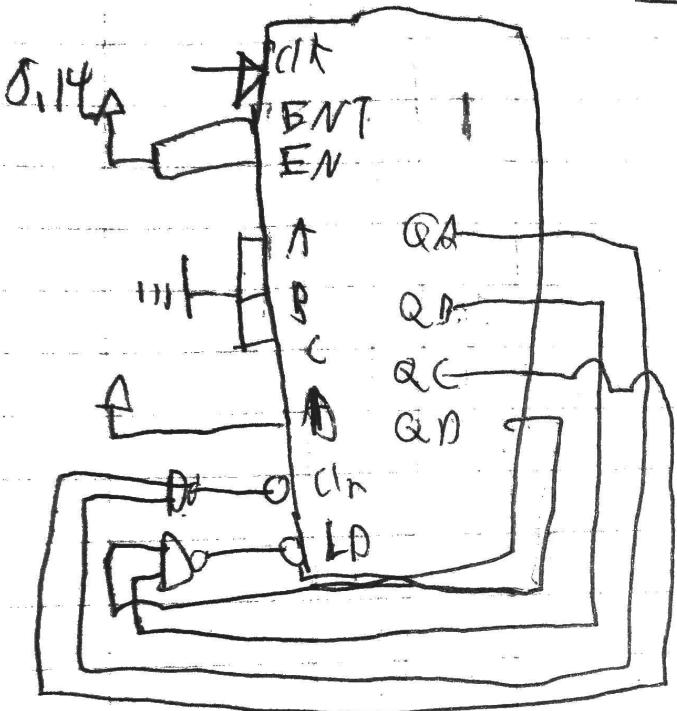


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ahmeds7

IV/4/e4  
661925948

Coco HW #9



States : A B C D

0 0 0 0

0 0 0 1

0 0 1 0

0 0 1 1

0 1 0 0

0 1 0 1

0 0 0 1

0 0 1 0

0 0 1 1

0 1 0 0

0 1 0 1

0 0 0 1

0 0 1 0

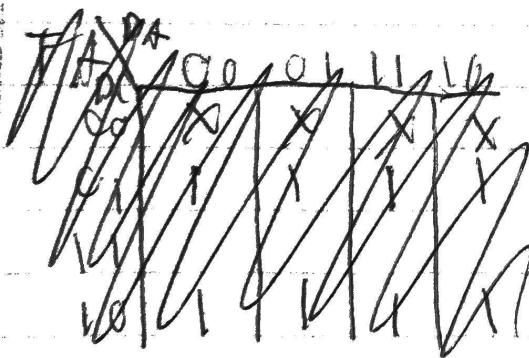
0 0 1 1

0 1 0 0

0 1 0 1

8.35

Current State				Next State				T Flip Flop			
D	C	B	A	D'	C'	B'	A'	TD	TC	TB	TA
0	1	0	0	0	1	0	1	0	0	0	1
0	1	0	1	0	1	1	0	0	0	1	1
0	1	1	0	0	1	1	1	0	0	0	1
0	1	1	1	1	0	0	0	1	0	1	1
1	0	0	0	1	1	0	0	0	0	0	1
1	0	0	1	1	0	1	0	0	0	1	1
1	0	1	0	1	0	1	1	0	0	0	1
1	0	1	1	1	1	0	0	0	1	1	1
1	1	0	0	1	1	0	1	0	0	0	1
1	1	0	1	1	1	1	0	0	0	1	1
1	1	1	0	0	1	0	0	1	0	1	0
0	1	0	0	0	0	1	0	0	0	0	1
0	1	0	1	0	0	1	0	0	0	1	1
0	1	1	0	0	1	1	1	0	0	0	1
0	1	1	1	1	0	0	0	1	1	1	1
1	0	0	0	1	0	0	1	0	0	0	1



TA

DC	00	01	11	10
DA	X	X	X	X
BA	X	X	X	X
TA	X	X	X	X

$$= \bar{B} + \bar{D} + \bar{C}$$

TB

DC	00	01	11	10
DA	X	0	0	0
BA	X	1	1	1
TA	X	1	X	1

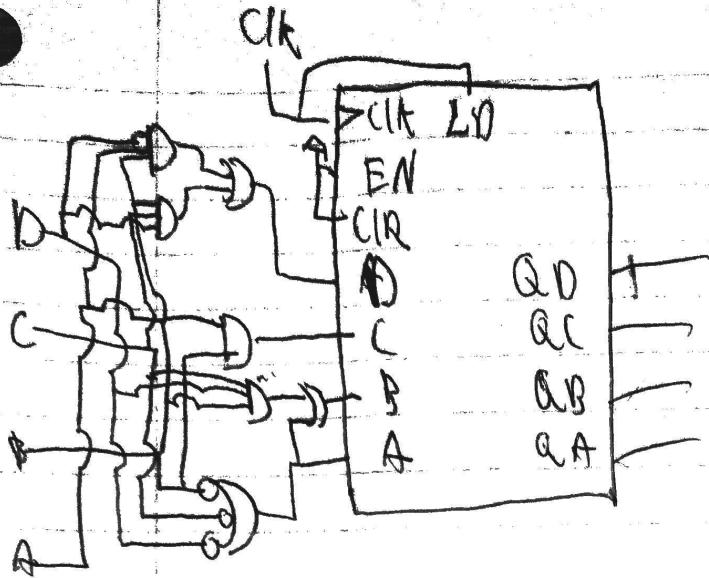
$$A = DCB$$

TC

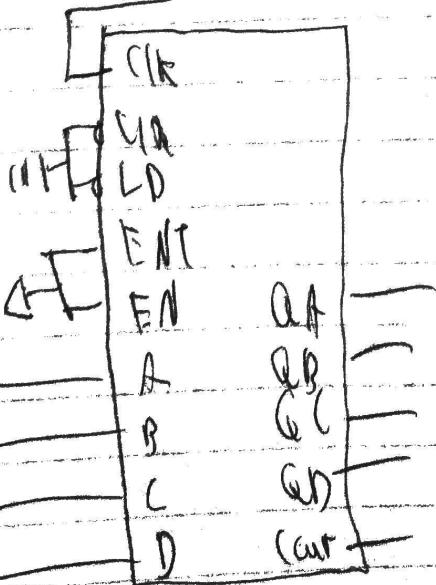
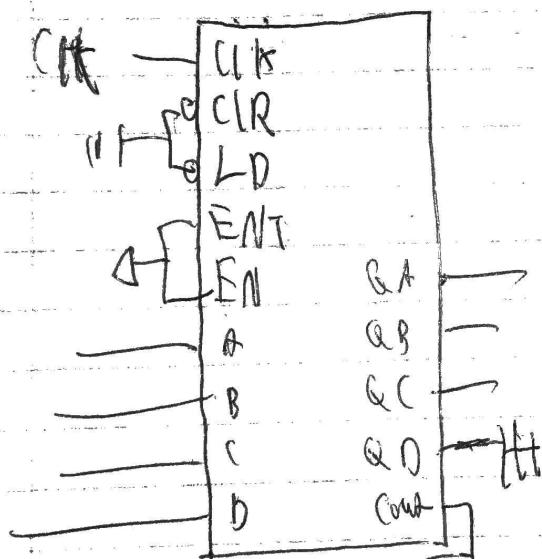
DC	00	01	11	10
DA	X	0	0	0
BA	X	0	0	0
TA	X	1	X	1

TD

DC	00	01	11	10
DA	X	0	0	0
BA	X	0	0	0
TA	X	1	X	0



8.38:



4.

	C	B	A	$C^+$	$B^+$	$A^+$	T <sub>C</sub>	T <sub>B</sub>	T <sub>A</sub>
0	0	0	0	0	0	1	0	0	1
1	0	0	1	0	1	1	1	0	0
2	0	1	1	1	0	1	1	1	1
3	1	0	1	0	1	0	1	1	0
4	1	0	0	1	1	0	0	1	0
5	1	0	0	0	1	0	1	1	1
6	1	1	0	0	0	0	1	1	0
7	0	0	0	0	0	1	0	0	1

TA  $\bar{A}CB0001110$

0	1	0	0	0	0	0	0	0	0
1	0	1	0	X	1	1	1	1	1
$\bar{C}B\bar{A} + AC$									

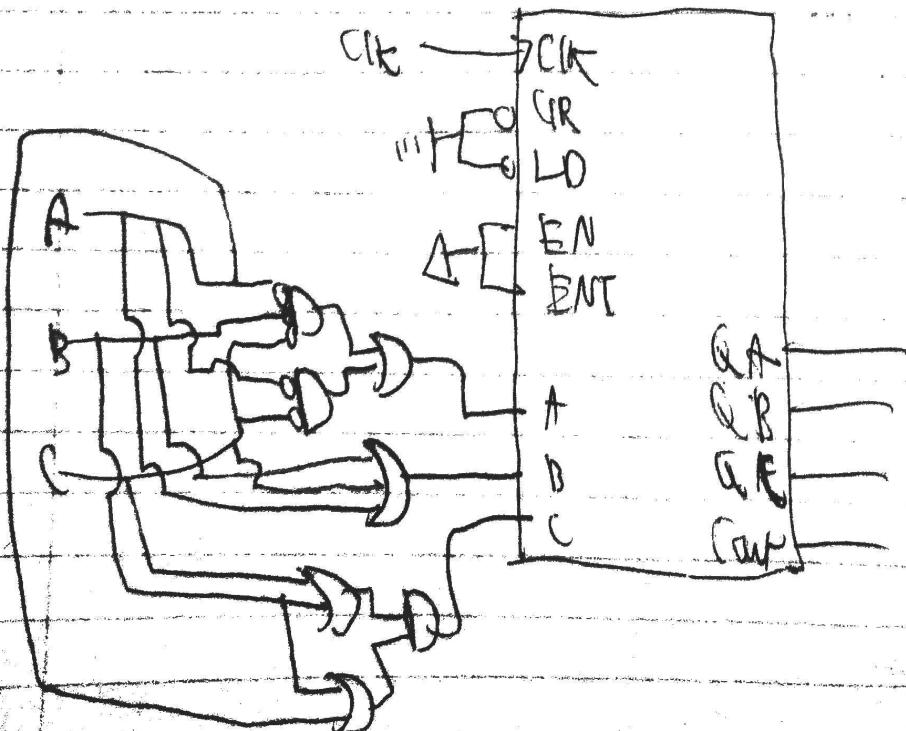
TB  $\bar{A}CB0001110$

0	0	1	1	1	1	1	1	1	1
1	1	0	1	1	1	X	1	1	1
<del>TA</del> $CB + A$									

TC  $\bar{A}CB0001110$

0	0	0	1	1	1	0	0	0	0
1	0	1	1	X	1	1	1	1	1

(H) (B+A)



Saif Ahmed HW 9 Resubmission

## Problem 7:

States: 0000

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卷之三

Fig. 1.

10

010

100

100

10

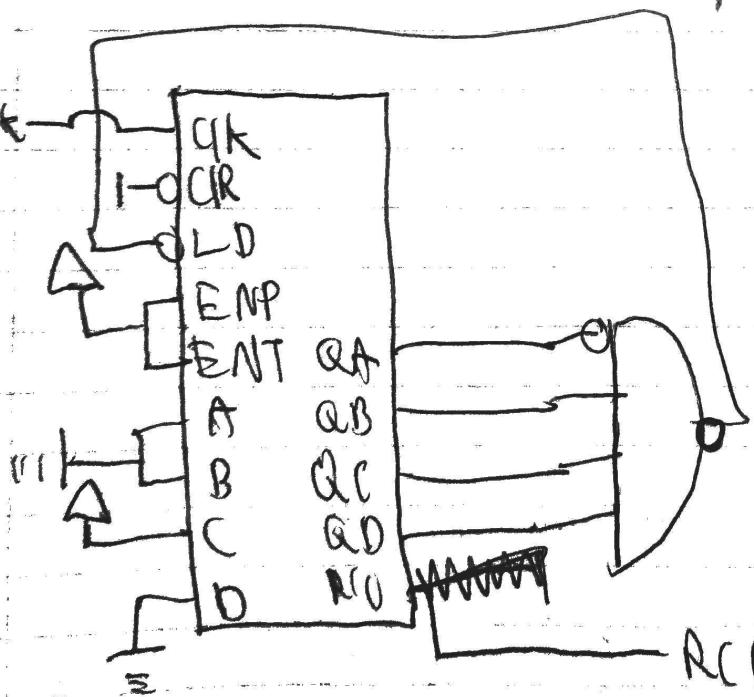
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卷之三

My mistake ~~was~~ was mixing up A and D as most significant and least significant. I see now that the counter runs till 5, counts in 8, runs till 10, and then clears everything.

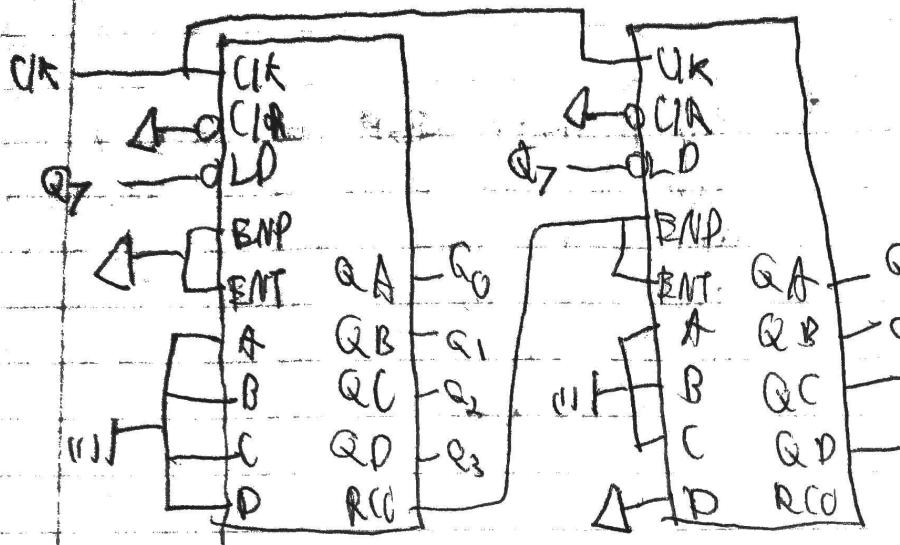
(loops back to 0. (counts 0 - 10)

### Problem 2:



\* I believe I had the right idea though my understanding ~~was~~ was a little over the top.  
I see now how the NAND fires at 1110 to the LO in the new values and start counting again.

### Problem 3:



\* I almost had the right idea. I knew the first 74x163 would control the 2nd, but I didn't realize how the EN pins would be useful. I also forgot to build the cyclical nature of the counter with Q7.

### Problem 4:

C	B	A	$C'$	$B + A'$	Tc	Tb	Ta
0	0	0	0	0	0	0	1
0	0	1	1	0	0	1	0
0	1	0	1	0	1	1	0
0	1	1	1	0	1	1	0
1	0	0	1	1	0	1	0
1	0	1	0	1	1	1	1
1	1	0	0	0	1	1	0
1	1	1	X	X	X	X	X

$$TA \text{ (SOP)} = \cancel{A'BC} + \cancel{ABC} + \cancel{AC}$$

ACB	00	01	10	11
i	1	0	0	X

$$TA = \bar{A}\bar{B}\bar{C} + ABC$$

ACB	00	01	11	10
i	0	0	1	X

TB	ACB	00	01	11	10
i	C	0	1	1	X

$$A + B + C = TB$$

$$TC = CA + CB$$