

Lab 7

Processors: Learn A RISC Assembly Language

Purpose

To gain first-hand experience with an assembly language and understand the one-to-one mapping between assembly language instructions and machine instructions.

Background Reading And Preparation

Read Chapters 4 through 6 and 8 to learn the concepts of instruction sets and operand types. Read about the specific instruction set available on your local computer. Consult the assembler reference manual to learn the syntax conventions needed for the assembler. Also read the assembler reference manual to determine the conventions used to call an external procedure.

Overview

Write an assembly language program that shifts an integer value to the right and then calls a C procedure to display the resulting value in hexadecimal.

Procedure And Details (checkmark as each is completed)

- 1. Write a C procedure, *int_out*, that takes an integer argument and uses *printf* to display the argument value in hexadecimal.
- 2. Test the procedure to ensure it works correctly.
- 3. Write an assembly language program that places the integer 4 in a register, shifts the contents of the register right one bit.
- 4. Extend the program to pass the result of the previous step as an argument to external procedure *int_out*.
- 5. Verify that the program produces 0x2 as the output.

- 6. Instead of using 4 as the initial integer, use 0xBD5A, and verify that the output is correct.

Optional Extensions (checkmark as each is completed)

- 7. Rewrite the external procedure *int_out* and the assembly language program to pass multiple arguments.
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Notes