

Lab 1

Introduction

In this take home lab, you will be writing assembly language programs that compute Fibonacci numbers. The basic MIPS assembly language instructions should be familiar to you after reading Chapter 2 of *Computer Organization and Design*. Refer to Appendix A for a complete list of all the available instructions along with descriptions of their functions.

Fibonacci Numbers

Recall that each number in the Fibonacci series is the sum of the previous two numbers. Here are the first few numbers in the series:

n	0	1	2	3	4	5
Fibonacci of n	0	1	1	2	3	5

To execute the fib program that you write, you will be using the QtSpim or Mars application. They allow you to step through one line of code at a time while displaying the values of all registers and memory, so that you can watch what the program is doing and catch any bugs that appear.

Writing the Code

Write a recursive implementation of Fibonacci numbers in MIPS. For a template for the assembly program that you should write refer to QtSPIM lecture notes available on the Avenue to Learn.

Use a text editor to enter this code into a text file named `fib0_xx.asm` (where `xx` are your initials). The n argument to the fib function should be loaded into register `$a0`. Test your program for $n=5$ and $n=8$. Your code should leave the resulting value of `fib(n)` in register `$v0`.

Comments begin with the '#' character and continue to the end of the line. You should use comments to include your name and the date at the top of the file. Please add comments to your code, explaining clearly what the code does. Follow the steps explained during SPIM lecture (available on the Avenue to Learn) and run your project on the SPIM or Mars. Use system calls if required. Submit your results and your code by February 13th. You may upload your project electronically to the Avenue to Learn drop-box.