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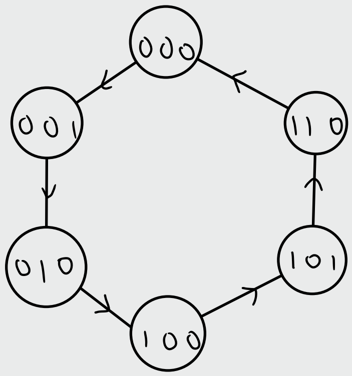
- Implement the sequential circuit needed for the counter of the following sequence (using D flip flops)

0 → 1 → 2 → 4 → 5 → 6

$Q(t)$	$Q(t+1)$	D
0	0	0
0	1	1
1	0	0
1	1	1



	Q(t)			Q(t+1)					
	A	B	C	A	B	C	D_A	D_B	D_C
0	0	0	0	0	0	1	0	0	1
1	0	0	1	0	1	0	0	1	0
2	0	1	0	1	0	0	1	0	0
4	1	0	0	1	0	1	1	0	1
5	1	0	1	1	1	0	1	1	0
6	1	1	0	0	0	0	0	0	0

D_A

A \ BC	00	01	11	10
0			X	1
1	1	1	X	

$D_A = AB' + A'B$

$= A \oplus B$

D_B

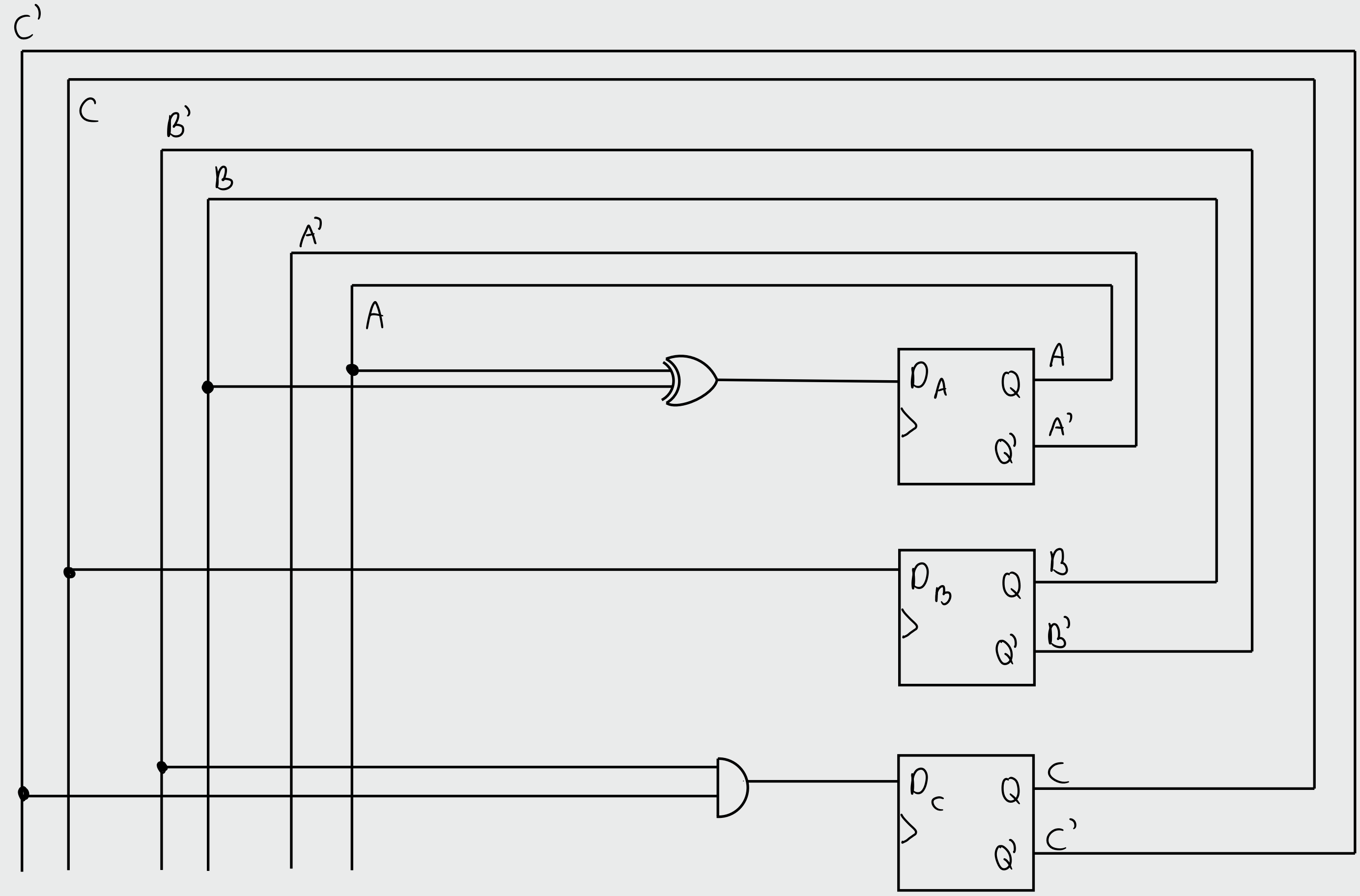
A \ BC	00	01	11	10
0		1	X	
1		1	X	

$D_B = C$

D_C

A \ BC	00	01	11	10
0	1		X	
1	1		X	

$D_C = B'C'$



$D_A = A \oplus B$ $\quad D_B = C$ $\quad D_C = B'C'$

Unused state 011

A	B	C
0	1	1
↓	↓	↓
1	1	0

$D_A = A \oplus B$
$= 0 \oplus 1 = 1$
$Q(t+1) = Q(t)'$

$D_B = C = 1$
$Q(t+1) = Q(t)$

$D_C = B'C' = 1'1' = 0$
$Q(t+1) = Q(t)'$

Unused State 111

A	B	C
1	1	1
↓	↓	↓
0	1	0

$D_A = A \oplus B$
$= 1 \oplus 1 = 0$
$Q(t+1) = Q(t)'$

$D_B = C = 1$
$Q(t+1) = Q(t)$

$D_C = B'C'$
$= 1'1' = 0$
$Q(t+1) = Q(t)'$

Since the invalid states transition into valid states, then this circuit is self-correcting