Homework1 for Computer Organization

(Total 100 points)

Submission Deadline: April 30, 11:59pm

Programming to implement a MIPS assembler and dissembler. We will check your program with your single-cycle CPU. Detail information about the assembler and dissembler, please see the file in the material directory on course website.

* Base requirement:
  + Supporting the following 18 MIPS instructions: Add, Sub, And, Or, Addi, Ori, Sll，Srl，Lw, Sw, Lui, Slt, Slti, Beq, Bne, J, Jal, Jr.
  + input a MIPS assembly program, output its MIPS machine code in hexadecimal code.
  + Input a MIPS machine code in hexadecimal code, output its MIPS assembly program with PC value.
* Strong requirement:
  + Implement a graphical user Interface for your program.
  + Supporing pseudo instructions: Bgt, Bge, Blt, Ble, move,
* Stronger functions:
  + Supporting more instructions such as: Xor, Nor, Sra, Xori, Lb, Sb, Lh, SW, Jalr, ……
  + Simulate execution of the MIPS assembly program in step-by-step way with a window to show the values of registers.
  + Simulate execution of the MIPS assembly program from the current MIPS instruction to the end and with a window to show the values of registers.
  + With reset to initialize the simulation.

NOTE:

It would be checked with your single-cycle-CPU;

Use your assembler to translate a MIPS program into a correspond machine code, and even into .coe file which can be load into a ROM and be executed on your CPU.

If you are given a segment of machine code in hexadecimal, then it can be dissembled into a MIPS machine code.