Pre-lab Report 5 Alan Biju Palayil

ECE 218- L01 Lab Date: 03/08/2021

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Preliminary Questions:

1.

Present State		Next State		D1		D0		C	
State Name	AB	x=0	x=1	0	1	0	1	0	1
S_3	00	S_3	S_0	0	1	0	0	0	1
S_2	01	S_2	S_3	0	0	1	0	0	0
S_1	11	S_1	S_2	1	0	1	1	0	0
S_0	10	S_0	S_1	1	1	0	1	0	0

A\Bx	00	01	11	10
0	0	1	0	0
1	1	1	0	1

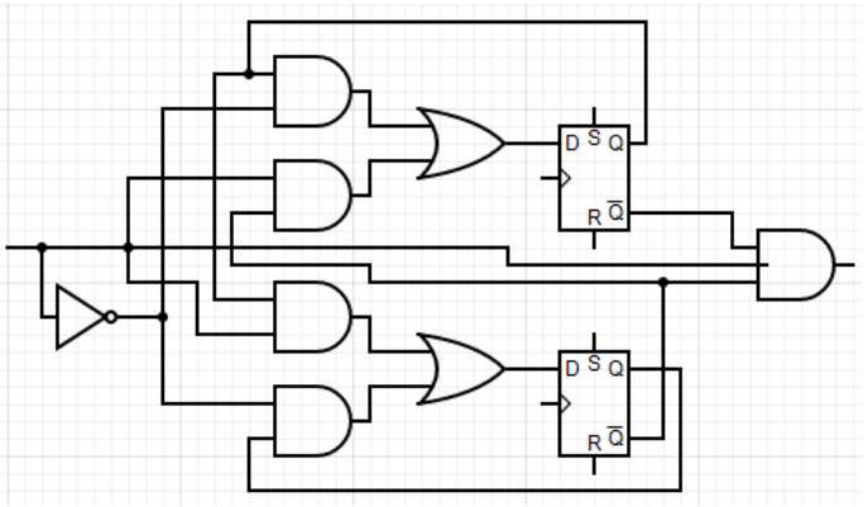
$$D_1 = B'x + Ax'$$

A\Bx	00	01	11	10
0	0	0	0	1
1	0	1	1	1

$$D_0 = Ax + Bx'$$

A\Bx	00	01	11	10
0	0	1	0	0
1	0	0	0	0

$$C = A'B'x$$



The S and R inputs are not used and are to be ignored. The top DFF is D_1 and bottom DFF is D_0.

2.

L	R	PS	NS	LL	HL	RL
0	0	IDLE	IDLE	0	0	0
0	1	IDLE	RSIG	0	0	0
1	0	IDLE	LSIG	0	0	0
1	1	IDLE	H1	0	0	0
X	X	RSIG	IDLE	0	0	1
X	X	LSIG	IDLE	1	0	0
X	X	H1	H2	1	0	1
X	X	H2	IDLE	0	1	0

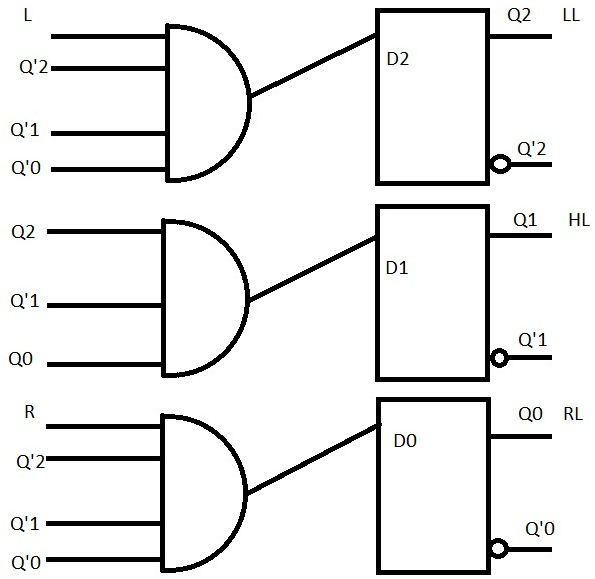
3.

Input		Present State		Next State		Output
L	R	PS	$Q_2Q_1Q_0$	NS	$D_2D_1D_0$	LL HH RL
0	0	IDLE	000	IDLE	000	000
0	1	IDLE	000	RSIG	001	000
1	0	IDLE	000	LSIG	100	000
1	1	IDLE	000	H1	101	000
X	X	RSIG	001	IDLE	000	001
X	X	LSIG	100	IDLE	000	100
X	X	H1	101	H2	010	101
X	X	H2	010	IDLE	000	010

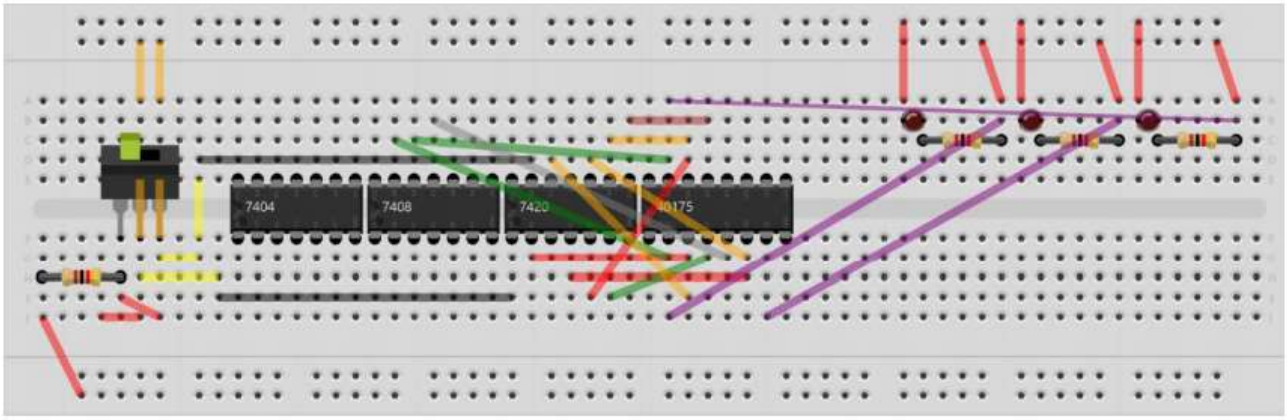
4. Another restriction in out-coded state assignments is the binary representation of the number of states must have the same number of bits as there are output bits.

5. $D_2 = Q'_2Q'_1Q'_0L$
   $D_1 = Q_2Q'_1Q_0$
   $D_0 = Q'_2Q'_1Q'_0R$

Schematics:



Breadboard Layout:



Data Sheet:

L	R	LL	HL	RL
LOW	LOW			
LOW	HIGH			
HIGH	LOW			
HIGH	HIGH			