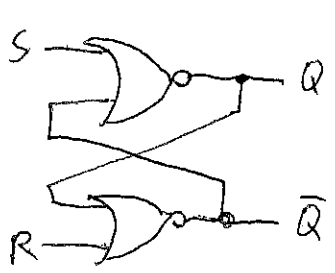
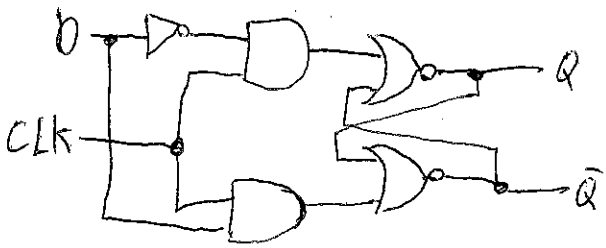
7.1



- If either input to a NOR is 1, the output must be 0, so if $S=R=1$, $Q=\bar{Q}=0$.
- If $S=1$, then $Q=0$, and if $R=0$, $\bar{Q}=1$.
- If $R=1$, then $\bar{Q}=0$, and if $S=0$, $Q=1$.
- If $S=R=0$, there are two stable outputs: $Q=1$ and $\bar{Q}=0$, or $Q=0$ and $\bar{Q}=1$.

7.2.



- This is different from the book's result because they reverse the positions of S and R (which is the standard NOR latch - but that's not obvious from the problem statement)

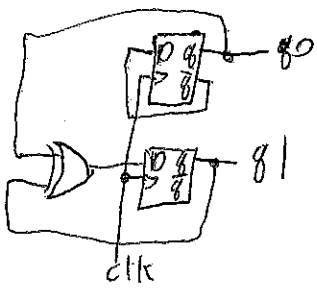
7.3.

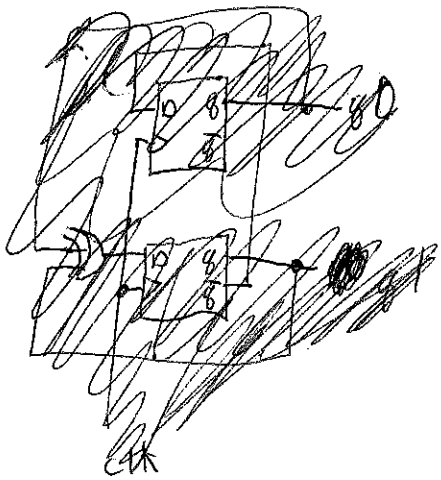
Current state		next state	
q1	q0	d1	d0
0	0	0	1
0	1	1	0
1	0	1	1
1	1	0	0

a. $d1 = q0 \oplus q1$

$d0 = \overline{q0}$

b.





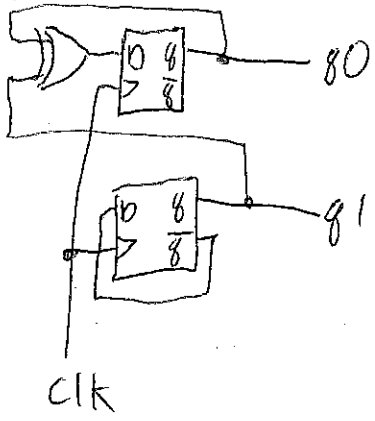
7.5

current state		next state	
q1	q0	D1	D0
0	0	1	0
0	1	1	1
1	0	0	1
1	1	0	0

a. $D1 = \overline{q1}$

$D0 = q1 \oplus q0$

b.



7.6

$q3$	$q2$	$q1$	$q0$
1	0	0	0
1	1	0	0
1	1	1	0
1	1	1	1
0	1	1	1
0	0	1	1
0	0	0	1
0	0	0	0

$D3 = \overline{q0}$, $D2 = q3$, $D1 = q2$, $D0 = q1$

8.2. s0: detected nothing correct

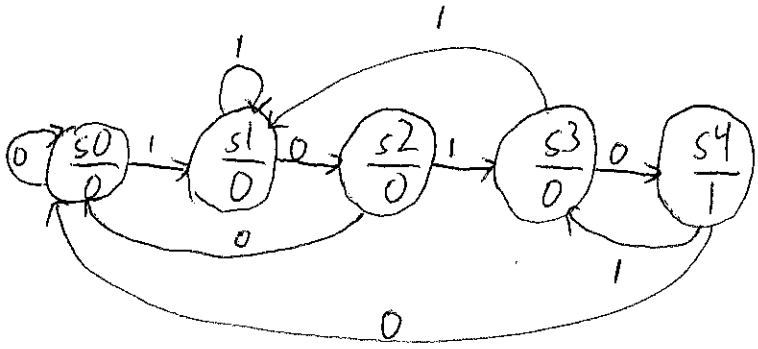
s1: detected 1

s2: detected 10

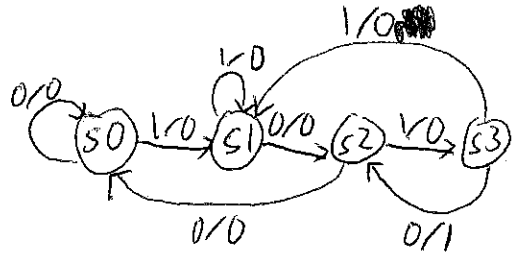
s3: detected 101

s4: detected 1010

Moore:

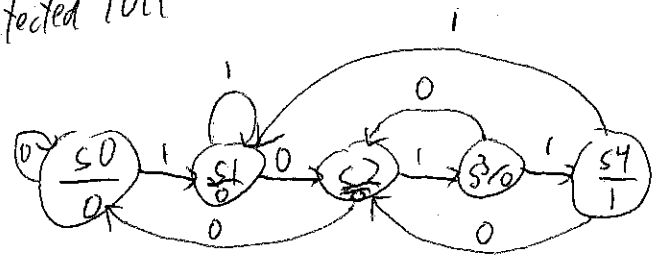


Mealy:

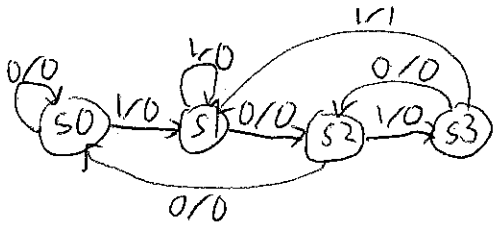


8.3. s0: detected nothing correct
s1: detected 1
s2: detected 10
s3: detected 101
s4: detected 1011

Moore:

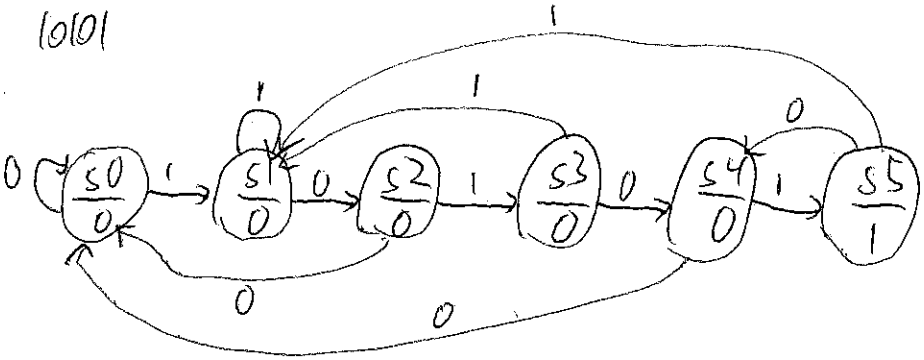


Mealy:

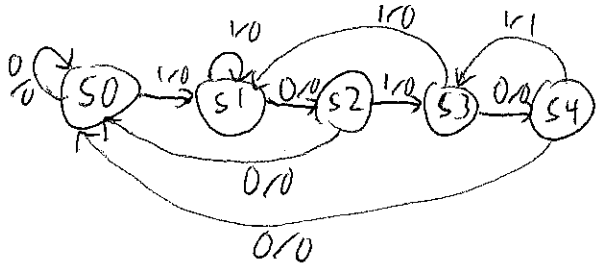


8.4. s0: detected nothing correct
s1: detected 1
s2: detected 10
s3: detected 101
s4: detected 1010
s5: detected 10101

Moore:



Mealy:



8.5 S0: detected nothing correct

S1: detected 1

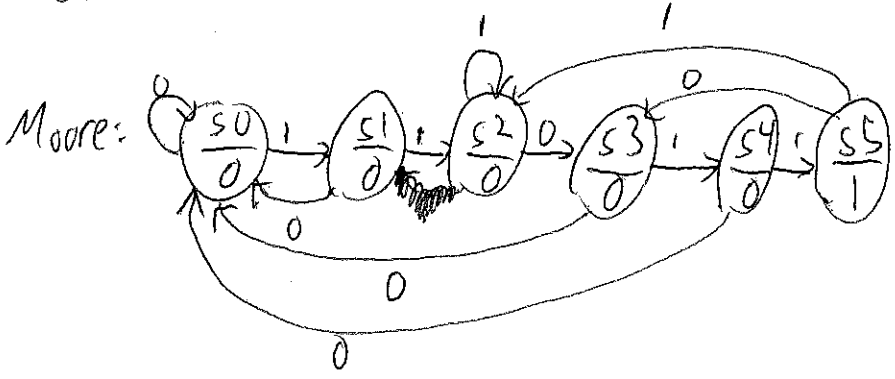
S2: detected 11

S3: detected 110

S4: detected 1101

S5: detected 11011

Moore:



Mealy: