
CS152
Computer Architecture and Engineering
Discussion #3

February 10, 1995

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Timing Delays

- ◆ Important items:
 - Setup time
 - Hold time
 - Clock to Q
- ◆ Let's see an example...

Overflow

- ◆ Overflow occurs when:
 - The sum of two positive numbers is negative.
 - The sum of two negative numbers is positive.
- ◆ or...
 - The carry into the most significant bit is not equal to the carry out of the most significant bit.

Example of Overflow

$$\begin{array}{r} 0111 \\ 0111 \quad 7 \\ + 0011 \quad 3 \\ \hline 1010 \quad -6 \end{array}$$

Carry Select Adder

- ◆ Faster than a ripple carry adder.
- ◆ Here's a drawing:
- ◆ but...

Carry Lookahead is much cooler!

- ◆ The basic formula is
$$\text{CarryOut} = (A \& B) \mid (A \& \text{CarryIn}) \mid (B \& \text{CarryIn})$$
- ◆ From here, you can have as much carry lookahead as you want; however,...
- ◆ A “full” carry lookahead adder is too expensive. People typically connect several partial lookahead adders.

Administrative Matters

- ◆ My homepage (<http://http.cs.berkeley.edu/~oza>) has my discussion notes.
- ◆ Exam #1
 - Wednesday, February 22, 5PM-8PM, Sibley Auditorium
 - 2 hand-drawn sheets of paper are allowed.
 - Pizza at LaVal's Northside after the exam.

Suggestion about multipliers

- ◆ Go through the three algorithms in the order that Dave presented them.
- ◆ Convince yourself that each one works.
- ◆ On to homework #1