## COS126 Boolean Algebra Exercise

The well-known Fibonacci numbers are $1,1,2,3,5,8,13, \ldots$
Let the Boolean variables $\mathrm{x}, \mathrm{y}$, 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 $\mathrm{x}, \mathrm{y}$ and z is a Fibonacci number. ( $\mathrm{F}=1$ 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 switch notation

