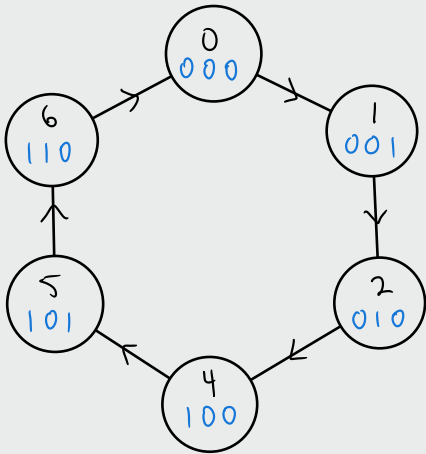


Problem statement: Implement the sequential circuit needed for the following sequence (using T f/f)

0 → 1 → 2 → 4 → 5 → 6 → 0



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

(d) T

T flip flop
Excitation table

	$Q(t)$			$Q(t+1)$					
	A	B	C	A	B	C	T_A	T_B	T_C
0	0	0	0	0	0	1	0	0	1
1	0	0	1	0	1	0	0	1	1
2	0	1	0	1	0	0	1	1	0
4	1	0	0	1	0	1	0	0	1
5	1	0	1	1	1	0	0	1	1
6	1	1	0	0	0	0	1	1	0

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

$$T_A = B$$

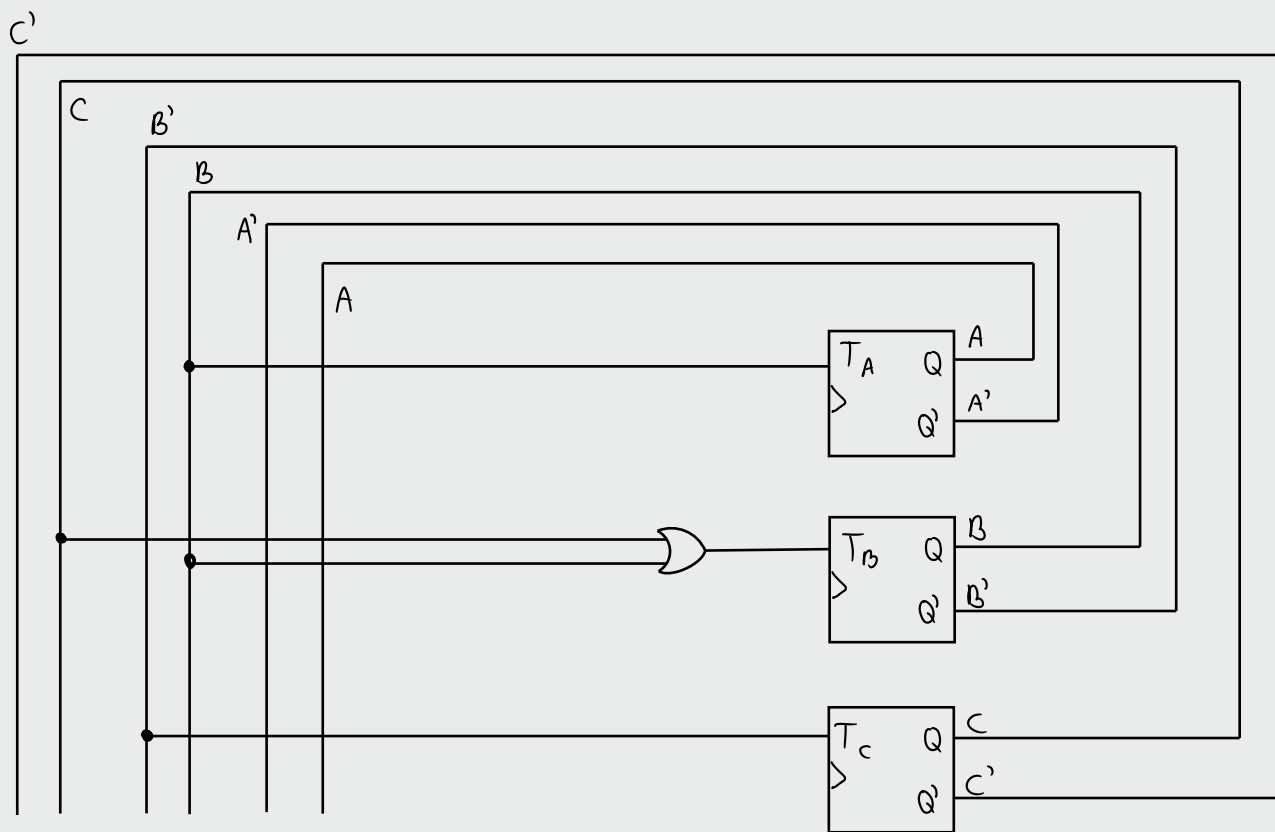
T_B	BC			
	A	00	01	11 10
0			1	X 1
1			1	X 1

$$T_B = B + C$$

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

$$T_C = B'$$

Note: Failure to simplify to the simplest boolean expression can lead to incorrectly determining which states the invalid states transition to, potentially leading to an incorrect conclusion as to whether the circuit is self-correcting or not.



T	$Q(t+1)$
0	$Q(t)$
1	$Q'(t)$

T flip flop
characteristic
table

Unused state 011

A	B	C
0	1	1
↓	↓	↓
1	0	1

$$T_A = B = 1 \Rightarrow \text{toggle}$$

$$T_B = B + C = 1 + 1$$

$$= 1 \Rightarrow \text{toggle}$$

$$T_C = B'$$

$$= 0 \Rightarrow \text{no change}$$

Unused state 111

A	B	C
1	1	1
↓	↓	↓
0	0	1

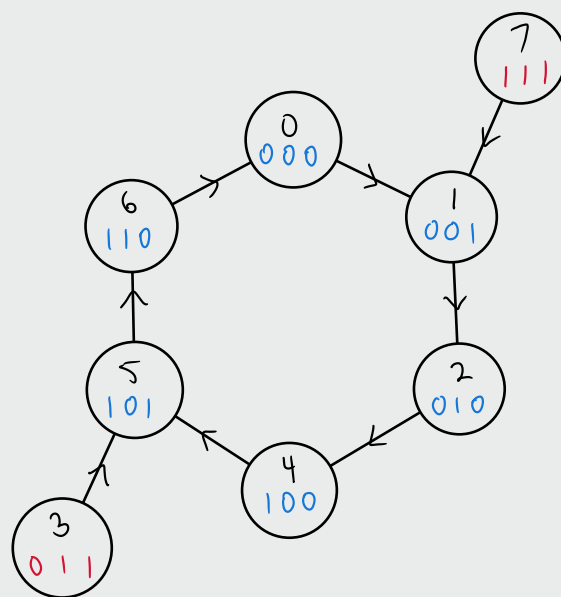
$$T_A = B = 1 \Rightarrow \text{toggle}$$

$$T_B = B + C = 1 + 1$$

$$= 1 \Rightarrow \text{toggle}$$

$$T_C = B'$$

$$= 0 \Rightarrow \text{no change}$$



Since the invalid states
transition to valid states
(011 \rightarrow 100 and 111 \rightarrow 001),
then this circuit is
self correcting