Winter ’13 CIS 314 Midterm Review

You may bring one page of notes, front and back, and the green sheet from your textbook.

You may bring a calculator but shouldn’t need one.

Questions will be in short-answer format with partial credit for partial answers.

Questions will require you to read and write assembly code.

Topics:

- Arithmetic instructions – immediate, unsigned variations
- Load instructions – load/store word, halfword, byte, unsigned
- Address manipulation – base registers and offsets
- Branches and jumps – PC relative vs. absolute
- Procedures – jal, jr, $ra, the stack, register conventions
- Instruction representation – formats, fields
- Logical operations – and, or, sll, srl, sra, immediate variations
- Assembly – pseudoinstructions, symbol and relocation tables
- Disassembly – MIPS to C/Java
- Number representation – unsigned, 1s compliment, 2s compliment
- Integer arithmetic – add, subtract, multiplication, division, overflow

Sample questions:

1. [10] Describe the general behavior of the following MIPS assembly code (syscall code 1 is write int, syscall code 5 is read int):

   ```
   li $v0, 5
   syscall
   mul $a0 $v0 $v0
   mul $a0 $a0 $v0
   li $v0, 1
   syscall
   ```

2. [10] How would you write hex number 0x0314 in 16-bit unsigned binary?

3. [10] How would you write the decimal number -314 in 16-bit signed binary?