

Project 3 Sequence Recognizer  
CSc 137, Fall 2016, Faroughi

Due in Class Nov. 23rd

- 1) Consider problem 5.10. We would like to design and model Mealy the FSM by determining the minimal expressions for the NSG and OG outputs. Do the following:
  - a. Draw the Moore FSD
  - b. Create a detailed block diagram for the FSM that
    - i. Shows the number of flip-flops and combinational circuit modules
    - ii. Identifies input and outputs of the combinational modules
  - c. Create a transition (truth) table for the OG
  - d. Create a transition table for the NSG
  - e. Determine the logic expressions for the output and the next state variables
  - f. Create a behavioral model for the OG using “assign” statement
  - g. Create a behavioral model for the NSG using “assign” statements
  - h. Create a behavioral model for the FFs using “if-else” statement
  - i. Combine the models to create the model for the FSM.
  - j. Create a test bench with the test vector 1001001100100 entered 1-bit at the time from right to left. Follow the examples presented in class (also in the textbook) for how to generate a clock signal, reset the recognizer, and how to enter the test vector one bit at a time.
- 2) Consider problem 5.11. This time we want to model the FSM directly from its FSD. No truth tables and determining the minimum expressions are needed. Do the following:
  - a. Follow the example discussed in class (also available in the book) to model the FSM. The model shall have three sections: a model for the NSG, a model for the OG, and a model for the FFs.
  - b. Apply the test vectors in part j above.
- 3) Submit the followings:
  - a. The design data for Part 1: The Moore FSD, the detailed block diagram, the truth tables, the minimization steps, and the final circuit
  - b. The design data for Part 2: The Mealy FSD
  - c. Print out of the Verilog models for Parts 1 and 2.
  - d. The print out of the outputs with the analyses that illustrates the correction operation of the circuits.

**Points: 35 total**

10 points for part 3.a

5 points for part 3.b

10 points for part 3.c

10 points for part 3.d

