Programming Assignment 2: MIPS Simulator

Total Marks: 50

In this assignment, you would write a simple MIPS simulator, a program that can simulate the execution of MIPS instruction. Your simulator should support the following 2 modes. Assume that you have an instruction "*halt*" at the end of the program.

1) Execution Mode – The program execute from the beginning until "*halt*" instruction in encountered.

2) Step-by-Step Mode – The program shows the status of all the registers and memory after execution of each instruction.

The following MIPS instructions should be simulated.

- ✓ Arithmetic: ***add, addi, sub, mul***
- ✓ Logic: ***and, andi, or, ori, nor***
- ✓ Comparison: ***slt, slti***
- ✓ Load/Store: ***lw, sw***
- ✓ Control flow: ***beq, bne, j***
- ✓ ***halt***

Program input:

Input to your program is the assembler program that contains your main code. No need to implement system calls. You need to test your simulator using at least 3 sample MIPS code. All the instructions given above should be tested by your sample programs. Each program need not test all the instructions. The instructions given above should be present at least once in any of the sample programs.

Output:

Your program should show the status of all the registers and memory after the program halts.

General Instructions:

1. You can use any high level programming language to implement your simulator.
2. No need to convert the assembly language to machine language code.
3. You can get partial marks based on partial completeness of your simulator as given below.

   a. Implementation of arithmetic & logical Instructions (15 Marks)
   b. Implementation of load/store instructions. (10 Marks)
   c. Implementation of comparison and control flow instructions (15 Marks)
4. Overall simulator implementation including visualization of output carries 10 Marks

Submission Detail: Submit a project report with all your source codes in a .zip file in Google Classroom.
Due Date: 5-10-2016, 11:59 pm
Late Submission Penalty: 20% for each late day (including weekend)