LAB 8. Sequence Recognizer

A1) Design a sequence recognizer (Mealy machine) for a sequence of '10011'. Look at the following example.

      Input X: 0101 0011 1110 1010 1001 1001 1010 0100 1100

      Output Z: 0000 0001 0000 0000 0000 1000 1000 0000 0100

- Draw a state diagram. (20 pts)→ Submitthe picture of it on Canvas.
- Draw a state table.
- Find input equations and output equations.
- Design a circuit by using D flip-flops. (20 pts)→ Submitthe block design (pdf format) on Canvas.
- On Vivado,run simulation with the input X as given above and submit the picture on Canvas. (60 pts)
- Clock: 0.5 Hz

NOT : It is important to align the input X to the clock. Let's say the clock transition happens at 0, T, 2T, ..., and the inputs are divided in time as [t, T+t], [T+t, 2T+t], [2T+t, 3T+t]... If 't' is too long, the output Z can become '1' prematurely. If 't' is too short, the flip-flop may not be able to catch the correct input. Please find the optimum 't' by trial and error.