

## **Discussion Note #4: Midterm Review Outline**

*UC Berkeley - Department of EECS*  
CS152 - Computer Architecture  
Section 102: Friday 10-12  
T.A.s: Young H. Cho and Nikunj Oza

### **MIDTERM REVIEW OUTLINE**

- I. Performance (10 min)
- II. Cost (10min)
- III. ISA (10min)
- IV. Technology (15min)
- V. ALU (5min)
- VI. Arithmetic (5min)
- VII. Single Cycle Datapath (20min)
- VIII. Single Cycle Control & HDL
- IX. Multiply, Shift, and FP Number (10min)

### **Common Sense: 5 Basic Components**

- A. Datapath
- B. Control
- C. Memory
- D. Input
- E. Output

## I. Performance

**Comments: Important to Keep this mind when evaluating**

- A. Speedup - Amdahl's Law (Concept in Quiz #1)
- B. Compiler Problem - MIPS and CPI
- C. Equations (In the lecture notes and discussion notes)
- D. Frequently missed problems in Quiz
  - Problem 2.5 (More infos in solution sets)
  - Problem 2.9

## II. Cost

**Comments: Important for profit reasons**

- A. Equations - Die Equations (Compiled in Notes)
- B. Look into questions regarding this:
  - Problem 2.11

## III. ISA

**Comments: Important to be familiar with MIPS because you will be implementing it in your design**

- A. Questions to look at in DQ#1
  - Problem 3.3
  - Problem 3.5
- B. There are problem in sections 3.9 and 3.10
- C. Look back Homework #2

## IV. Technology

**Comments: Real issue in hardware implementations**

- A. CMOS technology
  - Mostly from the notes
  - Discussion notes #3
- B. Internal Delay - LDD
- C. Cycle time
- D. Related problems in DQ#1
  - Problem 4.3

## **Administrative**

- A. Setup all the groups**
- B. Verify all the group members**
- C. Make sure two leaders send me email**
- D. Accounts will be only given to those responded**
- E. Work early**
- F. MT1 results were very good!**
- G.**

## **V. ALU**

**Comments: Need to know for the assignment**

- A. Related problem in DQ#1
  - Problem 4.4
- B. Carry-Look-Ahead
- C. Carry Select

## **VI. Arithmetic**

- A. Multiply
  - How would you implement this?
  - Final designs from the book
  - Booths (Read Book)

## **VII. Single Cycle Datapath**

**Comments: Very important to know. Because you will be implementing this in next lab assignment.**

- A. Datapath - Class is all about
- B. Draw your idea of what Computer is
- C. Block diagram

## **VIII. Single Cycle Control & HDL**

## **IX. Multiply, Shift, and FP Number**

**Comments: Important to know the concept**

- A. IEEE 31 / 30-23 / 22-0
  - $(-1)^s * (1+\text{significand}) \times 2^{(\text{exponent}-\text{bias})}$
- B. Floating point Add and Multiply