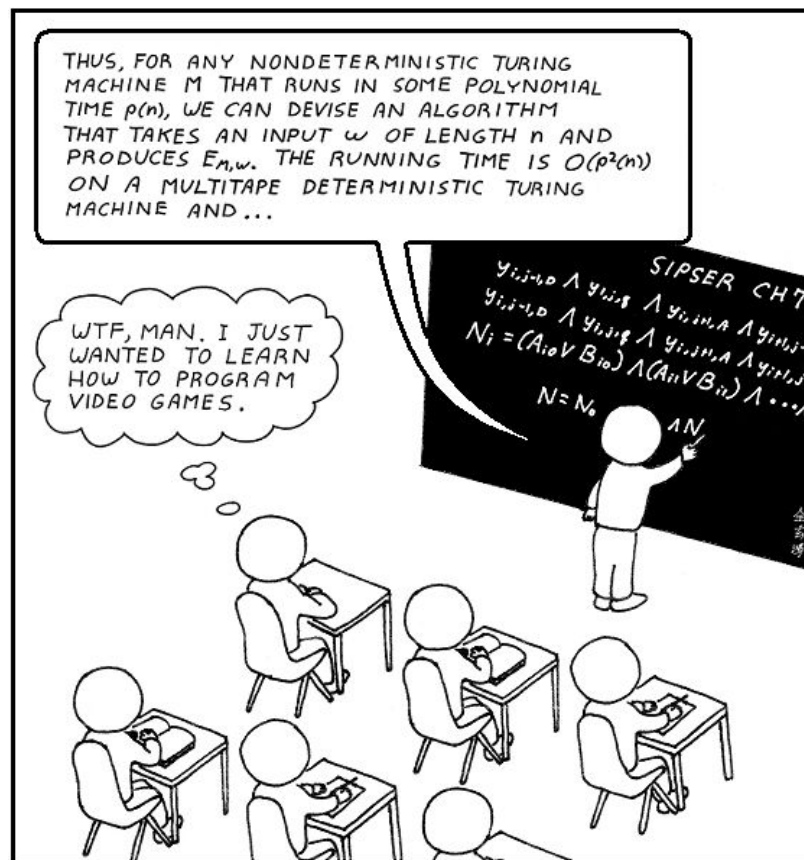
Submission Instructions

Submit to GitHub as we taught you in lab.

Rubric

- There is nothing for you to actually get wrong in this assignment (we give you the code!) - so the only way to mess up and lose points would be to fail to follow our instructions :)
- This assignment has to be graded manually (i.e. we have to look at your code formatting and your step table). Your grades will be posted to iLearn.
- For this and all assignments, use of the template given to you in the GitHub repo is **required**.

Comics??!Sweet!!!



Source: http://tweets2blog.files.wordpress.com/2009/11/computer_science_major.png?w=561&h=595