CS 366: Programming Assignment 4

Multiplier Using MythSim

Due: 16 Nov 2005, 11:59 AM

New Micro-codes   As part of this assignment you are expected to write micro-code for the following 4 instructions:

Instruction	Meaning
LDM ri, OFFSET(rj)	ri ← MEM[rj + OFFSET]
SWM ri, OFFSET(rj)	ri → MEM[rj + OFFSET]
ADDM ri, rj, OFFSET(rk)	ri ← rj + MEM[rk + OFFSET]
SUBM ri, rj, OFFSET(rk)	ri ← rj - MEM[rk + OFFSET]

Feel free to write any other basic instruction (like branch, add etc) that would be necessary to complete the multiplier program described below.

Multiplier (through repeated addition)   Write a program that multiplies two numbers stored in memory and stores the result back in memory. The multiplication is done by repeated addition:

RESULT := 0
for 1 to MULTIPLIER do
  RESULT := RESULT + MULTIPLICAND;

Arrange the values in the .mem file such that the data (the multiplicand, the multiplier and space for the result) are stored after the text for the multiplier program as shown below.

Sample code (contents of .mem file)	
	...
X :	LDM r0, r2, 0
X+2 :	LDM r1, r2, 1
	...
	...
N-2 :	SWM r0, r2, 2
N :	HALT
N+1 :	MULTIPLICAND (say 100)
N+2 :	MULTIPLIER (say 10)
N+3 :	RESULT

assuming r2 is initialized (by you!) to the address N+1.

Turnin The command for the electronic turnin is:

$$\texttt{turnin -c cs366 -p myth\_mult } \langle files \rangle$$

The hard-copy should contain

- a listing of your .ucode and .mem file (with some comments)

- a table with all the opcodes (you wrote) in the .ucode file and having a description for each opcode similar in style to the table given above

- the status of your implementation (what works and what doesn't)

This is due in class.