

Kevin Cendana

CSc 137

HW #4

(12 pts)

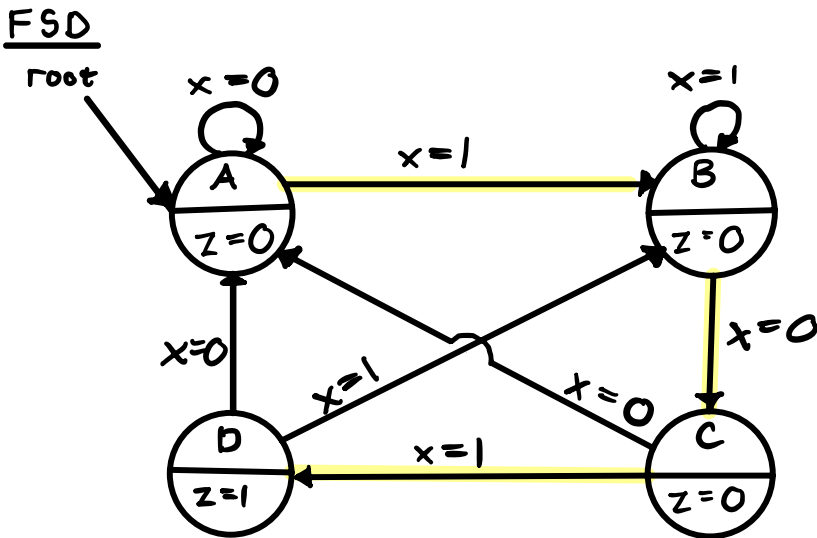
5.8. Design a Moore sequence recognizer that detects the nonoverlapping sequence “101.” Use binary encoded state labels and design and draw the circuit schematic similar to the one shown in Fig. 5.16. (4 pts)

5.9. Design a Mealy sequence recognizer that detects the nonoverlapping sequence “101.” Use binary encoded state labels and draw the circuit schematic similar to the one shown in Fig. 5.16. (4 pts)

5.10. Design a Moore sequence recognizer that detects the overlapping sequence “1001.” Use binary encoded state labels. . (Step 1. FSD only) (4 pts)

5.8. Design a Moore sequence recognizer that detects the nonoverlapping sequence "101." Use binary encoded state labels and design and draw the circuit schematic similar to the one shown in Fig. 5.16. (4 pts)

Moore: depends on current state only



min bits

$$\log_2(\# \text{ of states}) = \# \text{ of bits}$$

$$\log_2(4) = 2$$

output generator (OG)

	current state		output z
	d_1	d_0	
A	0	0	0
B	0	1	0
C	1	0	0
D	1	1	1

Create NSG from FSD

A = 00 B = 01
C = 10 D = 11

	Current States	Input	Output Next State		
		x	d_1	d_0	
1	A	0	0	0	A
2	A	1	0	1	B
3	B	0	1	0	C
4	B	1	0	1	B
5	C	0	0	0	A
6	C	1	1	1	D
7	D	0	0	0	A
8	D	1	0	1	B

$$d_1 = \bar{X} \bar{A} B + X A \bar{B}$$

$$= Q$$

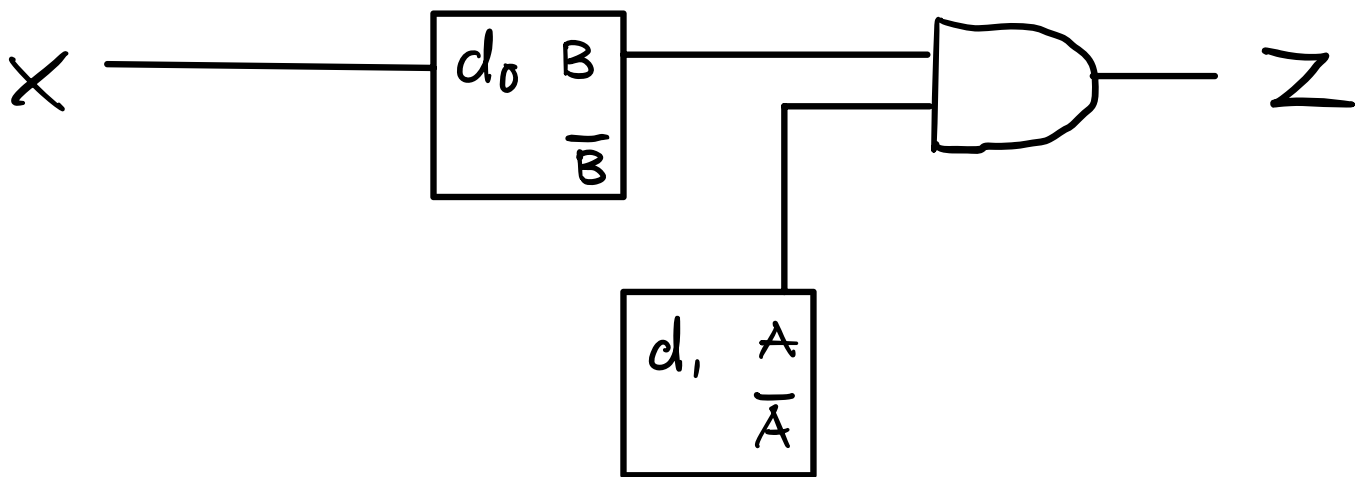
$$d_0 = X = \bar{A} \bar{B} X + A \bar{B} \bar{X} + A \bar{B} X + A B X$$

$$Z = AB$$

$$d_1 = Q$$

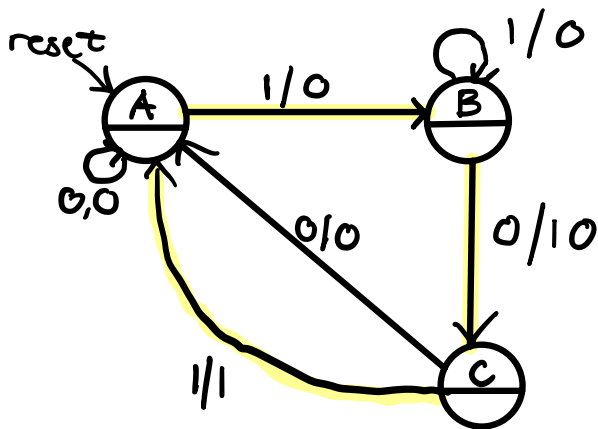
$$d_0 = X$$

$$Z = AB$$



5.9. Design a Mealy sequence recognizer that detects the nonoverlapping sequence "101." Use binary encoded state labels and draw the circuit schematic similar to the one shown in Fig. 5.16. (4 pts)

Mealy: both state & input



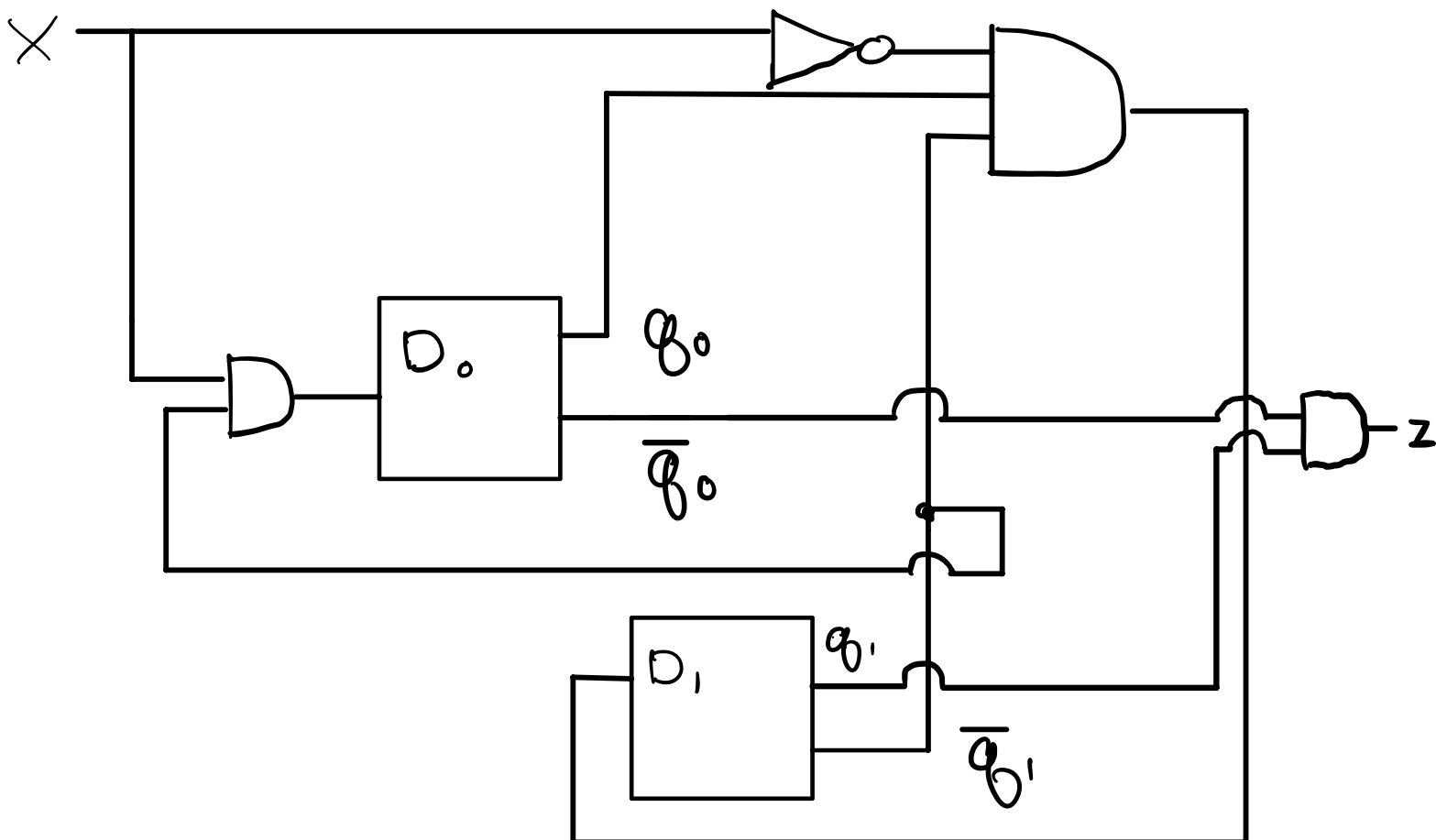
	current state		input	next state		out	
	q_1	q_0	x	d_1	d_0	Z	
A	0	0	0	0	0	0	
	0	0	1	0	1	0	
B	0	1	0	1	0	0	
	0	1	1	0	1	0	
C	1	0	0	0	0	0	
	1	0	1	0	0	1	
	1	1	0				
	1	1	1				

$$d_1 = \bar{q}_1 q_0 \bar{x}$$

$$d_0 = \bar{q}_1 \bar{q}_0 x + \bar{q}_1 q_0 x$$

$$= x \bar{q}_1$$

$$z = q_1 \bar{q}_0$$



5.10. Design a Moore sequence recognizer that detects the overlapping sequence "1001." Use binary encoded state labels. . (Step 1. FSD only) (4 pts)

