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Ans 1 State Transition Table →

Current State (S)	A_i	B_i	C_{in}	Next State (S')	Output Y (sum)
0	0	0	0	0	0
0	0	1	0	0	1
0	1	0	0	0	1
0	1	1	0	1	0
1	0	1	1	1	0
1	1	0	1	1	0
1	1	1	1	1	1
1	0	0	1	0	1

State Encoding

State	$S_{0:0}$
S0	0
S1	1

$\Rightarrow S_0' = A_i B_i + A_i S_0 + B_i S_0$ *

$\Rightarrow S_0 = C_{in}$

$\Rightarrow S_0' = C_{out}$

(or) $S_0' = A_i B_i + B_i C_i + A_i C_i = C_{out}$

$\Rightarrow Y_{sum} = A_i \oplus B_i \oplus C_i$

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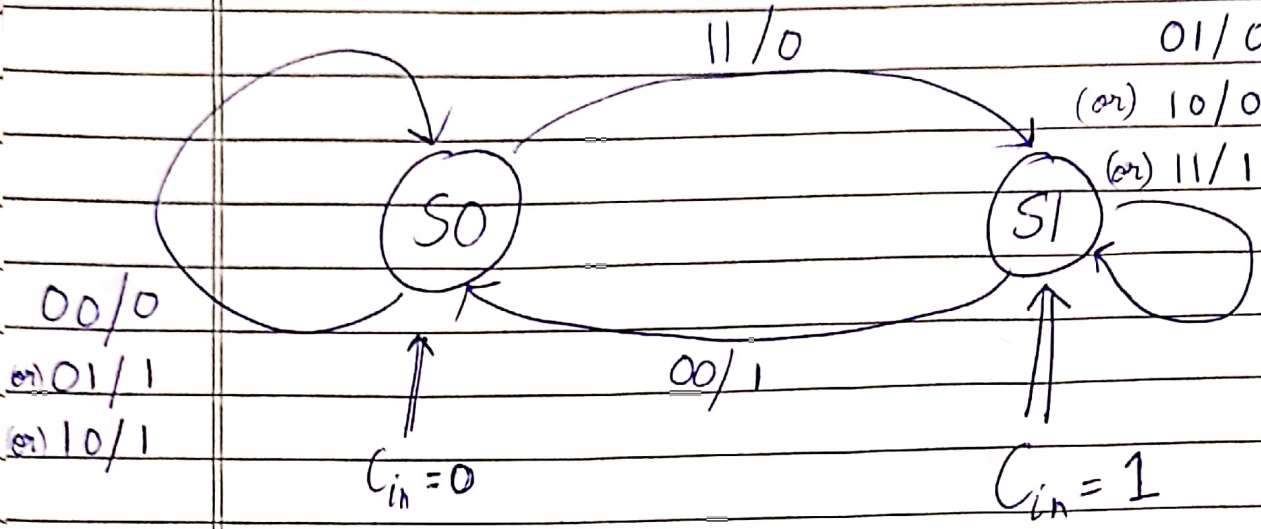
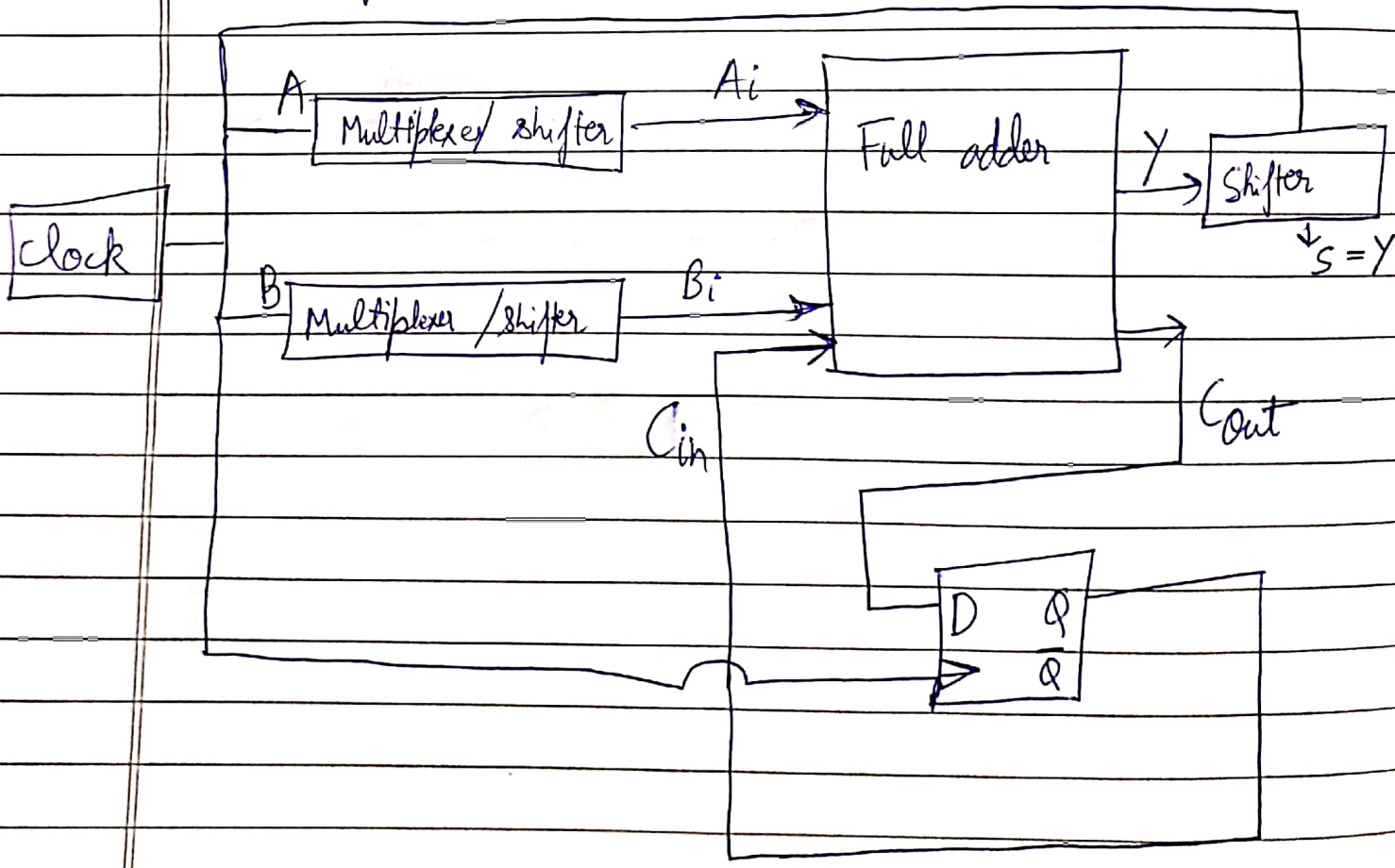
State Diagram $(A_i B_i / Y_{Sum})$



Note correct answer appears when counter returns to zero after a complete ~~cycles~~ cycle of counter.



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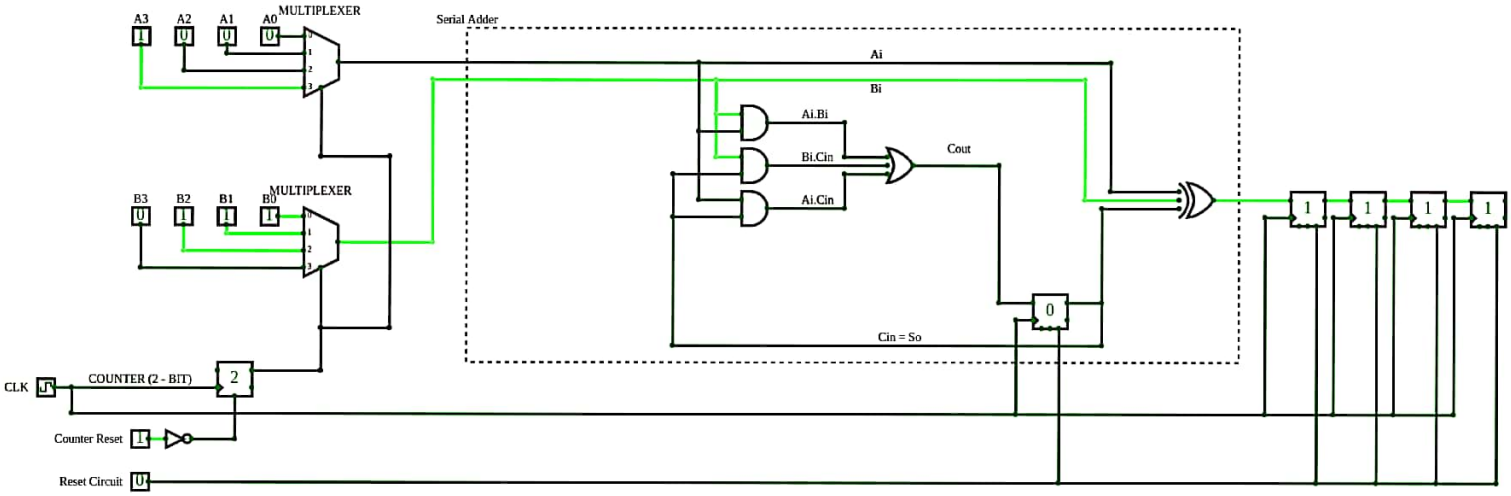

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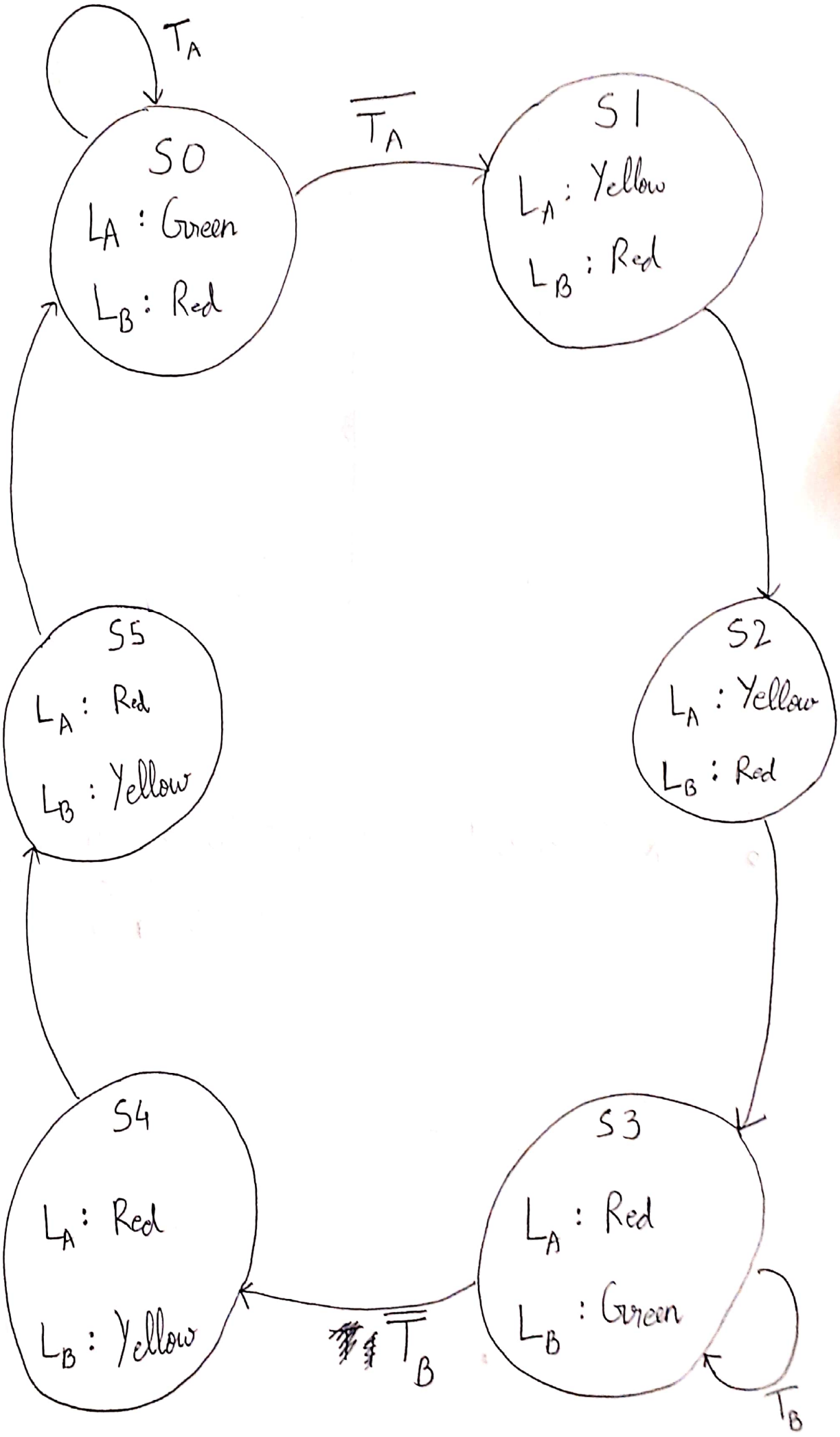
Ans 2



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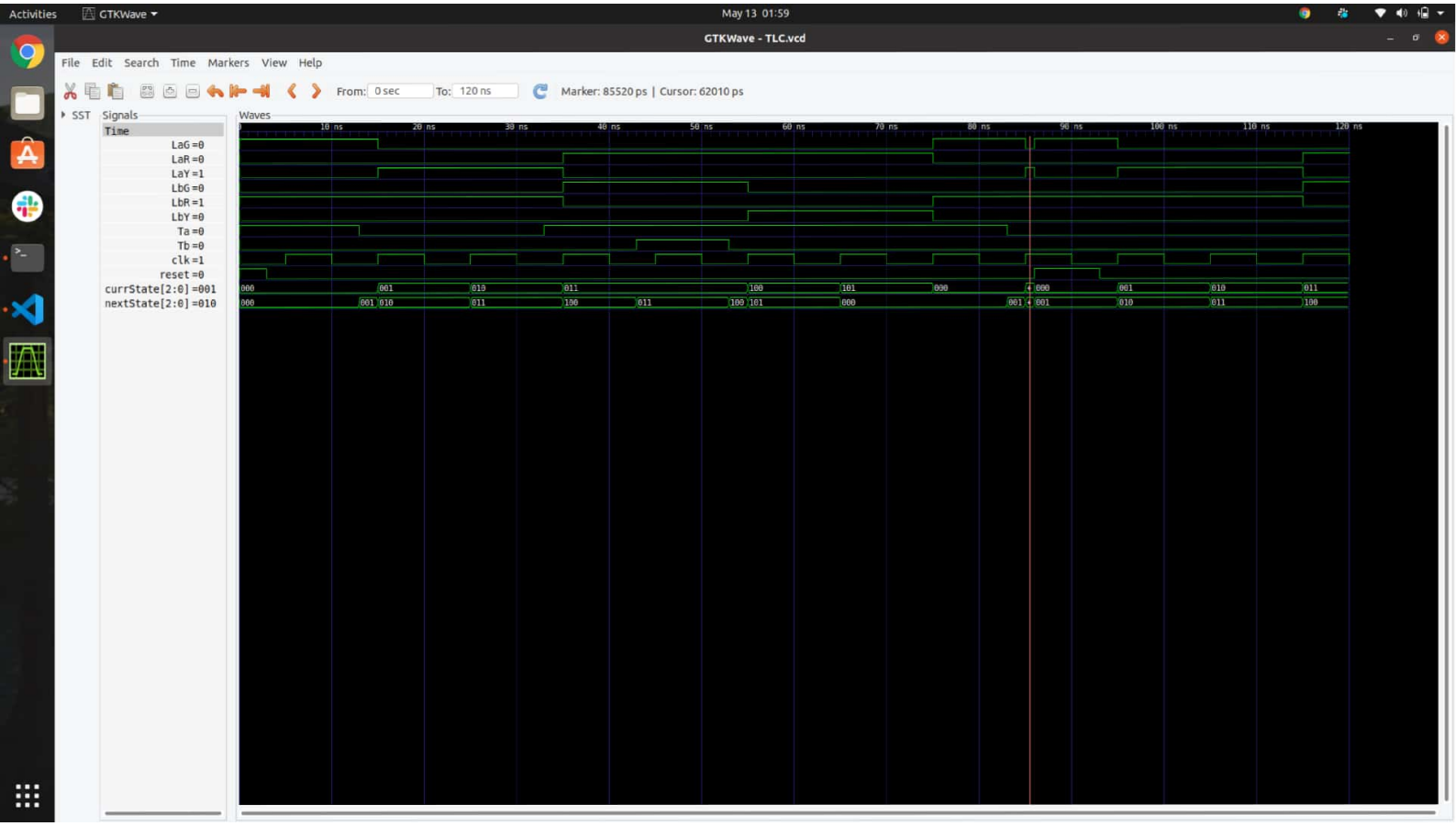

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