Tushaar
Sriramajayam
3/4/2022

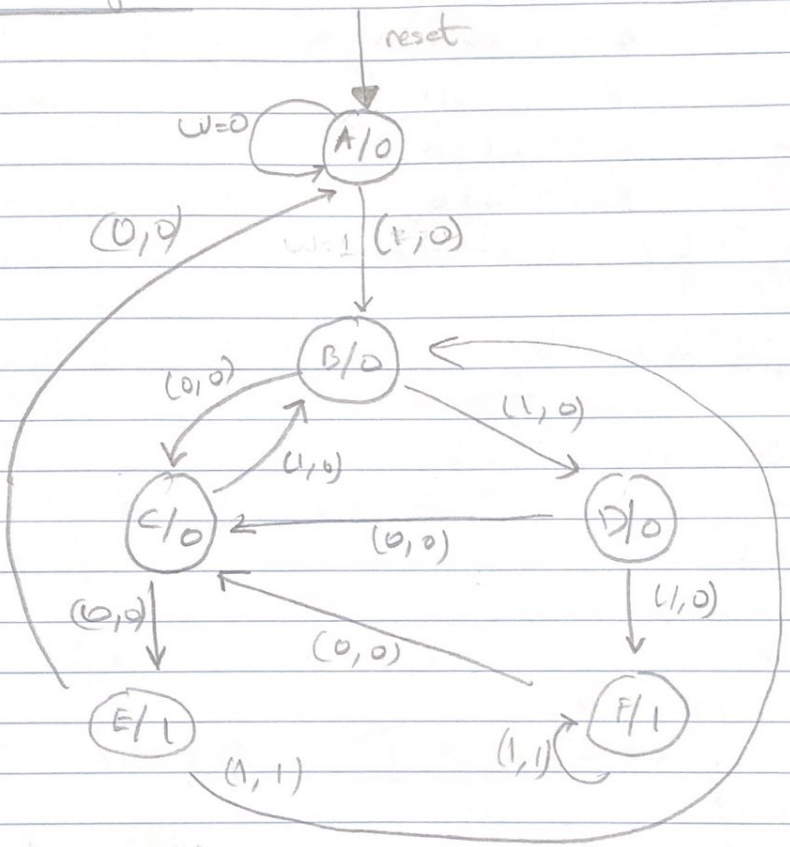
COEN 21 - HW#7

6.3 input: w
output: z

z = 1, w = 1001, 1111, otherwise z = 0

MEALY FSM is required
→ output dependent

State Diagram



6.9 input: w_1, w_2
output z

if $w_1 = w_2$ | $z = 1$ else $z = 0$

	0	1	2	3	4	5	6	7	8	9	10	11	12
w_1 =	0	1	1	0	1	1	1	0	0	0	1	1	0
w_2 =	1	1	1	0	1	0	1	0	0	0	1	1	1
z =	0	0	0	0	1	0	0	0	0	1	1	1	0
					↑					↑	↑	↑	

(mealy FSM)

Let $x = w_1 \oplus w_2$

State Table

	Present State		Input	Next State		Output
	y_1	y_0	x	Y_1	Y_0	z
A:	0	0	0	0	1	0
	0	0	1	0	0	0
B:	0	1	0	1	0	0
	0	1	1	0	0	0
C:	1	0	0	1	1	0
	1	0	1	0	0	0
D:	1	1	0	1	1	1
	1	1	1	0	0	0

KMAP MINIMIZATION

Y_1

y_1 \ $y_0 x$	00	01	11	10
0	0	0	0	1
1	D	0	0	1

$Y_1 = \bar{x} y_0 + \bar{x} y_1$

Y_0

y_1 \ $y_0 x$	00	01	11	10
0	1	0	0	0
1	1	0	0	0

$Y_0 = \bar{x}\bar{y_0} + y_1 \bar{x}$

z

y_1 \ $y_0 x$	00	01	11	10
0	0	0	0	0
1	0	0	0	1

$z = x y_1 y_0$

Circuit Diagram