Lab-6 (25th and 27th September)

ECE270 - Embedded Logic Design

Board: Basys 3 Board, Xilinx Artix – 7 FPGA (XC7A35T-1CPG236C)

Tasks:

1. Design and code an FSM to detect an overlapping sequence of '11011' as
   a) Moore machine.
   b) Mealy machine.
   Compare the resource requirement for both machines.

2. Design and code an FSM to detect a non-overlapping sequence of '10101' as
   a) Moore machine.
   b) Mealy machine.
   Compare the resource requirement for both designs.

Design details:

- The input sequence will be given with the help of two push buttons.
- One of the push button will correspond to an input of '1' and other to an input of '0'.
- Use debouncing circuit to generate a clean pulse if any of the push button is pressed.
- Use this pulse to sample the inputs of the sequence detector FSM module.
- Whenever the desired sequence is detected, one of the LEDs on board should light up.
- The output LED should remain low whenever the input sequence is invalid.

Specific submission requirements:

- In the document to be submitted on Backpack, attach the FSM for both Mealy and Moore machines in the document along with your codes.