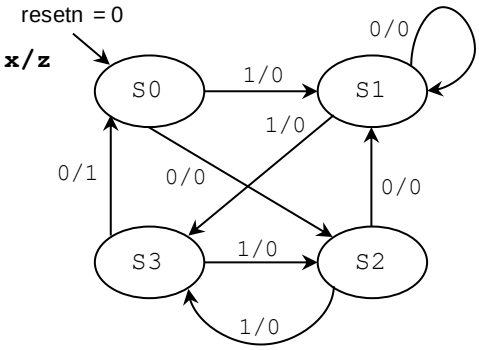
Solutions - Quiz 4

(Nov. 21st @ 5:30 pm)

PROBLEM 1 (30 PTS)

- Given the following State Machine Diagram.
  - ✓ Is this a Mealy or a Moore machine? Why?
  - ✓ Provide the State Table and the Excitation Table.
    - Use S0 (Q=00), S1 (Q=01), S2 (Q=10), S3 (Q=11) to encode the states.



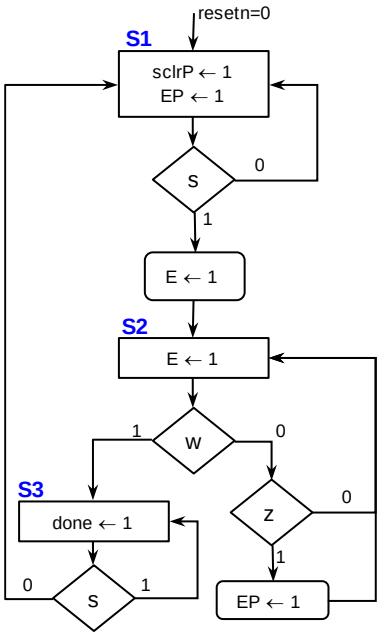
x	PRESENT STATE	NEXT STATE	z
0	S0	S2	0
0	S1	S1	0
0	S2	S1	0
0	S3	S0	1
1	S0	S1	0
1	S1	S3	0
1	S2	S3	0
1	S3	S2	0

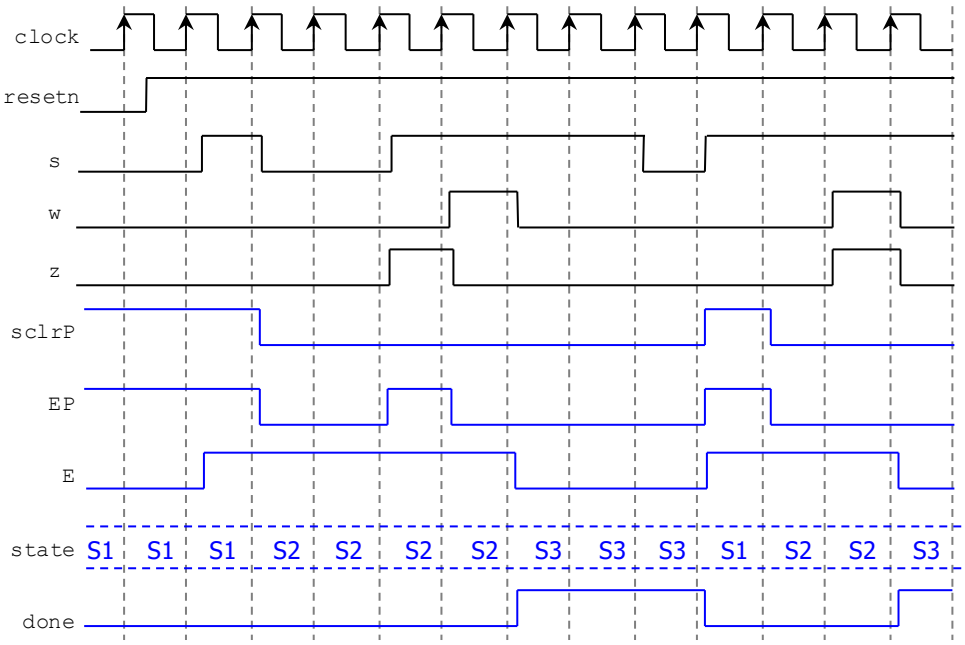
PRESENT STATE			NEXTSTATE		
x	Q_1	Q_0 (t)	Q_1	Q_0 (t+1)	z
0	0	0	1	0	0
0	0	1	0	1	0
0	1	0	0	1	0
0	1	1	0	0	1
1	0	0	0	1	0
1	0	1	1	1	0
1	1	0	1	1	0
1	1	1	1	0	0

It is a Mealy FSM as the output depends on the input as well as the present state.

PROBLEM 2 (40 PTS)

- Complete the timing diagram of the following FSM (represented in ASM form):





PROBLEM 3 (30 PTS)

- Sequence detector: Draw the state diagram (any representation) of an FSM with input x and output z. The detector asserts $z = 1$ when the sequence 1110 is detected. Right after the sequence is detected, the circuit looks for a new sequence.