Class Activity 4

1. Reverse engineer the behavior of the sequential circuit shown in Figure 1. Draw the state diagram and write the VHDL model for it.

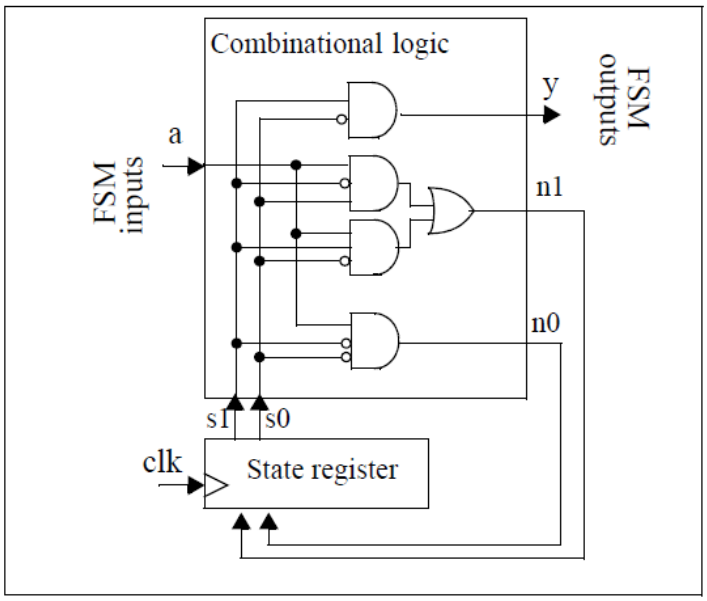

Figure 1

2. Design a soda machine controller that can dispense two kinds of soda. If S1Sel is selected, soda1 is dispensed, if S2Sel is selected then soda2 is dispensed. Each soda costs 75 cents and your machine accepts quarters only. The coin sensor has three outputs to detect first coin, second coin and the third coin. Once the soda is dispensed, the controller must be reset to be able to detect the coins again. The black-box view of the system is given here. The FPGA board push button are used to simulate the reset button and the coin sensor. DIP switches are used to simulate S1Sel and S2Sel. **Since these push buttons have a pull-up resistor, they read 1 when they are not pressed. When you press them they will read in a zero.** A coin in is simulated by pressing the push button, therefore when the coin is inserted, cin = 0. Use LEDS to simulate S1out and S2out. Download the VHDL code into board and examine its functionality to practice.