Computer Science 281
Lab 7: Finite State Machines

The goal of this lab is to design a sequential circuit that can detect two or more consecutive 1's in a stream of input bits. Specifically, if the last two bits in the sequence were 1, the circuit should output 1. Otherwise, it should output 0.

1. Design a finite state machine that describes the operation of this circuit.
2. Draw a truth table that describes the next state function of the finite state machine.
3. Use K-maps to simplify the boolean expression for the next state function. Use "don't cares" in your K-maps to improve your results.
4. Draw a truth table and resulting boolean expression for the output function.
5. Design a sequential circuit from your boolean expressions. Use 2 D flip-flops.
6. Implement your circuit on a bread board. The D flip-flop IC number is 7474. Demonstrate your completed circuit for your instructor.