California State University, Sacramento
College of Engineering and Computer Science

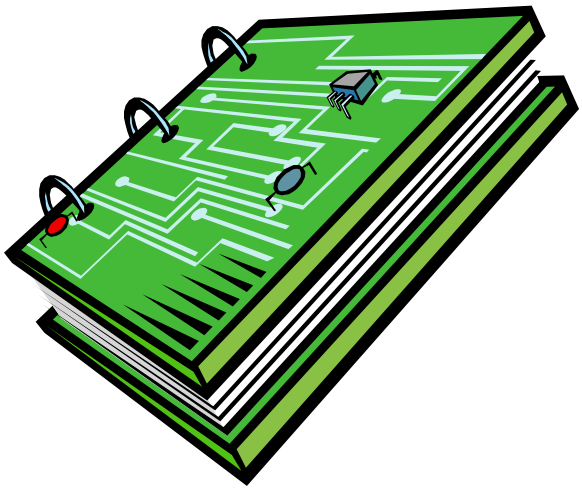
Computer Science 28: Discrete Mathematics

Spring 2018 – Assignment #4 – Circuits

Due Date

Homework is due the beginning of class in one week.

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.



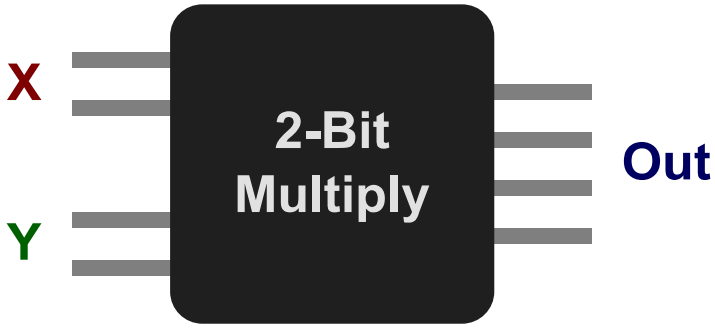
Circuits

Draw a circuit for the following Boolean expressions *(5 points each)*:

1. `out = a + c b`
2. `out = a b (c + d)`
3. `out = a + c b (e + f)`
4. `out = b → c + ad`

Karnaugh Maps

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. The names of the literals are up to you. I recommend: a, b, c, d. You need to do the following steps

1. Create a table to represent all the possible inputs (and the generated outputs) *(20 points)*
2. Use a Karnaugh Map to create simplified equations. *(20 points)*