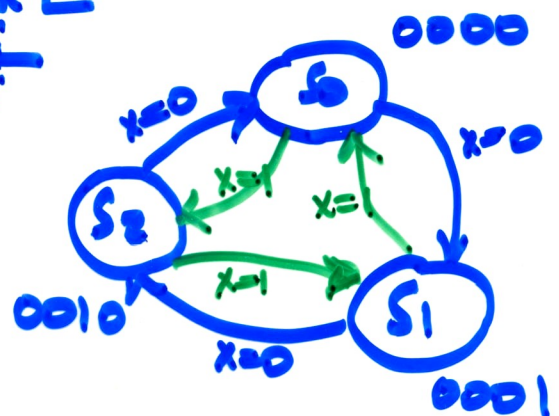
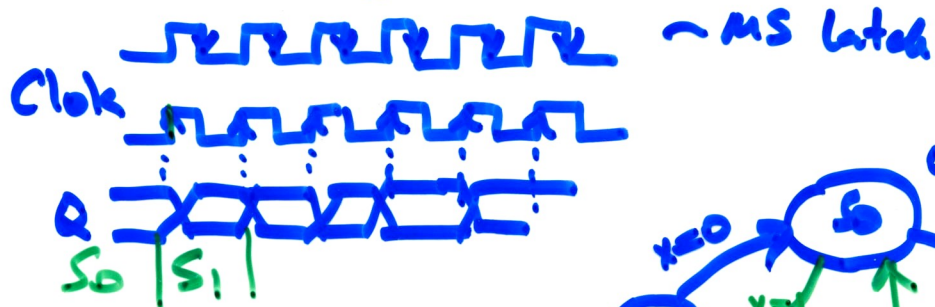
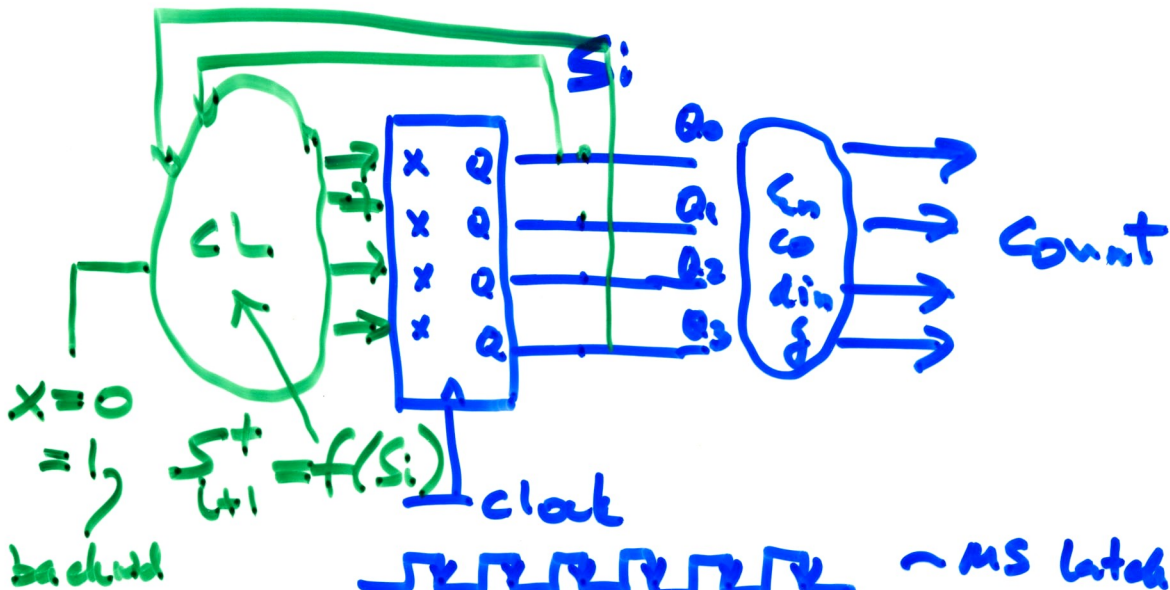


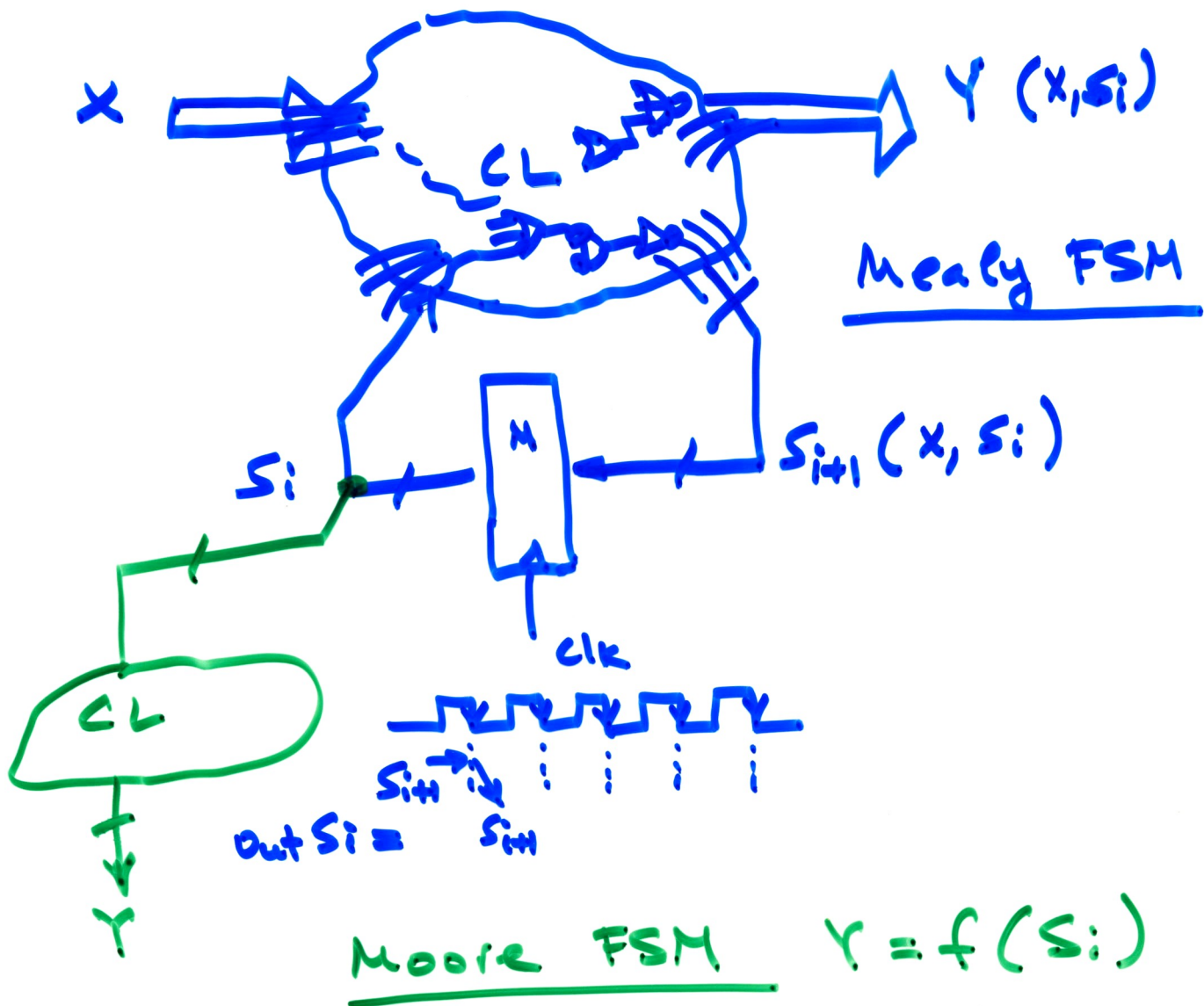
FSM



$$S_{i+1} = f(S_i, x)$$

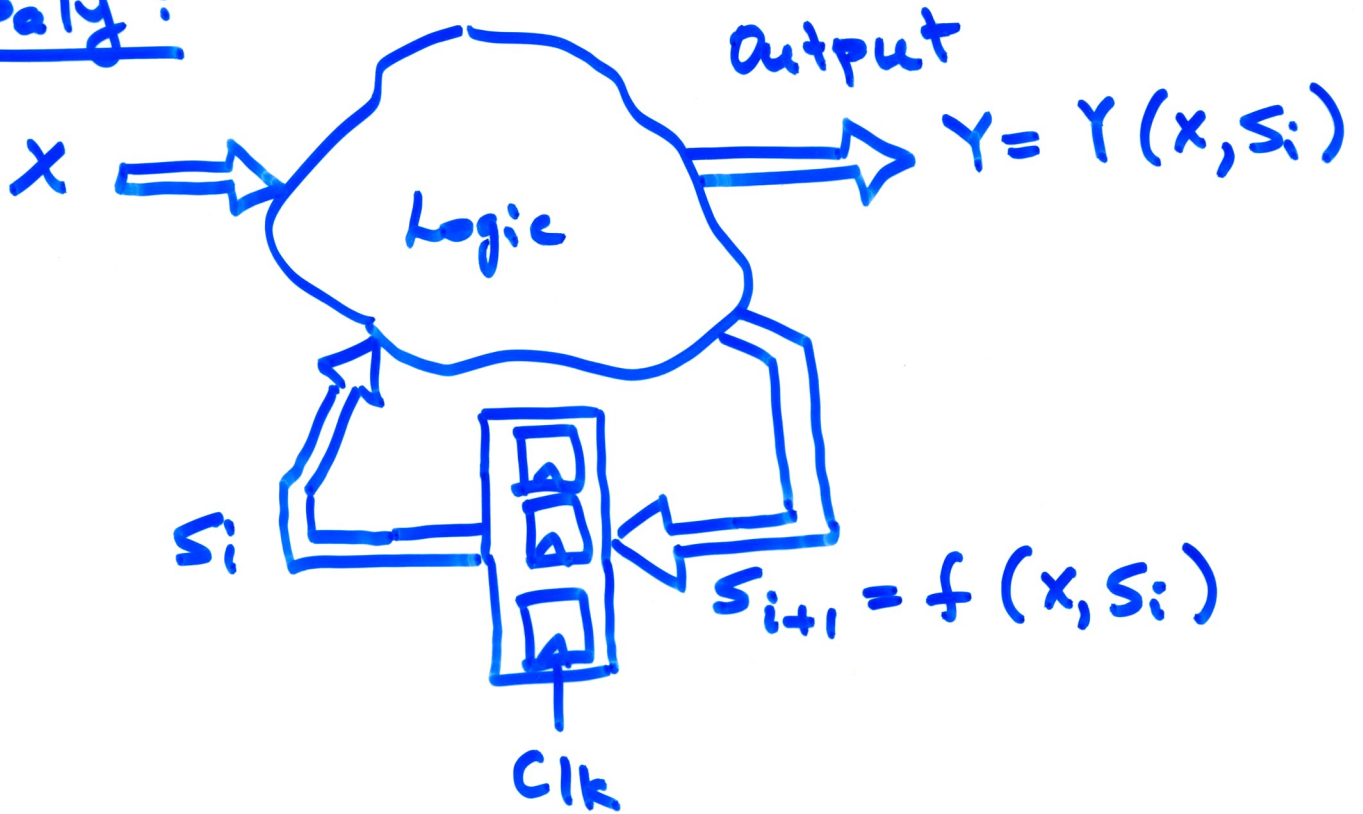
x	S_i	S_{i+1}	S_i	R_i	S_0	S_1	S_2	$z_i = \psi(x, S_i)$
0	0	0	0	-	1	0	0	0000
0	0	1	1	0	0	0	1	0001
0	1	0	0	-	0	1	0	0010
0	1	1	1	0	1	1	0	0011
1	0	0	0	-	0	0	0	0000
1	0	1	1	0	0	0	1	0001
1	1	0	0	-	0	1	0	0010
1	1	1	1	0	1	1	0	0011

FSM

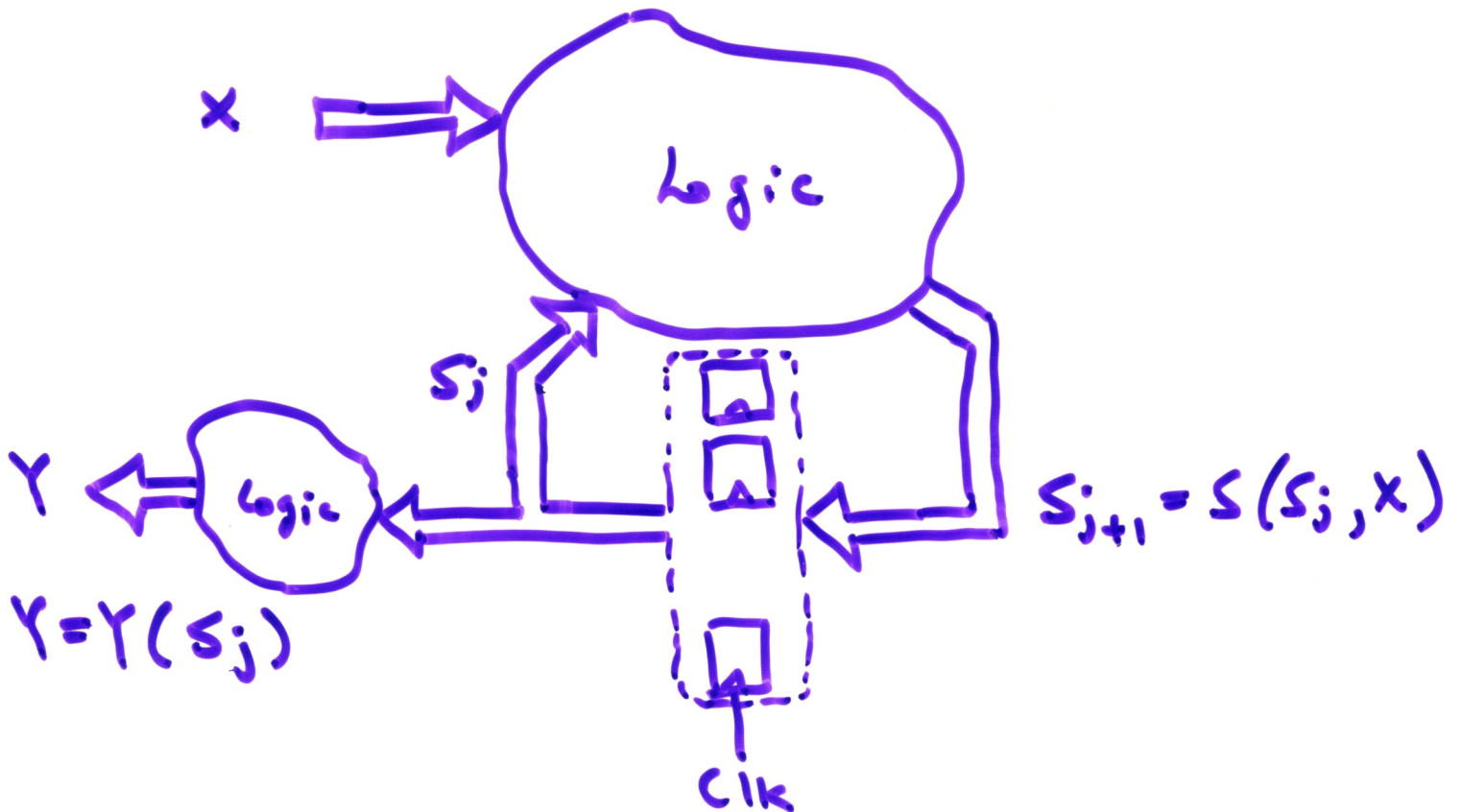


FSM

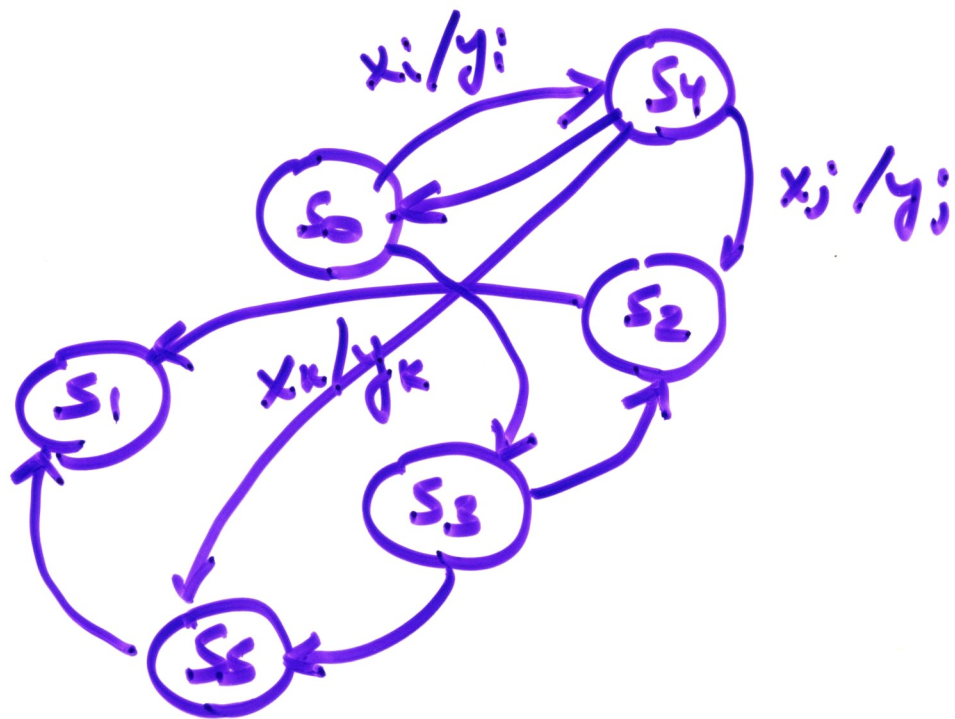
Mealy:



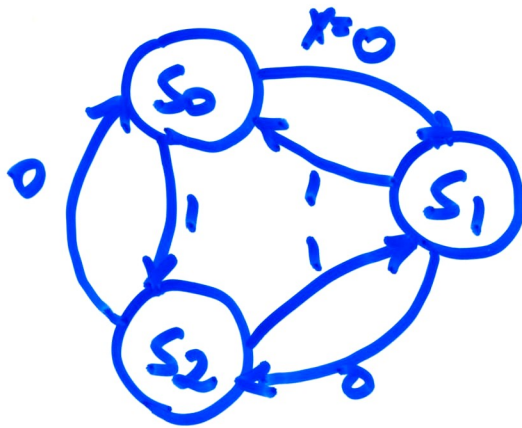
Moore FSM:



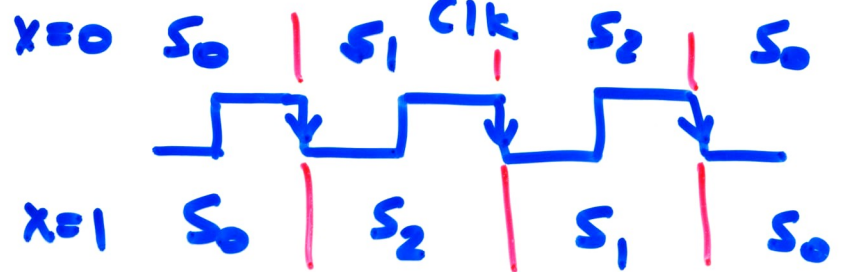
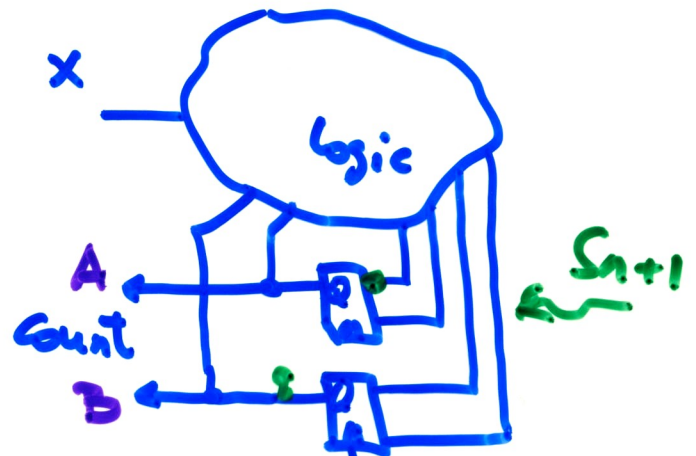
Mealy FSM:



Up / Down Counter

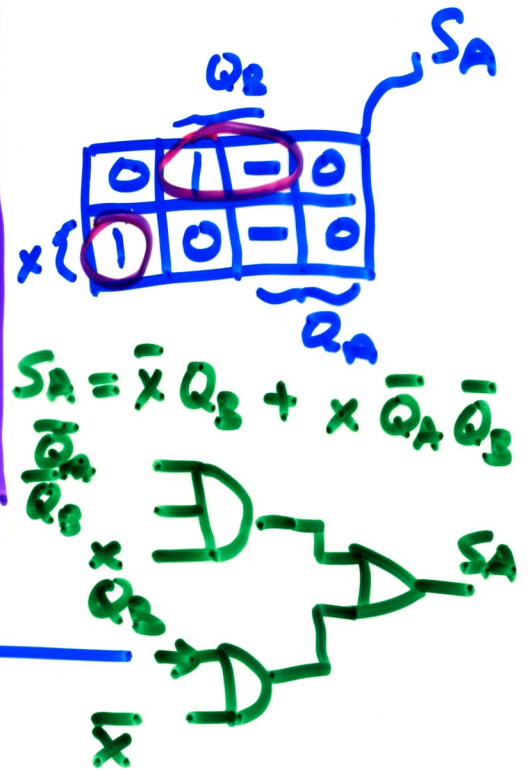


S_3

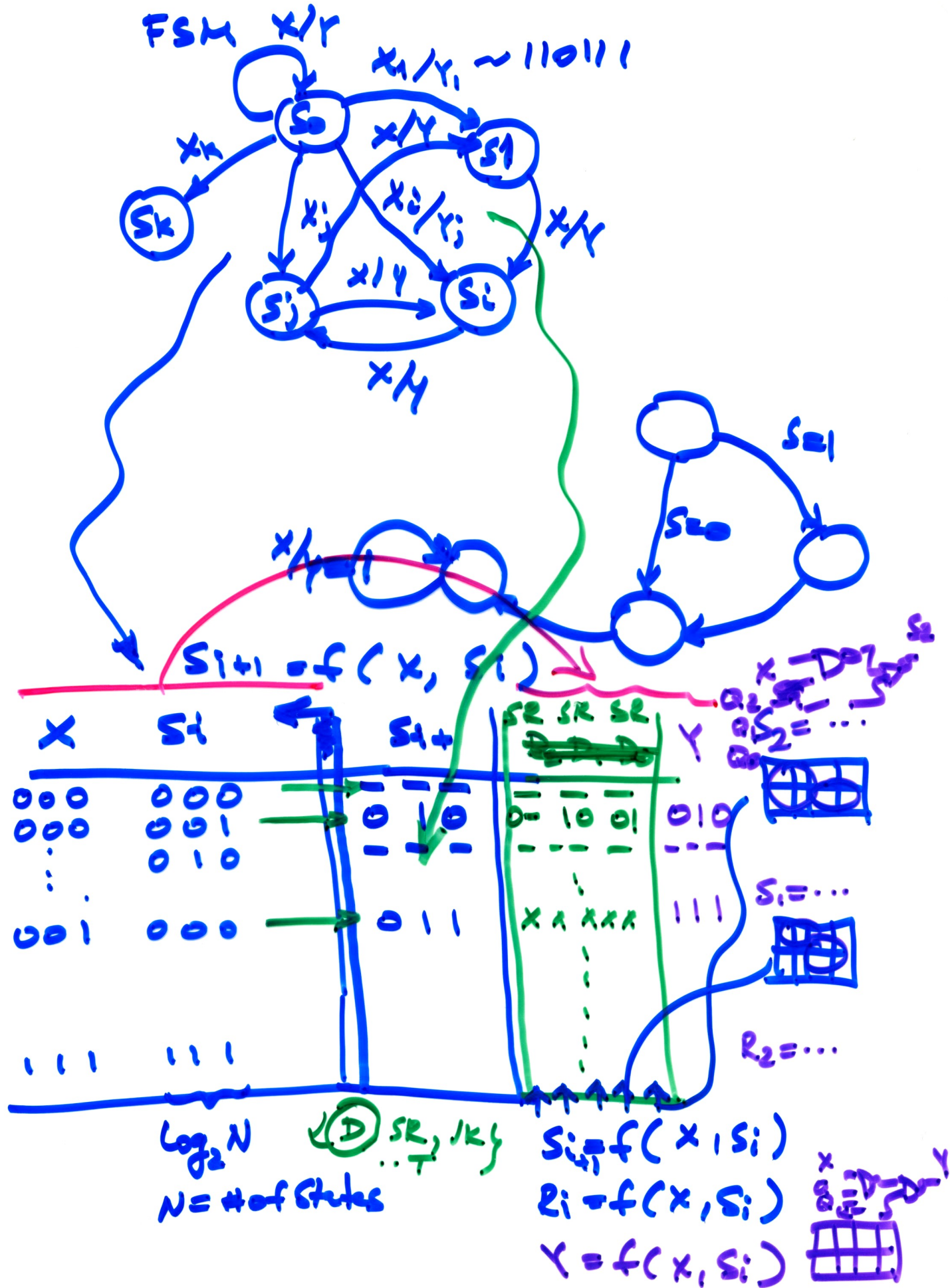


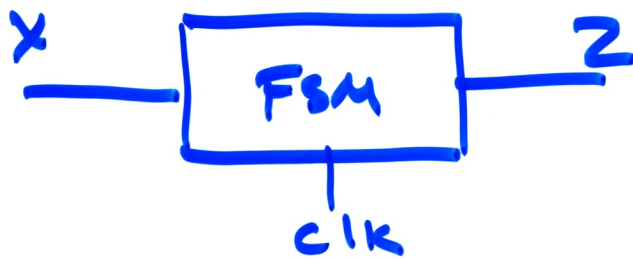
X	S_n		S_{n+1}					
	Q_A	Q_B	Q_A	Q_B	S_A	R_A	S_B	R_B
0	0	0	0	1	0	-	1	0
0	0	1	1	0	1	0	0	1
0	1	0	0	1	0	1	0	-
0	1	1	0	0	1	0	-	-
1	0	0	0	1	0	0	-	-
1	0	1	1	0	0	1	-	-
1	1	0	0	1	-	-	-	-
1	1	1	0	0	-	-	-	-

↑
"0" bar

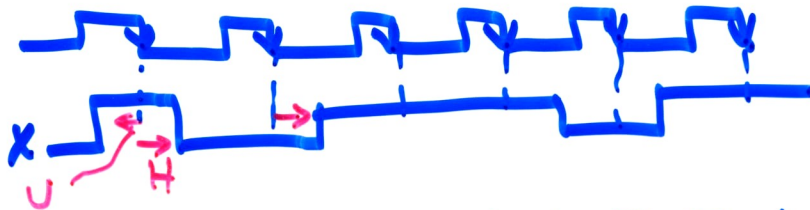


FSM x/y $x_1/y_1 \sim 110111$



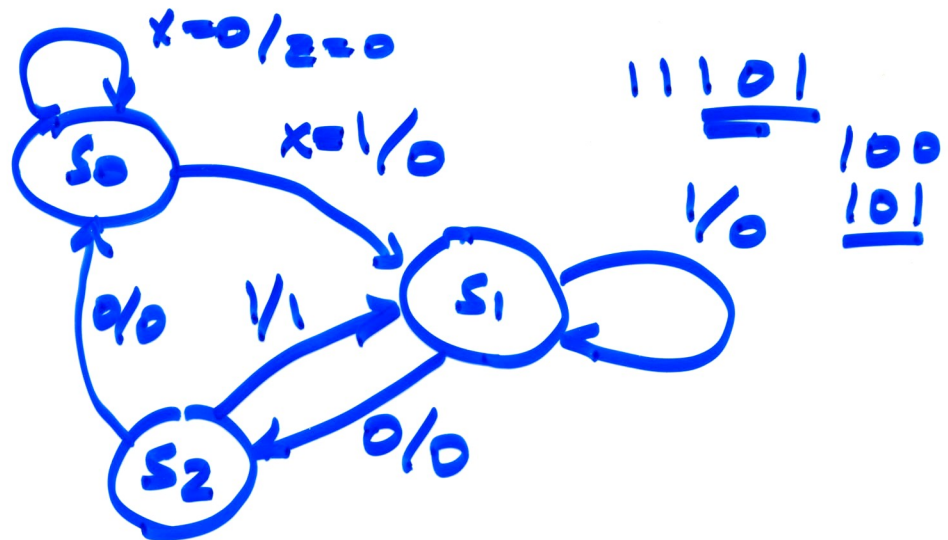


Comb lock.

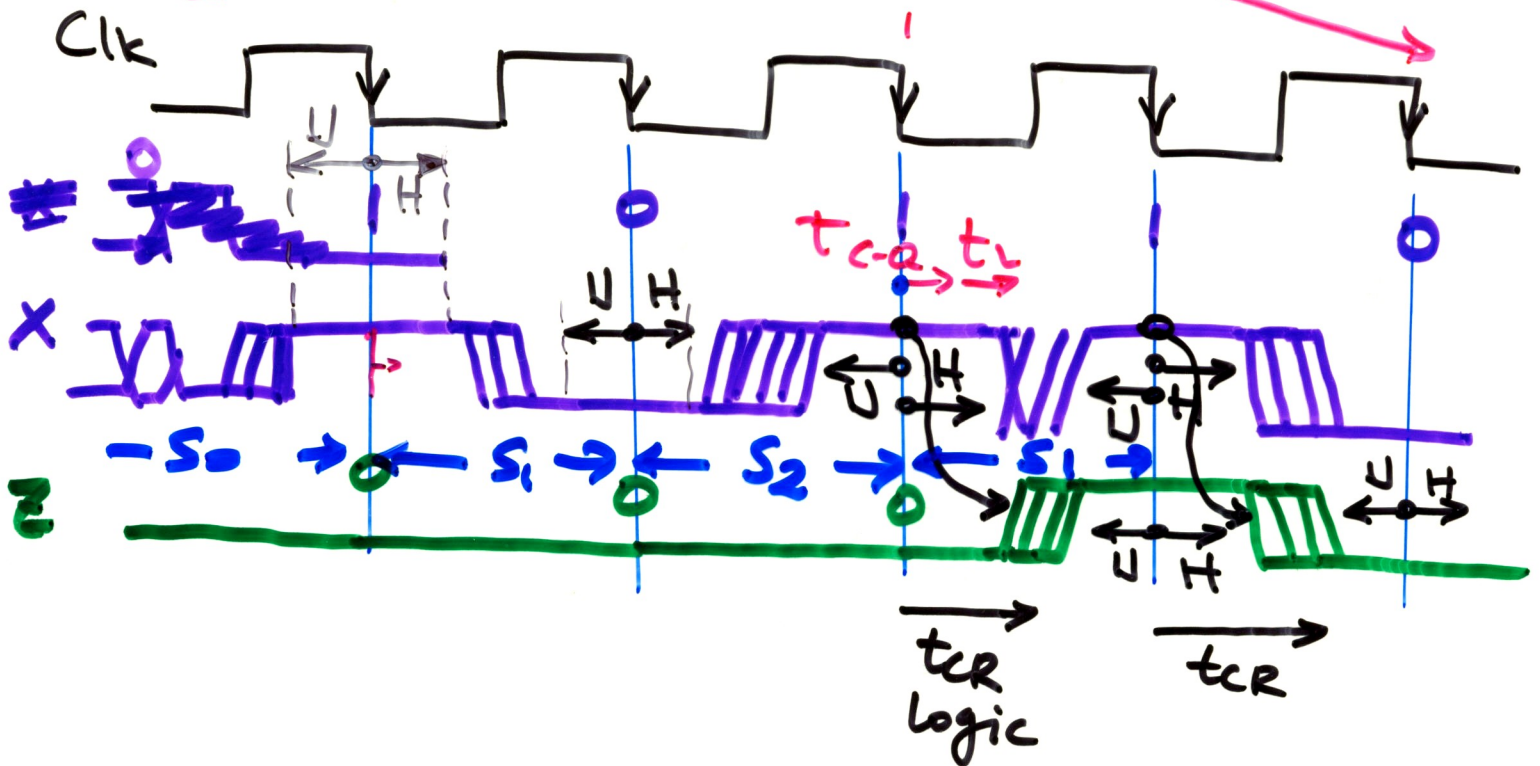
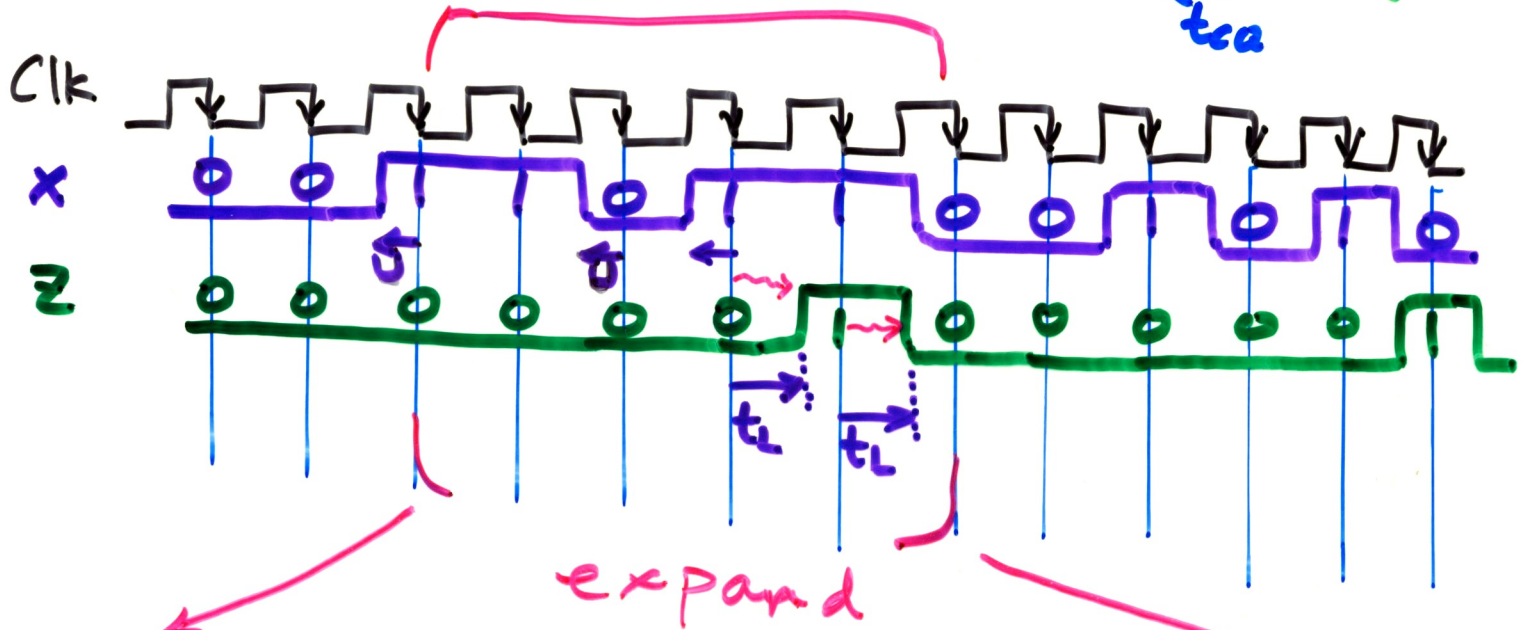
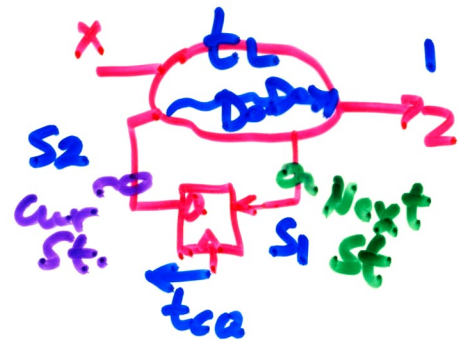
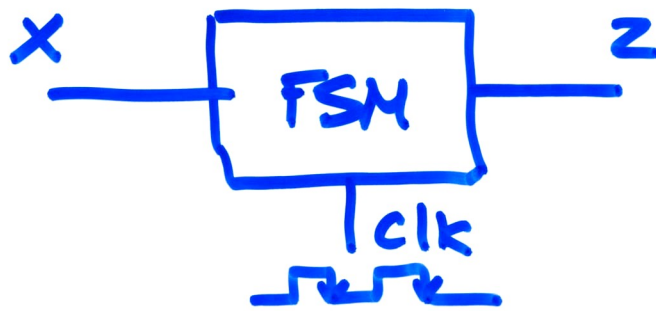


$X = 0011011001010100$

$Z = 00000100000010100$



Example: Combinational Lock



	B			
	0	1	-	0
X {	0	0	-	0
	A			

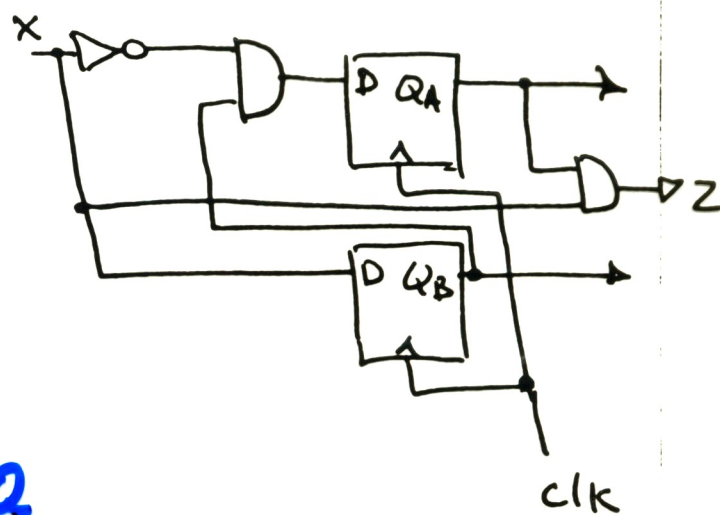
$$D_A = \bar{X} B$$

	B			
	0	0	-	0
X {	1	1	-	1
	A			

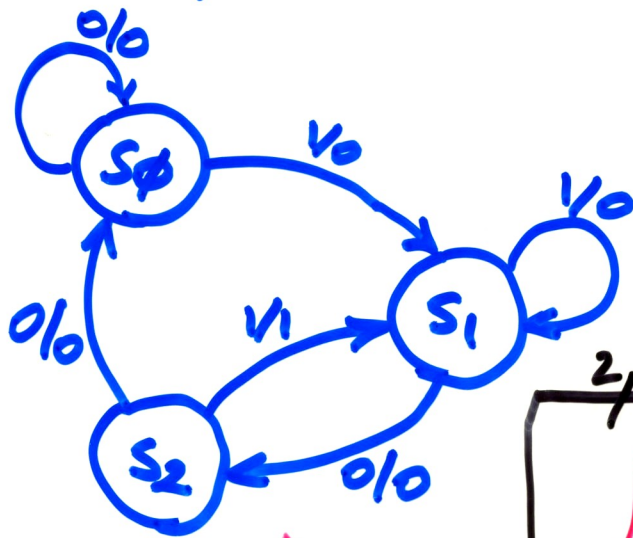
$$D_B = X$$

	B			
	0	0	-	0
X {	0	0	-	1
	A			

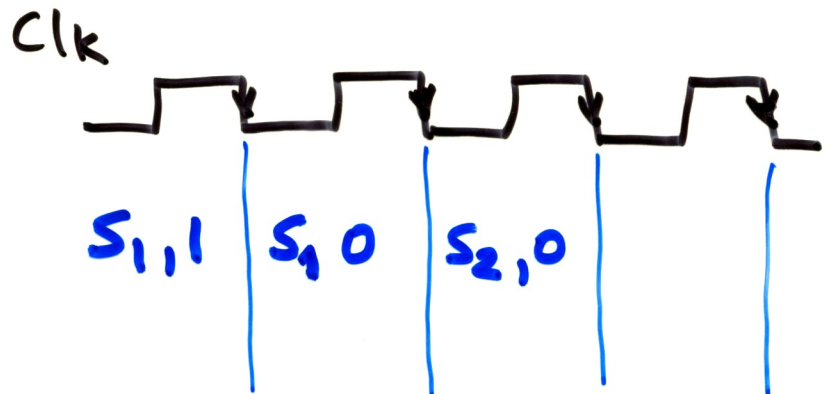
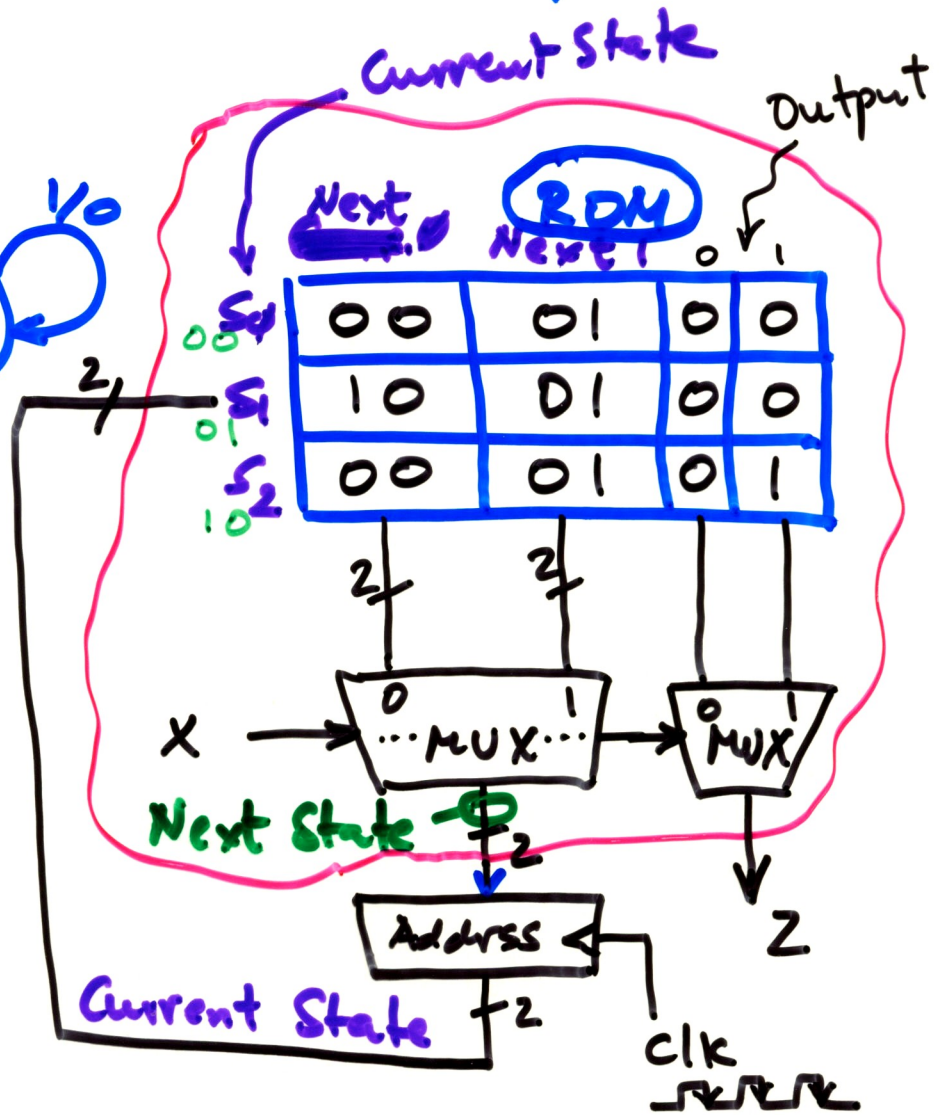
$$Z = X A$$



Example: FSM Different Implement.

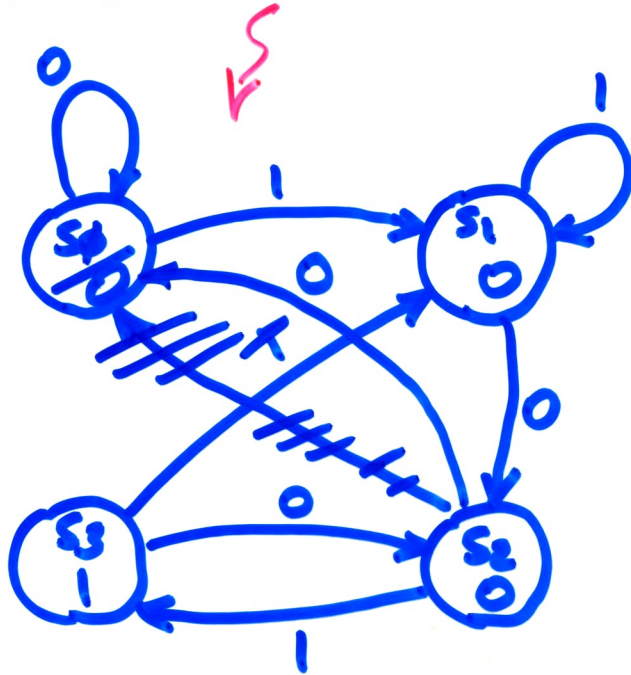


Mealy Machine

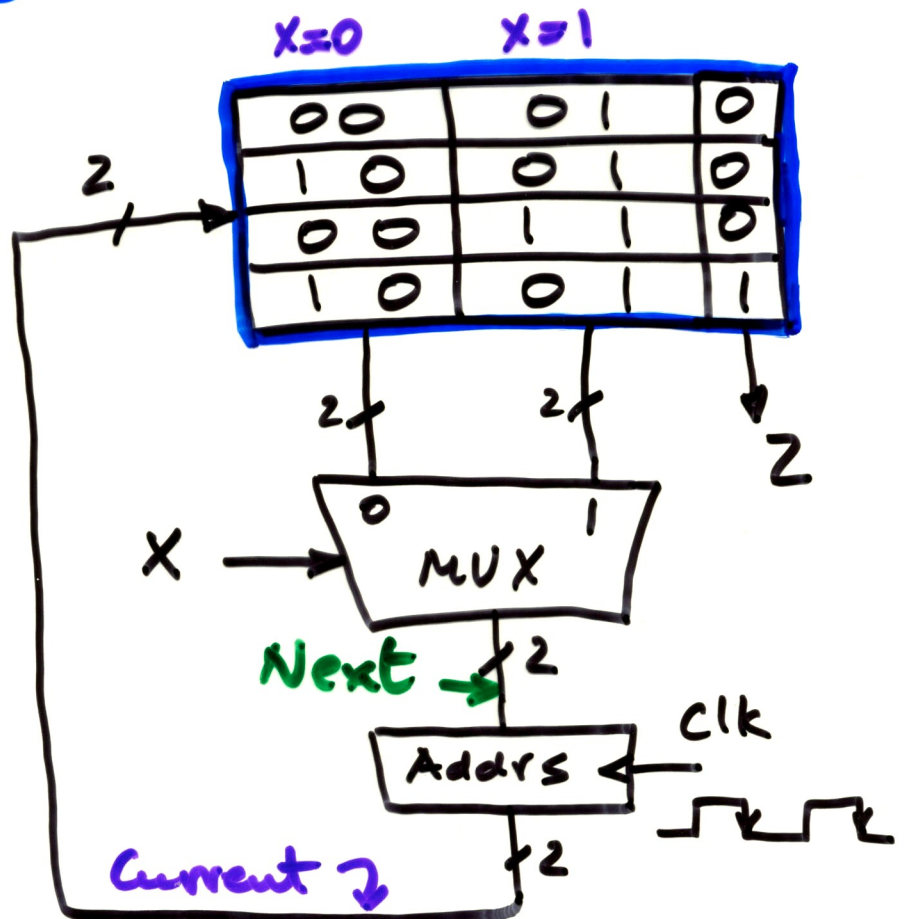


Example: FSM Diff. Implement.

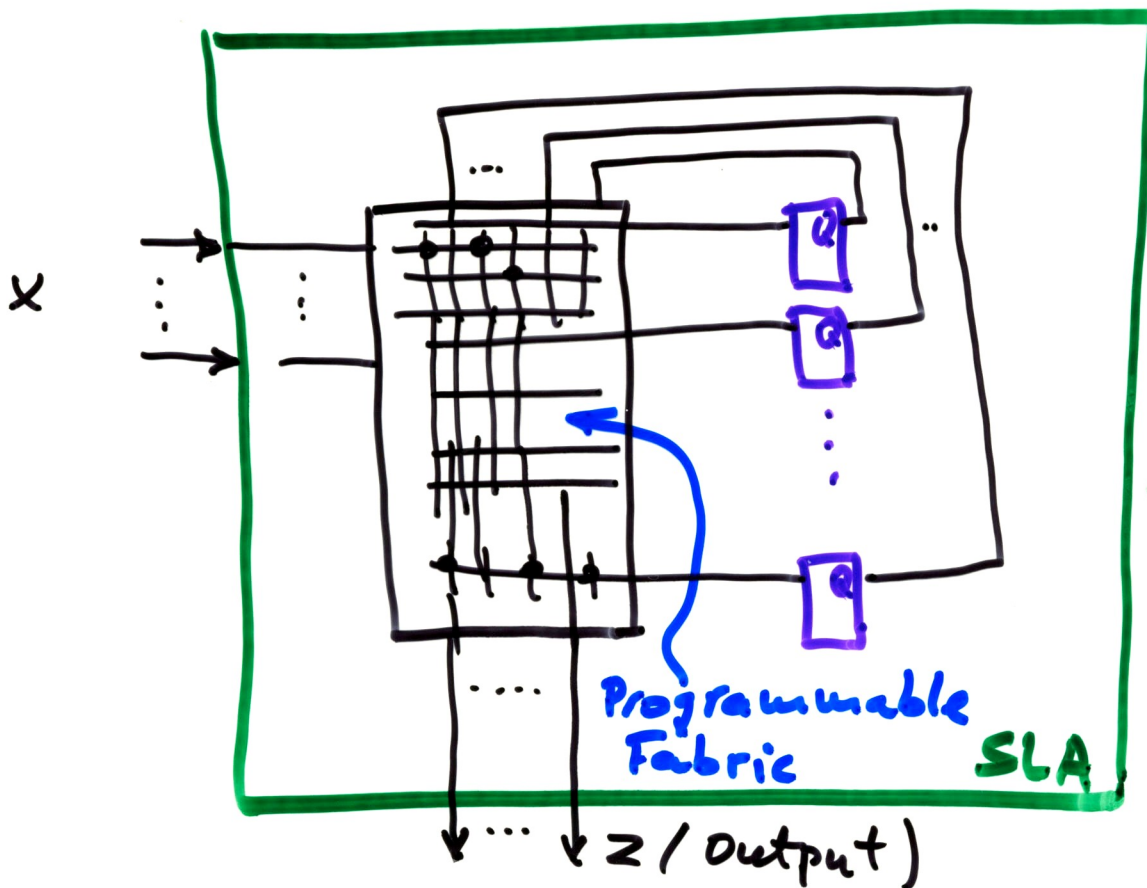
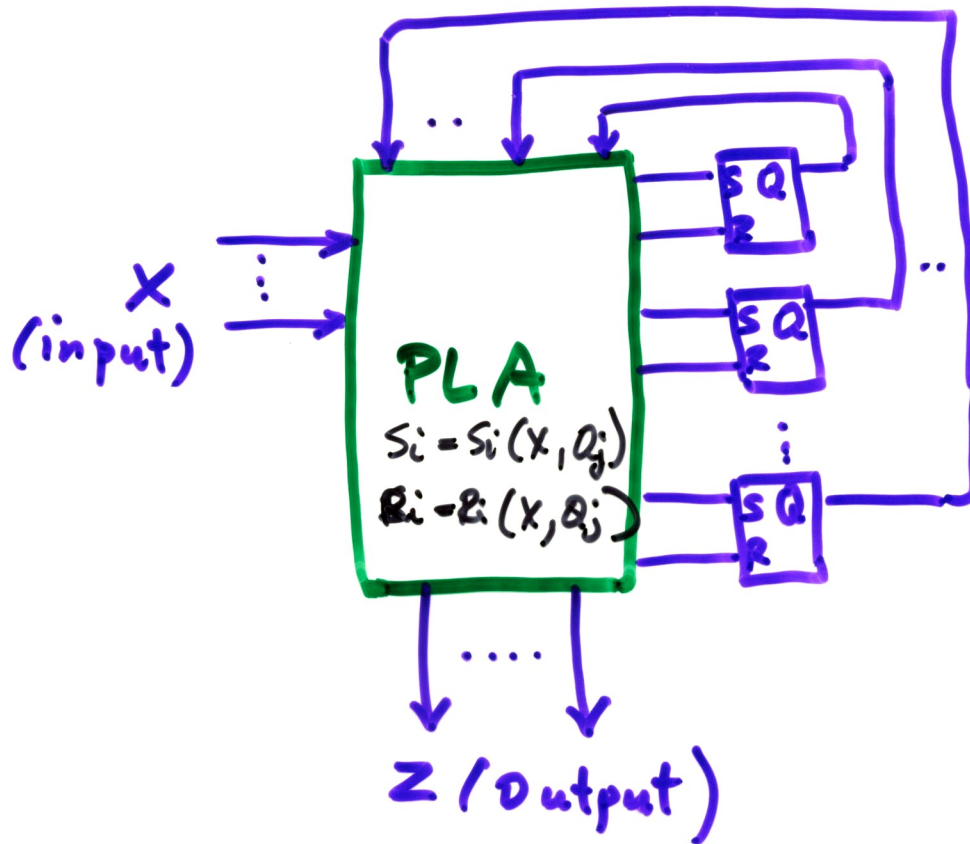
Moore Machine



ROM Impl.



Example: Alternate FSM Impl.

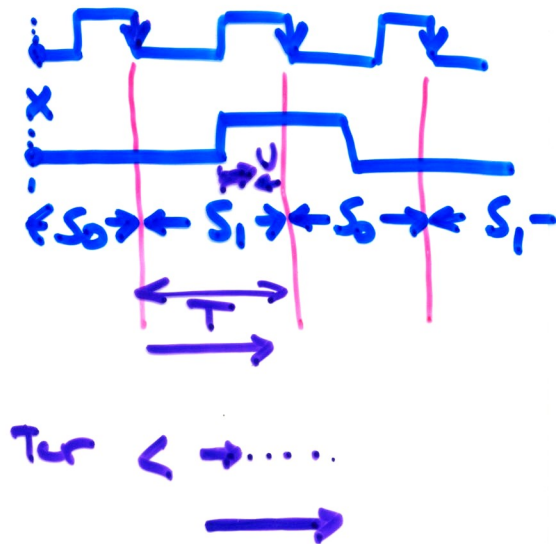
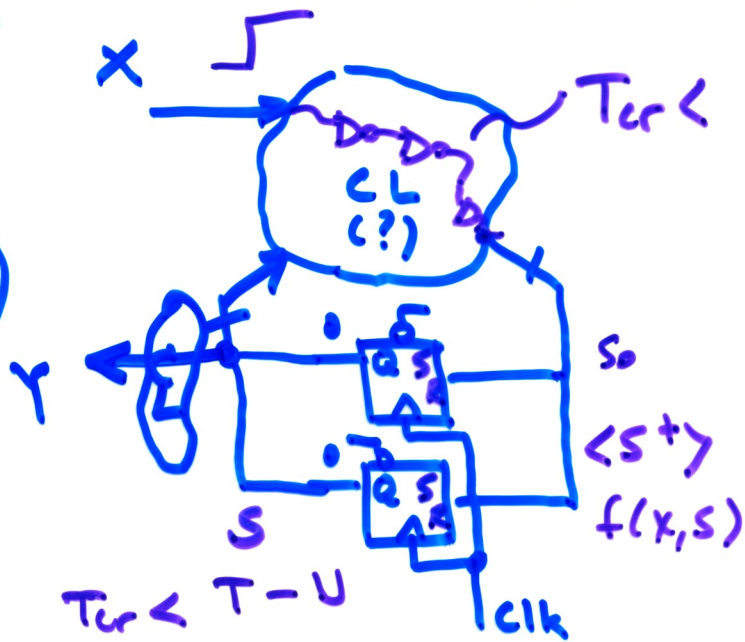
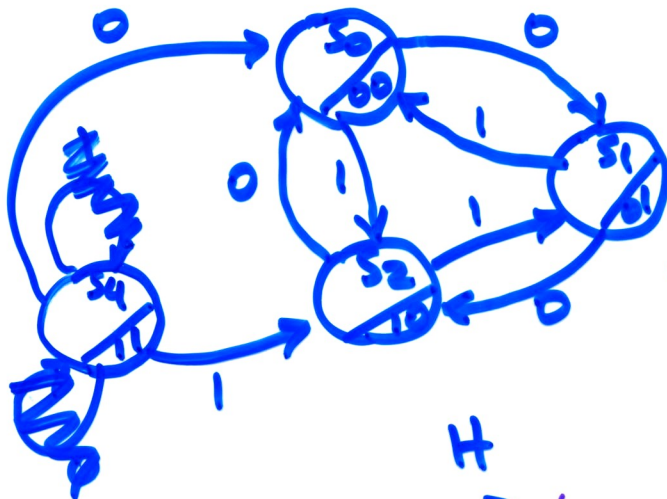


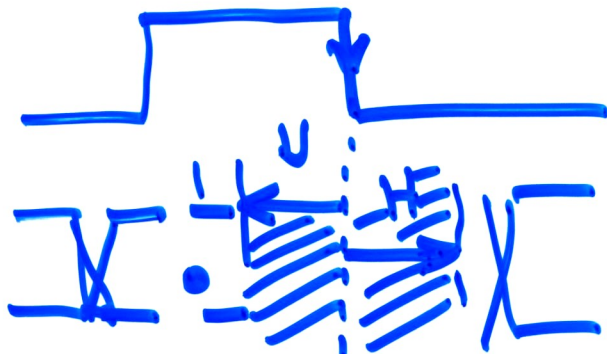
😊 Suhas Patil

FSM :

Ex: Counter, $X = \begin{cases} 0 & \text{up} \\ 1 & \text{down} \end{cases}$, $Y = \begin{matrix} x=0 \\ 00, 01, 10, 00 \\ x=1 \\ 00, 10, 01, 00 \\ \dots \end{matrix}$

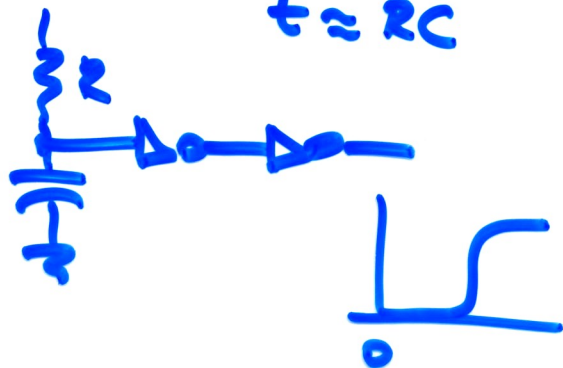
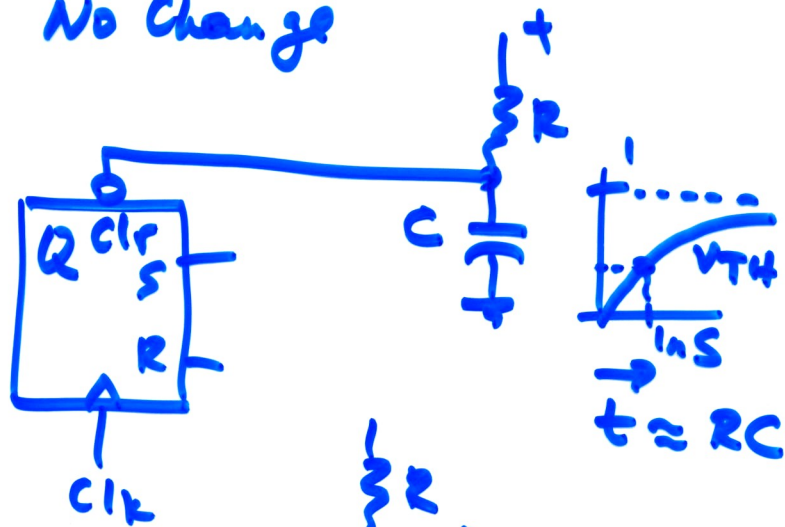
$$k=3, N = \lceil \log_2 k \rceil = 2$$





trig
circuit
 $U + H$

No Change



S			S^+		Y	S, R, S_0, R_0			
X	Q_1	Q_0	Q_1	Q_0		S_1	R_1	S_0	R_0
0	0	0	1	0	0	1	0	.	.
0	0	1	1	1	1	1	1	.	.
0	1	0	1	1	0	1	0	.	.
0	1	1	0	0	0	0	1	.	.
1	0	0	1	1	0	.	.	.	.
1	0	1	1	1	1	.	.	.	.
1	1	0	0	0	0	.	.	.	.
1	1	1	1	0	1	.	.	.	.

$S_1 = f(X, S)$
 $R_1 = f(X, S) R_0$

State Assignment:

$S_0 =$	00	00	00	00	00	00
$S_1 =$	10	01	01	10	10	11
$S_2 =$	11	10	11	01	11	01

$k = 6$