

EE424 Computer Architecture Lab 1: SPIM

Spring 2003

The objective of this first lab is for you to use SPIM which is a simulator that runs MIPS R2000/R3000 assembly language programs. In this lab, you are going to use some of the basic features of SPIM. In order to work with SPIM, you need to read the 2-page tutorial.

If you have access to a PC, please get a copy of the software. Otherwise you could use the SUN machines in room EME128. You should have an account for this system, please check if you have it (go to EME128 and try to login).

Below is a program that you will use for this lab. It is a very simple program but it will help you to get familiar with SPIM.

```
1          .data
2  str:
3          .asciiz "the sum is: "
4          .text
5
6          li  $a0, 6      # initialize argument 0
7          li  $a1, 5      # initialize argument 1
8
9  sum:    beq  $a0, $zero, sum_exit # compare argument 0 = 0
10         add  $a1, $a1, $a0      # add arguments
11         addi $a0, $a0, -1       # a0 - 1
12         j    sum                # unconditional jump to sum
13
14 sum_exit: li  $v0, 4           # syscall code for print_string
15         la  $a0, str          # argument for system call
16         syscall
17         move $a0, $a1         # argument for system call
18         li  $v0, 1           # syscall code for print_integer
19         syscall
```

Last two digits of your
WSU ID number: 10451156

Please do the following:

- 1) Modify the program by changing the values of argument a0 and a1 (see lines 6 and 7). Replace these arguments with the last two digits of your WSU ID number (if one of them is zero use the following digit). a0 would have the last (non-zero) digit.
- 2) Run the program (use *Go* command)
- 3) Using *File* → *Save Log File...* (*Ctrl+S*) save the file. This file would have the status of all the registers and memory after the execution of the program. Please print this file; this will be part of your report for this lab.
- 4) Now replace the values for arguments a0 and a1 with 2 and 4, respectively. Remember you need to edit the program file again. Run the program using a step by step option (*F10*). Please notice when registers R4, R5, and R6 change and how PC changes every time.
- 5) Reload the program and insert a break point at line 11. Run the program (use *Go* command). Please take a look of what happened with the instructions in line 11 and report the values of the following registers R4, R5, and R6.
- 6) Using *File* → *Save Log File...* (*Ctrl+S*) save the file. Please print this file and include it in your lab report.