

ECE238

Lab Homework #2 (10 % Lab Grade) th

Due date: July 9 11:00 – 13:45 at Room 216

Please do not send your homework via email; turn in a printed version of your work.

Problem 1.

Write 2 VHDL descriptions, sm1.vhd (Figure 1) and sm2.vhd (Figure 2), for the Moore state machines showed below. Both state machines accept as inputs X , $reset$ and clk , and have as output a bit $output$. State machine 1 recognizes the string “0110” meanwhile state machine 2 recognizes a rising edges in the input. Test the state machine 1 with the input sequence $X = “01001100110”$ (if every thing is correct then there will be two 1s at the output), and the state machine 2 with the input sequence $X = “0001000100110”$ (3 raising edges). Turn in sm1.vhd, sm2.vhd and the two waveforms for the above mentioned test cases.

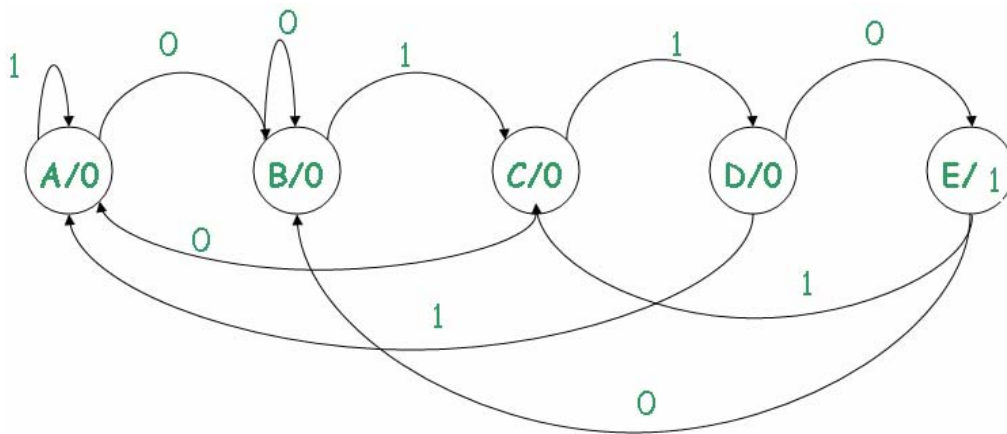


Figure 1. State machine 1.

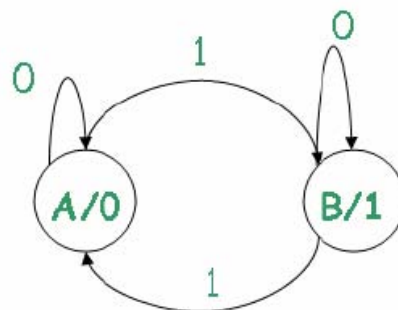


Figure 2. State machine 2.

Problem 2.

Write a VHDL description, `sys.vhd`, for the system showed in Figure 3. The system accepts the inputs `X`, `clk` and `reset`, and has as output a bit *output*. Test your system with the input `X = "01001100110100000110"`. Turn in `sys.vhd` and the waveform for the above mentioned test case.

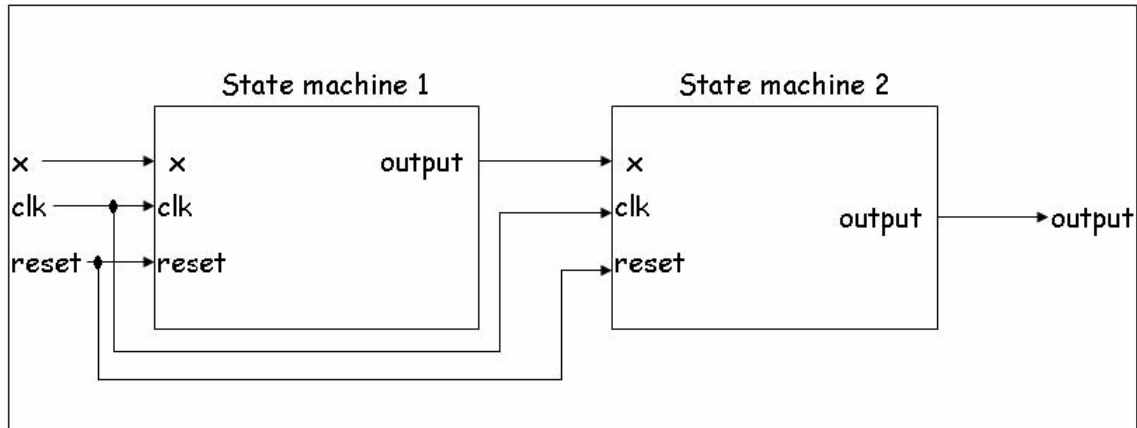


Figure 3.

Hint: Review, video 3: Introduction to VHDL (~50 MB) at:

<http://www.digilentinc.com/Education/Tutorials.cfm?Nav1=Education&Nav2=Tutorials>