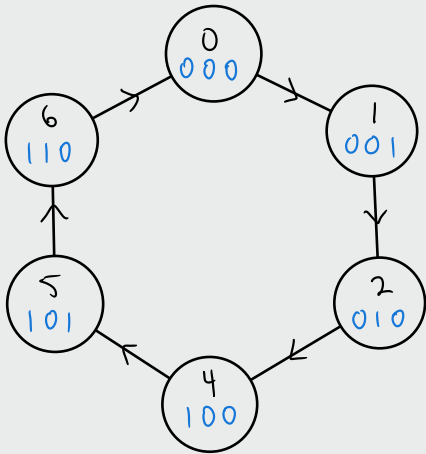


Problem statement: Implement the sequential circuit needed for the following sequence (using T f/f)

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

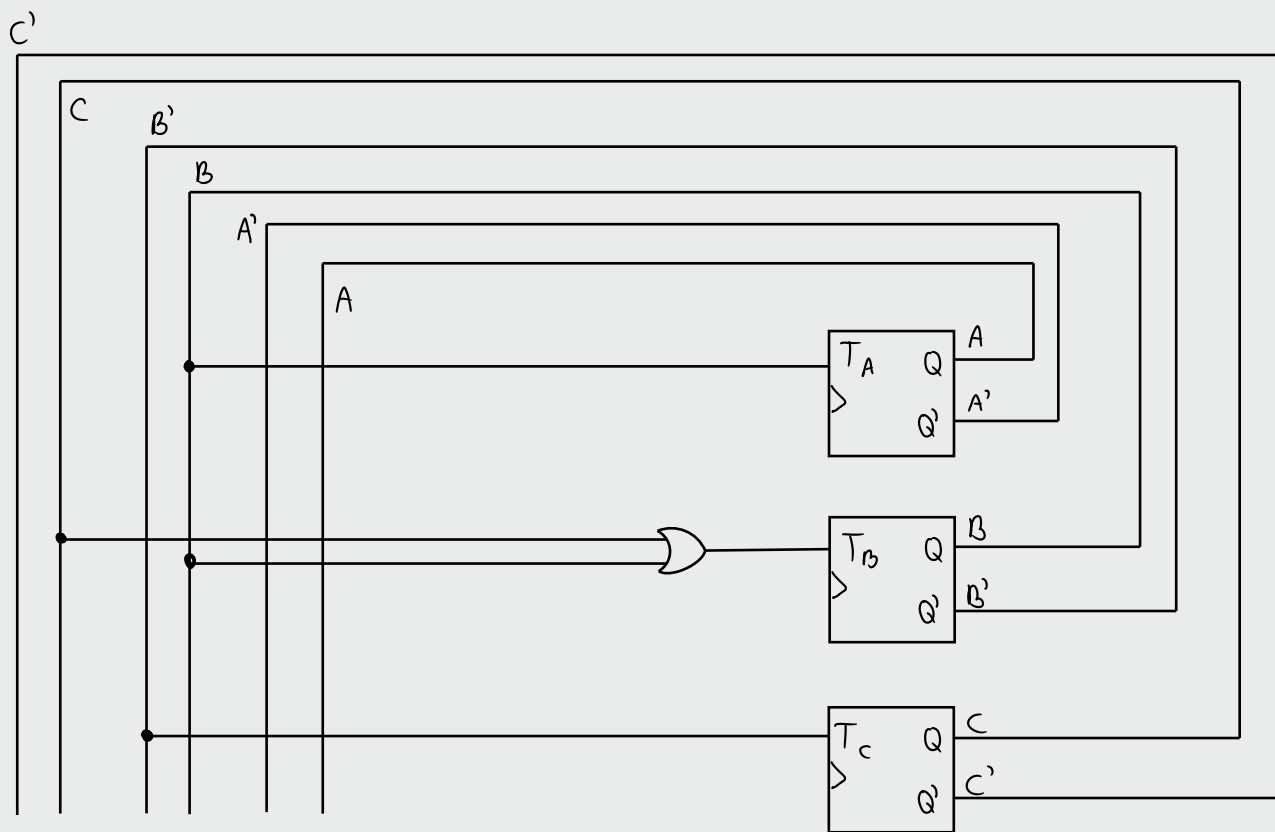
$$T_A = B$$

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

$$T_B = B + C$$

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

$$T_C = B'$$



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

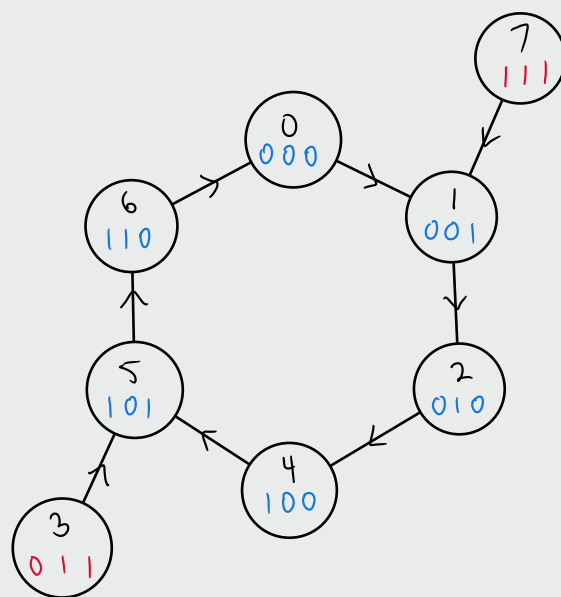
T flip flop
characteristic
table

Unused state 011

A	B	C	
0	1	1	$T_A = B = 1 \Rightarrow \text{toggle}$
\downarrow	\downarrow	\downarrow	$T_B = B + C = 1 + 1$
1	0	1	$= 1 \Rightarrow \text{toggle}$
			$T_C = B'$
			$= 0 \Rightarrow \text{no change}$

Unused state 111

A	B	C	
1	1	1	$T_A = B = 1 \Rightarrow \text{toggle}$
\downarrow	\downarrow	\downarrow	$T_B = B + C = 1 + 1$
0	0	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