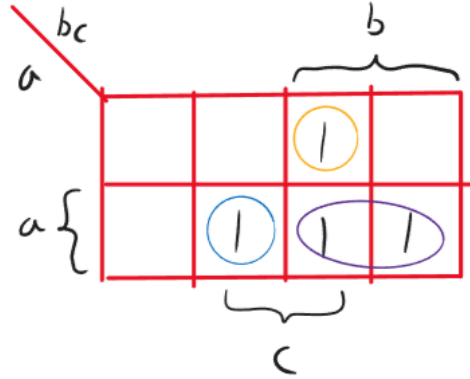


1) Truth Table

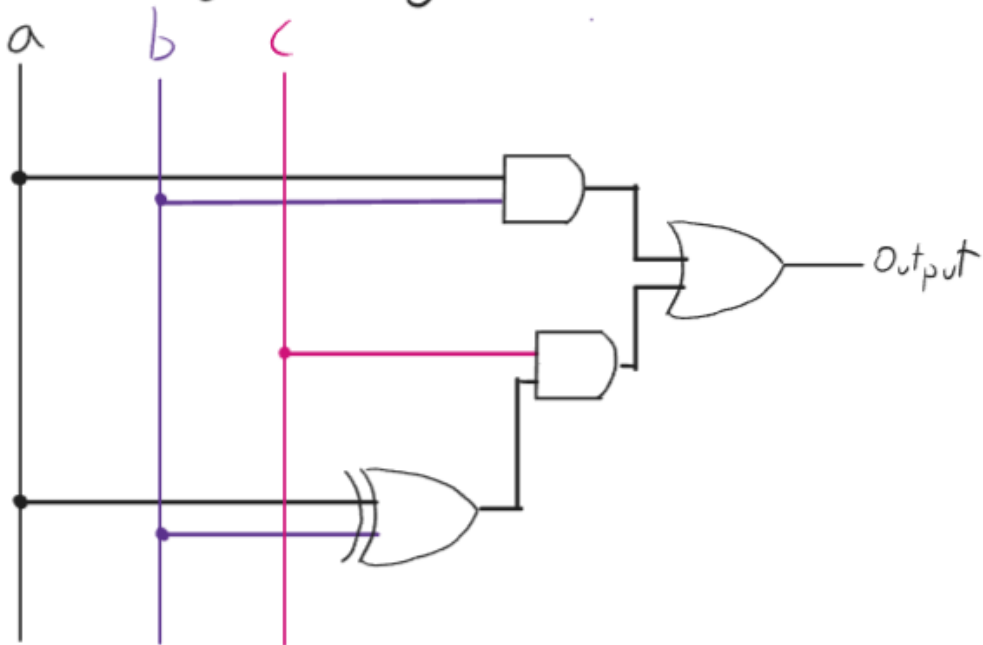
a	b	c	Output
0	0	0	0
0	0	1	0
0	1	0	0
0	1	1	1
1	0	0	0
1	0	1	1
1	1	0	1
1	1	1	1

## k-map

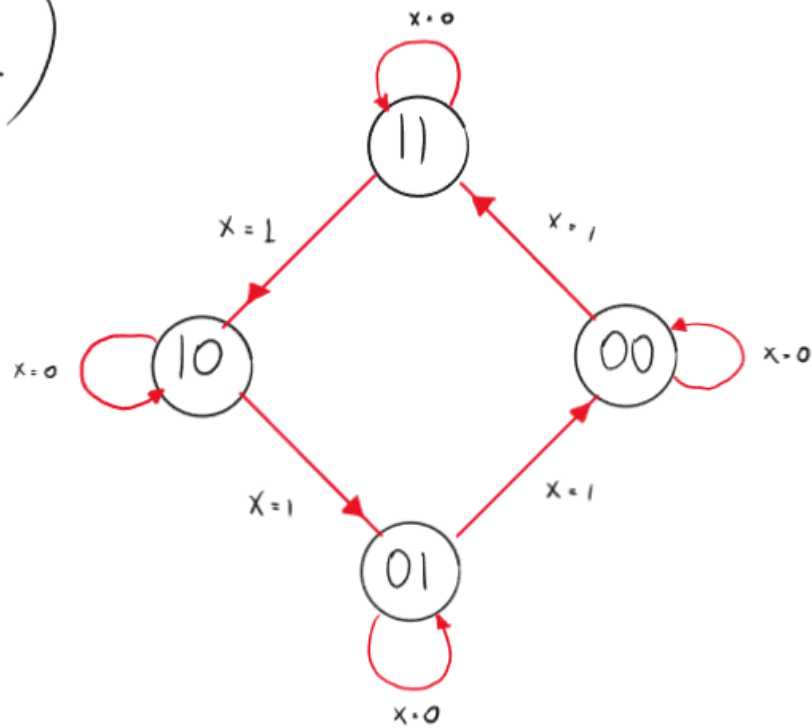


$$\begin{aligned}\text{Output} &= ab + ac + bc \\ &= ab + (a'b + ab')c \\ &= ab + (a \oplus b)c\end{aligned}$$

## Logic Diagram



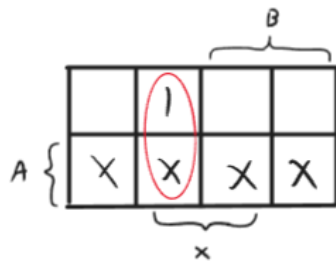
2)



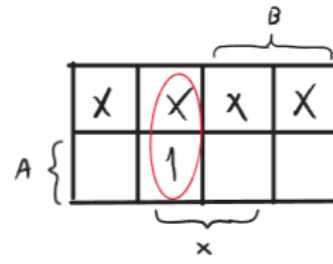
Excitation Table For Binary Counter

Present Stage		Input	Next Stage		Flip-Flop inputs			
A	B	X	A	B	$J_A$	$K_A$	$J_B$	$K_B$
1	1	0	1	1	X	0	X	0
1	1	1	1	0	X	0	X	1
1	0	0	1	0	X	0	0	X
1	0	1	0	1	X	1	1	X
0	1	0	0	1	0	X	X	0
0	1	1	0	0	0	X	X	1
0	0	0	0	0	0	X	0	X
0	0	1	1	1	1	X	1	X

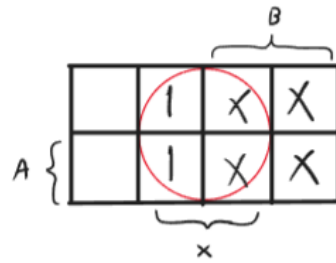
## Map for Combinatorial Circuit of Counter



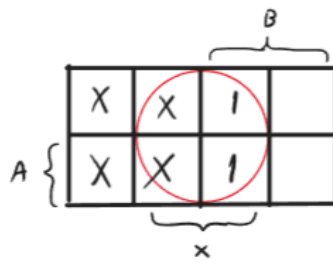
$$J_A = B'x$$



$$K_A = B'x$$



$$J_B = x$$



$$K_B = x$$

## Logic Diagram of a 2-Bit Binary Counter

