1 Administrivia

Announcements

Assignment

Read 3.6.

From Last Time

Intro to Unix.

Outline

1. Using SPIM.

2. Lab exercise.

Coming Up

Procedure calls in assembly.
2 Using SPIM

Things to notice:

1. Structure of a MIPS assembly language program.

2. System calls: \texttt{syscall}. Exit from your program:

\begin{verbatim}
li $v0, 10
syscall
\end{verbatim}

3. I/O:

(a) Reading an integer.

(b) Writing a string or integer.

4. Debugging:

(a) Creating global labels with \texttt{.globl}.

(b) Setting and hitting breakpoints. Continuing from a breakpoint.

(c) Printing register values.

Example:

\begin{verbatim}
# addn.spim
# Input: A number of inputs, \textit{n}, and \textit{n} integers.
# Output: The sum of the \textit{n} inputs.
# Demonstrates reading and writing integers.

# Register usage:
# $t0$: how many integers remain to be read.
# $t1$: sum of the integers read so far.

.data # Constants.
prmpt1: .asciiz "How many inputs? "
\end{verbatim}
.text
.globl main

main:
    li $v0, 4 # Syscall to print prompt string.
    la $a0, prmpt1
    syscall

    li $v0, 5 # Syscall to read an integer.
    syscall
    move $t0, $v0 # n stored in $t0.

    li $t1, 0 # sum stored in $t1 -- clear it.

.globl while

while:
    blez $t0, endwhile # Read n integers.
    li $v0, 4 # Prompt for next integer
    la $a0, prmpt2
    syscall

    li $v0, 5 # Read next integer.
    syscall
    add $t1, $t1, $v0 # Increase sum by new input.

    sub $t0, $t0, 1 # Decrement n.
    b while

.endwhile:
    li $v0, 4 # Print result string.
    la $a0, sum
    syscall

    move $a0, $t1 # Print sum.
    li $v0, 1
    syscall

    li $v0, 4 # Print a newline character.
    la $a0, nl
    syscall

    li $v0, 10 # Syscall to exit.
    syscall
3 Lab Exercise

See lab handout.