

22C:060: Computer Organization

Spring 2008

Assignment 3

Total points = 50

Assigned Feb 26, due March 11, 2008, 11:59:59 PM

Instructions to prepare and submit your homework

1. Explain the general plan of each program using a **readme** file
2. Be generous about using comments to improve readability. This includes a comment at the beginning of the program.
3. To submit the program, *zip* (or *tar*) them into a single file, and submit it to ICON drop box

Question 1 (20 points)

Use the SPIM simulator to implement a recursive procedure that calculates the **n**th Fibonacci number **fib(n)**. Recall that **fib(0) = 0**, **fib(1) = 1**. Further elements of this sequence can be calculated by **fib(n) = fib(n-1) + fib(n-2)**.

The main procedure will prompt the user to input **n**. Then it will call the recursive procedure **fib(n)**. As a recursive procedure, **fib** has to store the return address on the stack. It will also store the registers **\$s0** and **\$a0**. The purpose of these registers is to store intermediate results; **\$s0** will contain **fib(n - 1)**, and **\$a0** keeps track of the arguments. In the final step, your program will print the value of **fib(n)**

Question 2 (30 points)

Part 1. Using the SPIM simulator, write a function ONETWO to simulate a 1-to-2 decoder (shown below) with one primary input X, one enable input E, and two outputs ZERO and ONE.



