CS 2420 Lab 10

Topics: Sequential Logic Design

This lab needs to be done with minimal help. You are the designer. You need to use what you have learned throughout the semester and complete the task.

Pre Lab: As much as you can get done.

Design

Design a sequential logic circuit for an automatic ticket vending machine. The machine can only accept a 0.5 dollar coin or a 1 dollar coin. When the machine receives 2 dollars, it sends out a stamp. If the machine already received 1.5 dollar, and the 1 dollar is given, then it sends out a stamp as well as a change of 0.5 dollars.

Steps and Requirements

1. Definition: A=1, the signal for the machine that receives a 1 dollar coin
   A=0, no coin received
   B=1, the signal for the machine that receives a 0.5 dollar coin
   B=0, no coin received
   X=1, the signal for the machine that sends out a stamp
   X=0, no stamp is sent
   Y=1, the signal for the machine that sends change of a 0.5 dollar coin
   Y=0, no change is given

2. Based on labs 8 and 9, determine which FSM (Mealy or Moore) is used and complete the state diagram.

3. Using positive edge triggered D flipflops to implement the design. Set up a transition table, identify each state with an encoding and use excitation tables and K-maps to compute the input and output circuits of the flipflops.

4. Now build the device you have designed in DSCH, test it, debug it, and have your instructor verify the design, take screen shots for your report.

5. Defend your reasoning for choosing the machine you did.