CS220: Lab#11A

- All problems must be solved using MIPS assembly language programs. The programs should be tested using SPIM.
- Please refer to the SPIM commands and introduction to SPIM handouts already posted on course webpage. Additionally, Sections A.9 and A.10 from Appendix A of Patterson and Hennessy have all details regarding SPIM.
- Use of pseudo-instructions supported by SPIM is allowed.
- When you enter a value from keyboard, make sure to press "ENTER" after entering the value; otherwise the system call layer will not accept the input. As a result, when entering an array of values, please enter them one per line.

1. [6 marks] Write a recursive function to compute the n^{th} Fibonacci number. Write a `main` function that accepts an integer `n` as input (from keyboard) and prints the first n Fibonacci numbers on the display as a comma separated series i.e., 1, 1, 2, 3, 5, 8, 13, 21, ... Your program must work correctly for arbitrary values of n. Try your program for $n = 10, 20, 30$ and verify the output from internet e.g., from `http://www.maths.surrey.ac.uk/hosted-sites/R.Knott/Fibonacci/fibtable.html`.

2. [4 marks] Take an integer n and two single-precision floating-point n-dimensional vectors $A = (a_{n-1}, a_{n-2}, \ldots, a_0)$ and $B = (b_{n-1}, b_{n-2}, \ldots, b_0)$ as inputs. Compute $\sum_{i=0}^{n-1} a_i b_i$ using a MIPS assembly language program. The final single-precision floating-point result should be printed on the display. Allocate space for A and B statically and assume that $n \leq 15$.