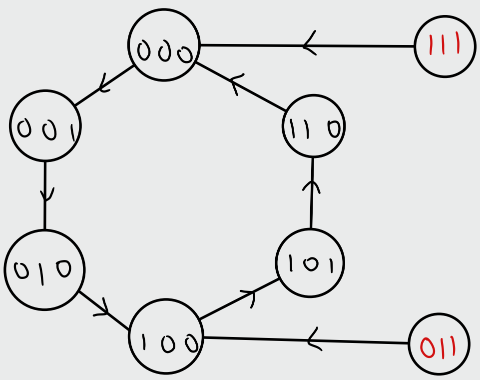
Counter for a non-binary sequence (ie. with skipped states)

Create a state table for the below sequence:

$0 \rightarrow 1 \rightarrow 2 \rightarrow 4 \rightarrow 5 \rightarrow 6$

We see that 3 and 7 (011 and 111) are missing, so when we draw the state diagram, we include them but without transitions to them



$Q(t)$	$Q(t+1)$	J	K
0	0	0	X
0	1	1	X
1	0	X	1
1	1	X	0

(b) JK

JK excitation table from Morris Mano 6.6

	Q(t) A	Q(t) B	Q(t) C	Q(t+1) A	Q(t+1) B	Q(t+1) C	J_A	K_A	J_B	K_B	J_C	K_C
0	0	0	0	0	0	1	0	X	0	X	1	X
1	0	0	1	0	1	0	0	X	1	X	X	1
2	0	1	0	1	0	0	1	X	X	1	0	X
4	1	0	0	1	0	1	X	0	0	X	1	X
5	1	0	1	1	1	0	X	0	1	X	X	1
6	1	1	0	0	0	0	X	1	X	1	0	X

J_A

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

$J_A = B$

J_B

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

$J_B = C$

J_C

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

$J_C = B'$

K_A

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

$K_A = B$

K_B

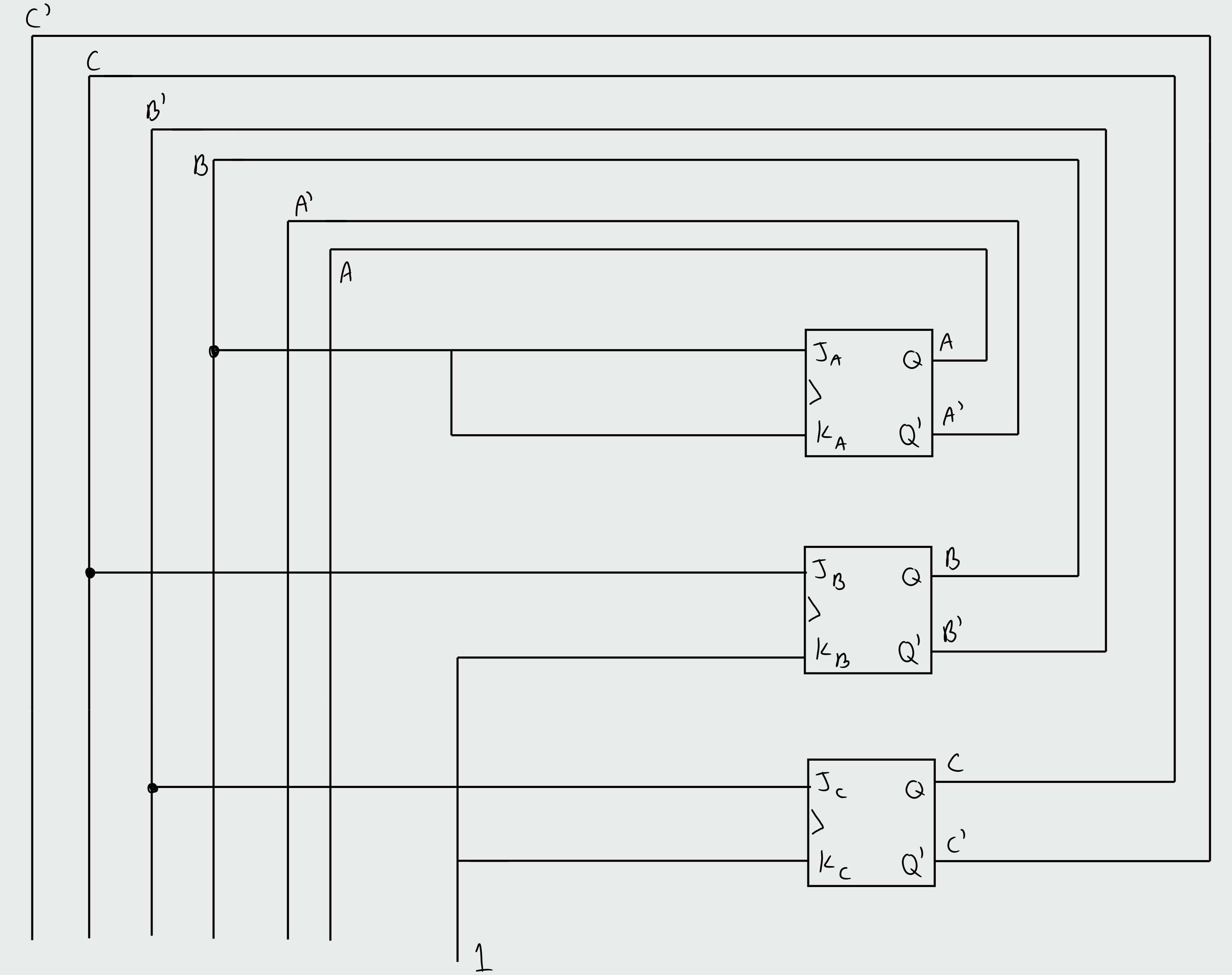
A \ BC	00	01	11	10
0	X	X	X	1
1	X	X	X	1

$K_B = 1$

K_C

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

$K_C = 1$



We then determine how this self corrects for the unused states

A	B	C
0	1	1
↓	↓	↓
1	0	0

$\left.\begin{array}{l} J_A = 1 \\ K_A = 1 \end{array}\right] Q(t+1) = Q(t)'$

$\left.\begin{array}{l} J_B = 1 \\ K_B = 1 \end{array}\right] Q(t+1) = Q(t)'$

$\left.\begin{array}{l} J_C = 0 \\ K_C = 1 \end{array}\right] Q(t+1) = 0$

A	B	C	
1	1	1	
↓	↓	↓	
0	0	0	(reset)

* explain in exam: set, reset, or complement