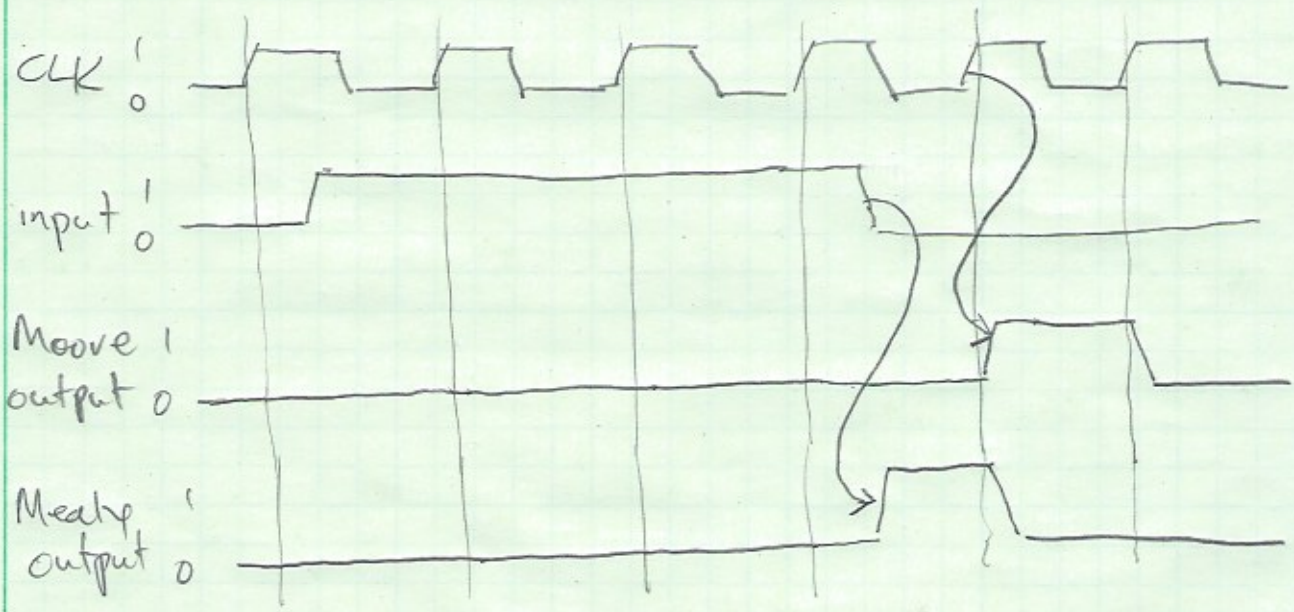
ENEL 353 Section 02 Lecture

Fri Nov 8 2019

Midterms

- returned at end of lecture today
- solutions have been posted
- average and median scores are both about 78.5%

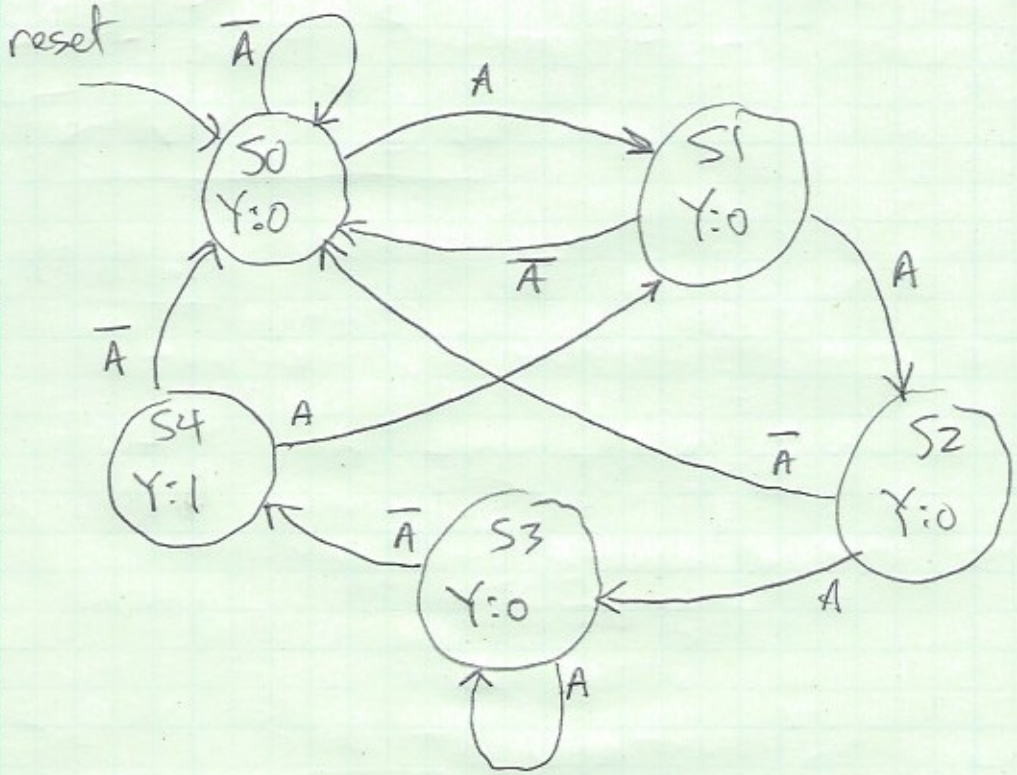
Set 8, Slide 43 (continued)



Slide 44 – Moore FSM

S0 – from reset, or looking for 1st of 3 1's
S1 – looking for the 2nd of 3 1's
S2 – looking for the 3rd of 3 1's
S3 – got 3 or more 1's in a row
S4 – last 4 input samples were 1 1 1 0

oldest ↑ ↖ newest



Remark

Transitions could be labelled with 0 or 1 instead of $\overline{A}$ or A.

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Slide 45 – Mealy FSM

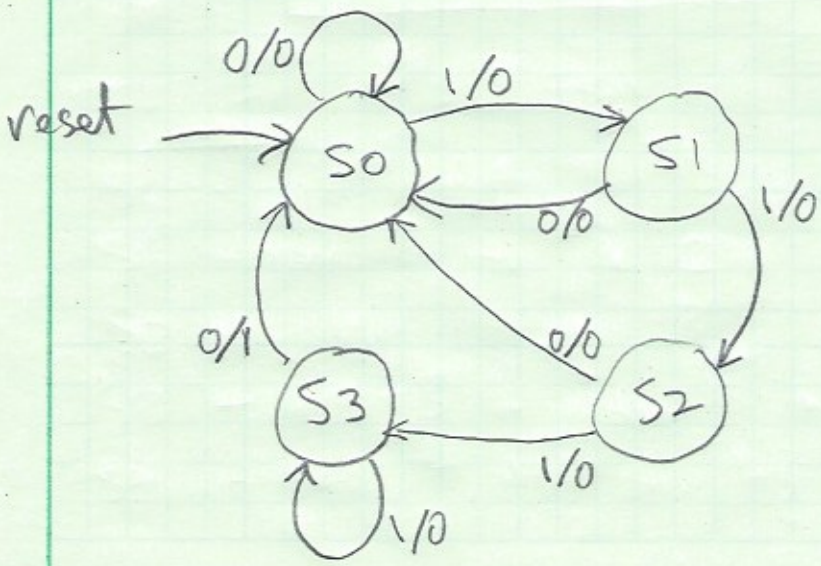
States

S0: from reset, looking for first 1

S1: looking for 2nd 1

S2: looking for 3rd 1

S3: got 3 or more 1's – make Y=1 if A=0, Y=0 if A=1



arc labelling

input / output

General remarks: In Moore FSM diagrams, output should be indicated within states. That can't be done in Mealy FSM diagrams, because output depends on current input as well as current state — on Mealy diagrams, it's convenient to indicate output on transition arcs.

Slide 46

Unsigned binary encoding

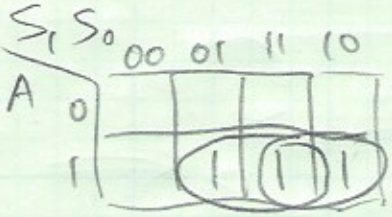
state	S_1	S_0
S0	0	0
S1	0	1
S2	1	0
S3	1	1

Combined state and output table

current state S_1	current state S_0	input A	next state S_1'	next state S_0'	output Y
0	0	0	0	0	0
0	0	1	0	1	0
0	1	0	0	0	0
0	1	1	1	0	0
1	0	0	0	0	0
1	0	1	1	1	0
1	1	0	0	0	1
1	1	1	1	1	0

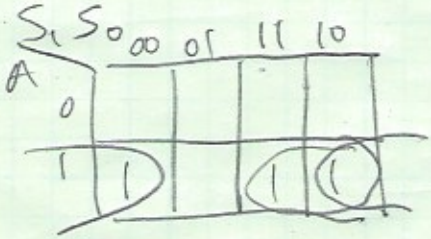
Equations

S_1'



$S_1' = S_0 A + S_1 A$

S_0'

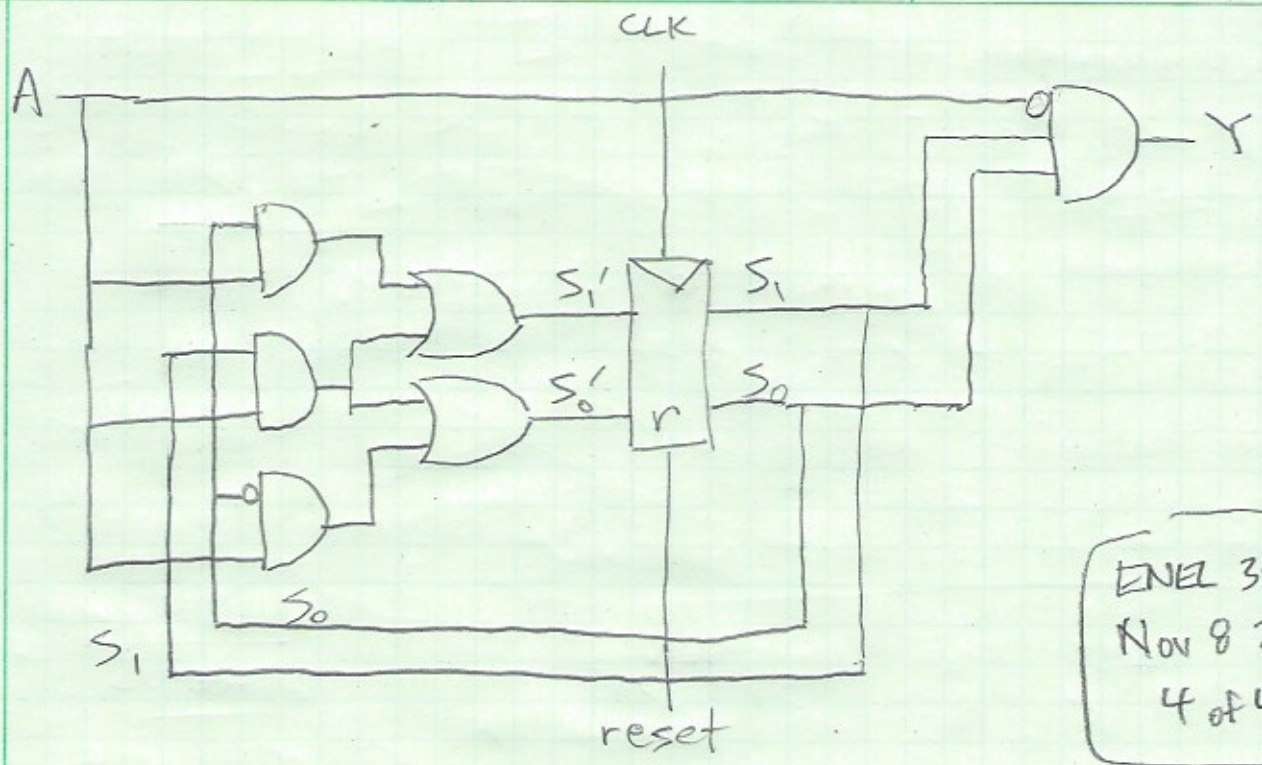


$S_0' = \overline{S}_0 A + S_1 A$

↑ shared product ↑

Output (by inspection)

$Y = S_1 S_0 \overline{A}$



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