CIT 593 – Midterm Study Guide

Thursday Oct 19th in class 4:30 -6pm
Exam is closed book, closed notes.
Questions may entail similar pattern to quiz. However, since we have more time, some questions will be longer and involve code writing.

Chapter 1

1. Idea of Abstraction
2. Hardware vs. Software
3. Levels of Abstractions (Problem statement to Devices)

Chapter 2

1. Binary Representation (base 2)
2. Unsigned Integers
3. Signed Integers: 2's complement
4. Binary to Decimal Conversion & vice-versa
5. Addition and Subtraction, Overflow
6. Sign-Extension vs. Zero-Extension,
7. Logical Operations: AND, OR, NOT
8. IEEE floating point to decimal and vice versa
9. ASCII rep (no need to memorize each character value table is provided)
10. Hex, Octal representation

Chapter 3 Study only the slides from the website

Chapter 4

1. Components of the Von Nuemann Model
2. Components of ISA and Instruction
3. Instruction Processing cycling - what each stage in the cycle does?
4. How do control instructions change the instruction execution?

Chapter 5

1. LC3 ISA: Memory and Register Organization
2. Different types of LC3 instructions: Arithmetic (include logical), Data Movement i.e. different addressing modes for LD/Store, and Control
3. Know limitations of each LC3 instruction, e.g. Register ADD vs. Immediate Add
4. You are not required to memorize the opcodes or the format: you will be given a handout if the questions refer to particular instructions.

Chapter 7

1. Components of Assembly Language program (e.g. opcodes, labels, operands)
2. Assembler Directives and what they do (e.g. .ORIG)
3. Assembly Process: 1) Generating Symbol table 2) Translate to machine code
4. Able to understand some small code or be able to write some code

Chapter 8

I/O Basics

Concept: 1) Memory Mapped vs. Special I/O instructions 2) Synchronous vs Asynchronous 3) Polling vs Interrupt

How does polling work? (Leads to TRAP instruction chapter 9)

How does interrupt work? (leads to chapter 10)

Chapter 9

TRAP Mechanism

Know the different trap routines from Appendix A.2 (also used in hw3)

Subroutines: How the call/return mechanism works

Difference between JSR and JSRR

Calling conventions (Caller vs. Callee), Argument and Return passing

Library Routine: .External pseudo directive

From slides: Privilege Mode, PSR, MSR.

Chapter 10 (only till section 10.2)

Concept of a stack

How Interrupt I/O actually implemented?

UNIX

1. What is shell?
2. Commands for accessing or creating files and directory e.g. ls, mkdir, cp ,mv, rm
3. File permissions: chmod
4. tar command