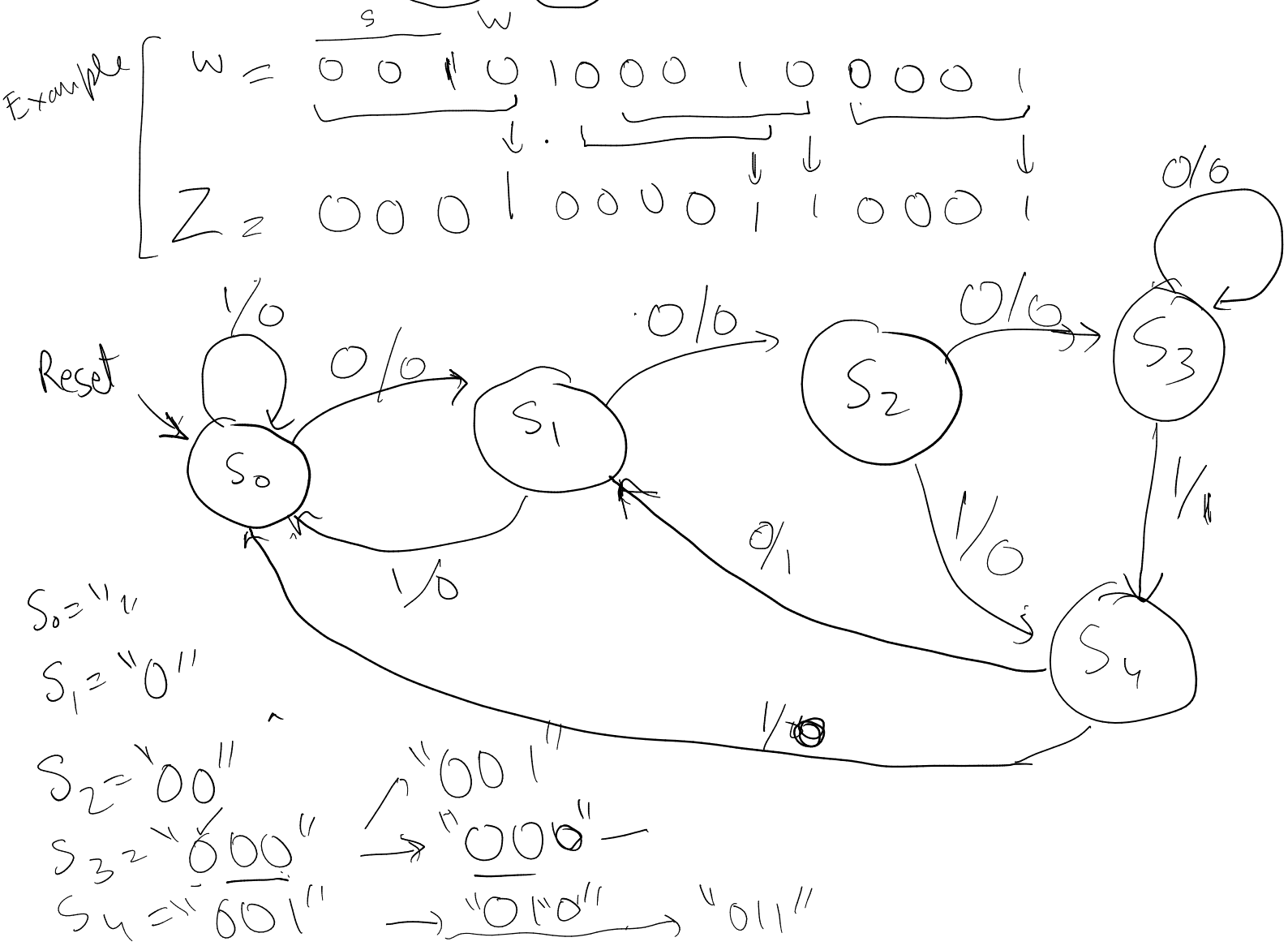
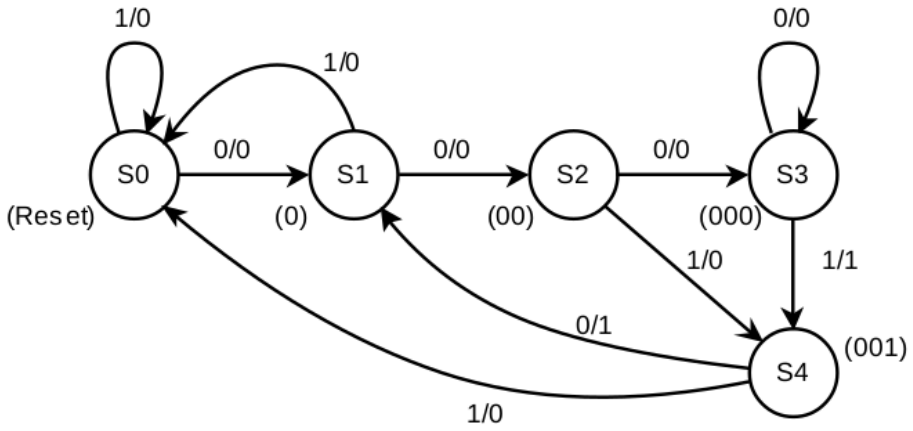
Mealy W State 3

Detect sequences of 0010 or 0001. Overlapping patterns are allowed.



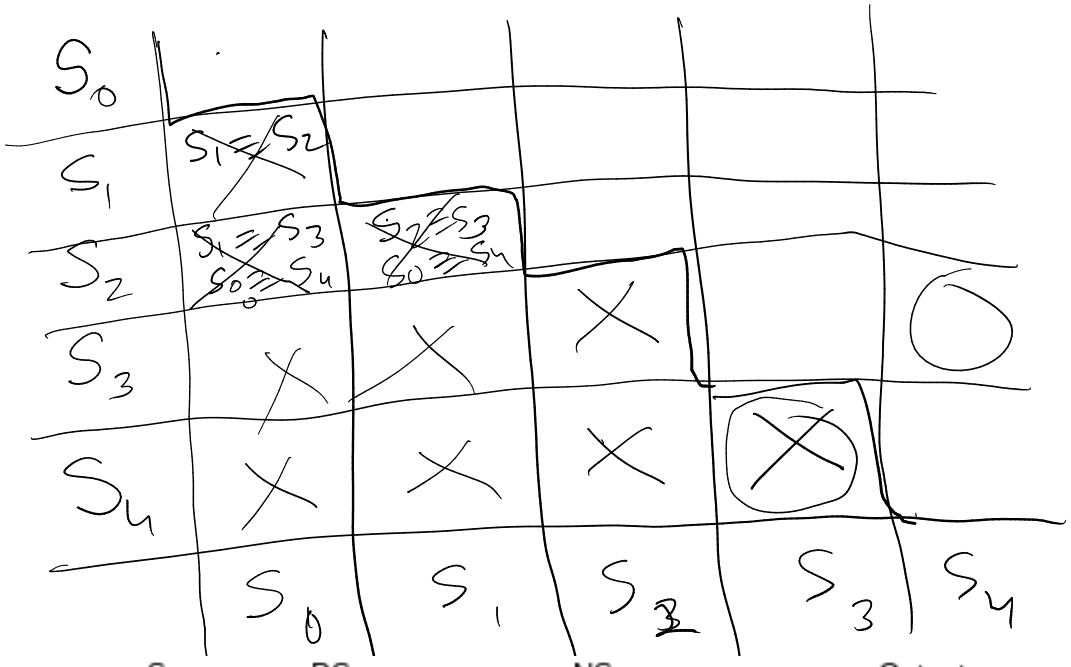
Mealy state diagram



Seq	PS	NS		Output (Z)	
		w=0	w=1	w=0	w=1
"1"	S_0	S_1	S_0	0	0
"0"	S_1	S_2	S_0	0	0
"00"	S_2	S_3	S_4	0	0
"000"	S_3	S_3	S_4	0	1
"001"	S_4	S_1	S_0	1	0

Seq	PS	NS		Output	
		W=0	W=1	W=0	W=1
()	S0	S1	S0	0	0
"0"	S1	S2	S0	0	0
"00"	S2	S3	S4	0	0
"000"	S3	S3	S4	0	1
"001"	S4	S1	S0	1	0

State reduction



Seq	PS	NS		Output	
		W=0	W=1	W=0	W=1
()	S0	S1	S0	0	0
"0"	S1	S2	S0	0	0
"00"	S2	S3	S4	0	0
"000"	S3	S3	S4	0	1
"001"	S4	S1	S0	1	0

State assignment

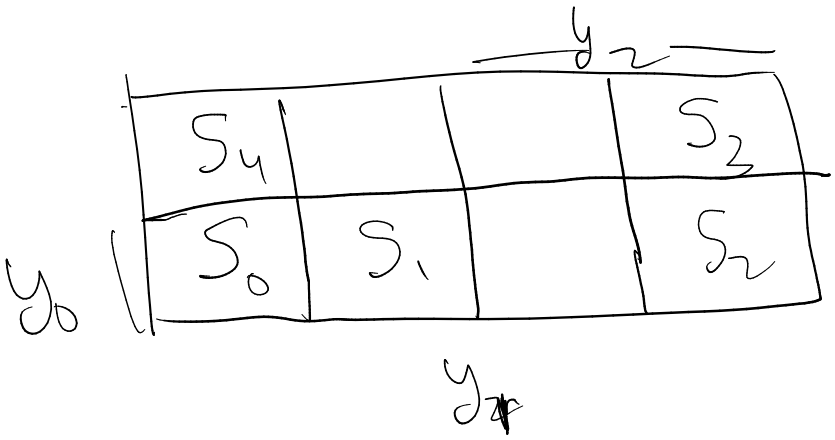
G1: In-neighbors: $(S0, S1, S4), (S0, S4)\ (S2, S3)^{x2}$

common next state

G2: Out-neighbors: $(S1, S0)^{x2}, (S2, S0), (S3, S4)^{x2}$

common prev state

State assignment 4 < # states = 5 ≤ 8 3 ff

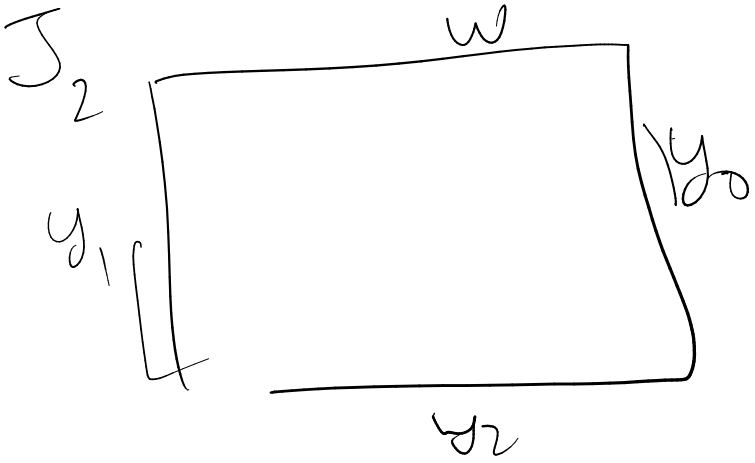


	$y_2\ y_1\ y_0$
S_0	0 0 1
S_1	0 1 1
S_2	1 0 1
S_3	1 0 0
S_4	0 0 0

Seq	PS	NS		Output	
		W=0	W=1	W=0	W=1
0	S0	S1	S0	0	0
"0"	S1	S2	S0	0	0
"00"	S2	S3	S4	0	0
"000"	S3	S3	S4	0	1
"001"	S4	S1	S0	1	0

PS	NS $Y_2^+ Y_1^+ Y_0^+$		JK-Input
	w=0	w=1	w=0
$y_2 y_1 y_0$	$Y_2 Y_1 Y_0$	$Y_2 Y_1 Y_0$	$J_2 K_2\ J_1 K_1\ J_0 K_0$
0 0 1	0 1 1	0 0 1	0 d 1 d d 0
0 1 1	1 0 1	0 0 1	
1 0 1	1 0 0	0 0 0	
1 0 0	1 0 0	0 0 0	
1 0 0 0	0 1 1	0 0 1	

JK-ff



$Q \to Q^+$	J K
0 0	0 d
0 1	1 d
1 0	d 1
1 1	d 0

excitation table
hold 00
reset 01

G1: in-neighbors: (S0, S1, S4), (S0, S4), (S2, S3), (S2, S3)

G2: out-neighbors: (S1, S0), (S2, S0), (S3, S4), (S1, S0)