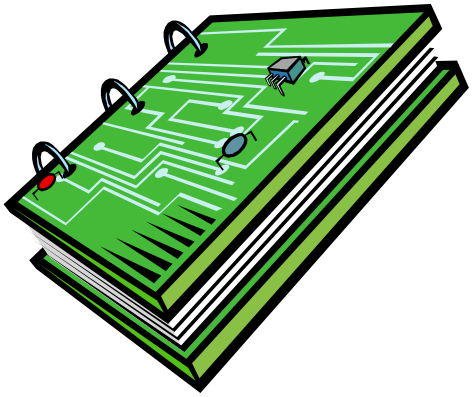
California State University, Sacramento
College of Engineering and Computer Science

Computer Science 28: Discrete Mathematics

Spring 2017 – Assignment #4 – 2-Bit Multiplier

About

For this assignment, you are going to create the algebraic equations to implement a 2-bit multiplier. The multiplier will take two 2-bit integers as input and output a 4-bit number representing the product of the two numbers.



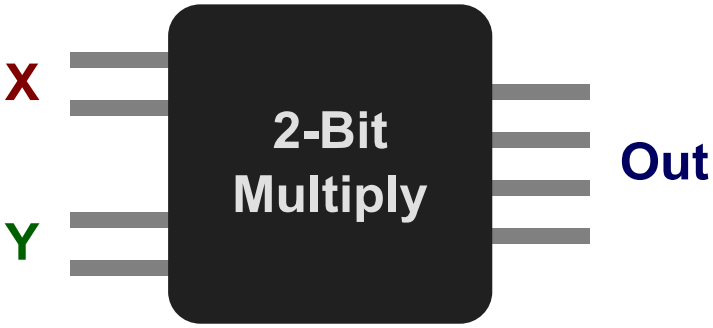
Due Date

Homework should be ready to turn-in at the beginning of Thursday's lecture.

If you cannot turn-in your work in class, then you may submit your homework at Riverside Hall 3018 instead, but you must time-stamp and write “Cook CSc 28” across the top of your submission.

Problem

To implement your circuit, you need a total of four input values which represents to the two bits in the first and second operand. The output will be 4-bits. For example: 11 + 10 = 0110.



To create the circuit, you need to compute the Boolean equations for each of the four output wires given the four input wires. There are different ways to do this:

1. Boolean algebra
2. Karnaugh Map (which is Boolean Algebra)

You will need to create a very large truth table and work from there. The names of the literals are up to you.