

Lab3 Post Lab Questions

1. (2 pts ea) For the equation below:

$$C_{new} = C_a * F + C_b * (1 - F)$$

Let $C_a = 0.75$, $C_b = 0.625$. $F = 0.325$. Give the 8 bit binary values for:

- a. $C_a =$ _____
- b. $C_b =$ _____
- c. $F =$ _____
- d. $1 - F =$ _____ (as calculated in this lab)
- e. $C_a * F =$ _____ (upper 8 bits only)
- f. $C_b * (1 - F) =$ _____ (upper 8 bits only)
- g. $C_{new} =$ _____ (8 bits)
- h. C_{new} _____ (decimal value)

2. (4 pts each) Remember that our calculation of C_{new} is only an approximation. What is the correct value of C_{new} without any approximations?

What is the percent error between the correct value of C_{new} and the approximate value of C_{new} computed by the hardware?

(compute as $(C_{new_correct} - C_{new_approximate}) / C_{new_correct} * 100\%$)

How large is the absolute error in terms of Least Significant Bits? (1 LSB = $1/256$). Compute as $(C_{new_correct} - C_{new_approximate}) / (1/256)$.

3. (5 pts) What is the functionality of the Carry Chain in the Altera Flex 10K FPGA? What is the advantage of using carry chain logic over just using normal LUTs?