Test 2 will be Thursday, April 3 in class. It will be closed book and notes, except for one 8.5” x 11” sheet of paper (front and back) with notes and the green MARIE Assembly Language handout. (NOTE: NO MIPS material on this test!!)

**Chapter 4.**

Functionality of Computer Components: CPU, Bus, Memory, Clocks, I/O subsystems, Interrupts

CPU Basics: Fetch-Decode-Execute machine cycle, datapath including ALU and registers, control unit

Clocks: frequency, relationship to program performance

MARIE: Architecture, Instr. Set Architecture, machine language format, RTN/RTL for instructions, Fetch-Decode-Execute cycle, I/O

Assembly Process: two-passes, symbol table, assembler directives

MARIE Hardwired Control Unit

MARIE Microprogrammed Control Unit

Tradeoffs between Hardwired vs. Microprogrammed Control Units

You should be able to:

- write a sequence of RTN/RTL for any MARIE instruction or any new MARIE instruction that we might want to add
- translate a segment of high-level language code to MARIE assembly language. (like HW #4)
- partially implement the hardwired control unit for MARIE (like HW #5), and
- write some microcode for the microprogrammed control unit. (like HW #5)