EE 443
Computer Engineering Analysis and Design Laboratory
Lab 0
1/20/2015

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Lab Participation

Provide the percent participation in lab by each lab partner (if you feel each partner did equal work, enter 50% for each partner):

Lab member name	Percent participation
Shane Tachick	100

Does your solution work the way it's supposed to work? YES

[1] If your answer is NO, please explain in your report.

Instructor/TA comments and grading

Objective and Background

The objective of this lab is to familiarize us with MIPS assembly language and introduce us to the methods used for calling new procedures while properly saving the stack pointer and then returning from that procedure properly.

Equipment

Hardware: Computer capable of running a MIPS compiler.
Software: MARS 4.5

Procedure

I wrote the desired code in the MARS 4.5 software which allowed me to easily step through my program to detect any bugs while I created the program.

Results

I wrote a program that allows the user to specify an array of a certain size, the user then fills that array. Once the array is filled the program inverts the array in place, and then calculates the average of all the elements in the array. The average is then output to the user and finally the inverted array is output to the user.

Discussion and Questions

What is the contents of the register $ra?
Return Address
What is the contents of the register $pc?
Program Counter, the next instruction to be executed
What is the contents of the register $sp?
Stack Pointers, contains information about the top of the stack (hopefully)
What is the contents of all the general purpose registers affected by the program?
Hopefully they are the values that I initialized them to be or have been modified properly according to the program.
What is on the stack?
The stack contains information about return addresses and anything else that has been ‘pushed’ onto it.

Pick one conditional branch instruction from your program and answer the following questions:
What is the address of that instruction?
0x004000a0
What is the address of the instruction that is the target of your conditional branch instruction?
0x00400078

How was the conditional instruction compiled? What is the value of the immediate field in that instruction?

bgtz $14, -11

$t6 is 4 (it is a counter counting down the array size)

Conclusion

This lab reinforced the importance of checking the functionality of your code while you create it, instead of attempting to debug it all at the end. This lab also helped familiarize myself with MIPS instructions.

Attachments

Lab2.asm