

COS126 Boolean Algebra Exercise

The well-known Fibonacci numbers are 1, 1, 2, 3, 5, 8, 13, ...

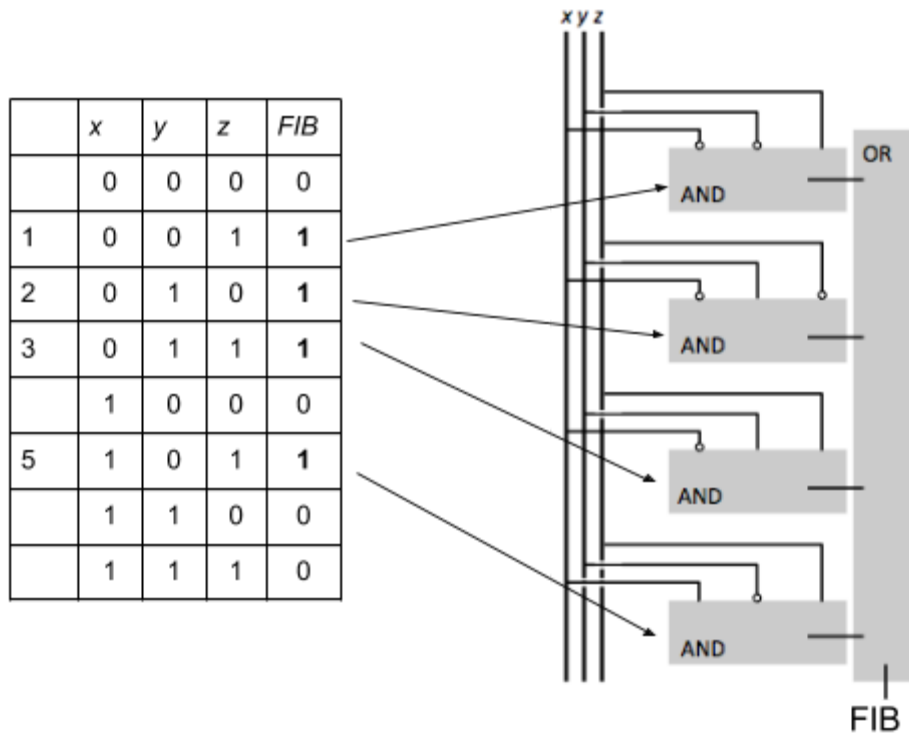
Let the Boolean variables x , y , and z together represent a 3-bit non-negative binary number (that is, not in 2's-complement representation). Let z be the least significant bit (that is, write the number as xyz). Let F be a Boolean variable that indicates whether the number represented by x , y and z is a Fibonacci number. ($F = 1$ if it is and 0 otherwise.)

1. Write out the Truth Table for the function F .

2. Write out the sum-of-products formula for F (with no simplifications).

3. Challenge: Simplify the formula.

4. Here is a combinational circuit of the sum-of-products expression for F using gate notation.



5. Here is a combinational circuit of the sum-of-products expression for F using switch notation.

