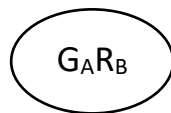Analysis of the system

❖ **Initial state**

$G_A R_B$

Since this state is not an amber state
timer_done = 1 and amber_timer_en = 0

Output = 0001100

When

timer_done	Traffic_B	Result
0	0	x
0	1	x
1	0	Same state
1	1	$A_A R_B$

Since, timer_done = 0 can't
occur in this state

❖ **Second State**

$A_A R_B$

Since this state is an amber state
timer_done = 0 and amber_timer_en = 1

Output = 1001010

When before k amount of time

timer_done	Traffic_B	Result
0	x	Same state

after k amount of time,

timer_done	Traffic_B	Result
1	x	$R_A G_B$

Since, traffic_B signal does not have
any effect when amber light on.

❖ **Third State**

$R_A G_B$

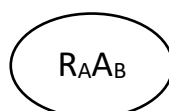Since this state is not an amber state
timer_done = 1 and amber_timer_en = 0

Output = 0100001

When

timer_done	Traffic_B	Result
	0	
	1	
1	0	$R_A A_B$
1	1	Same state

Since, timer_done = 0 can't
occur in this state

❖ **Fourth State**

$R_A A_B$

Since this state is an amber state
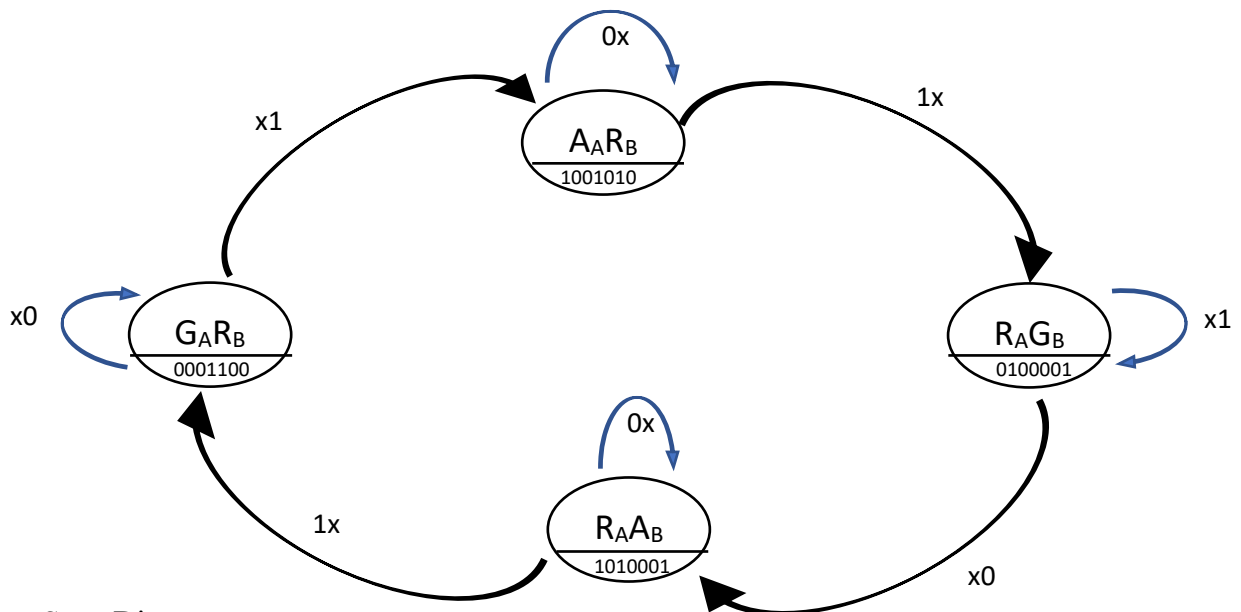timer_done = 0 and amber_timer_en = 1

Output = 1010001

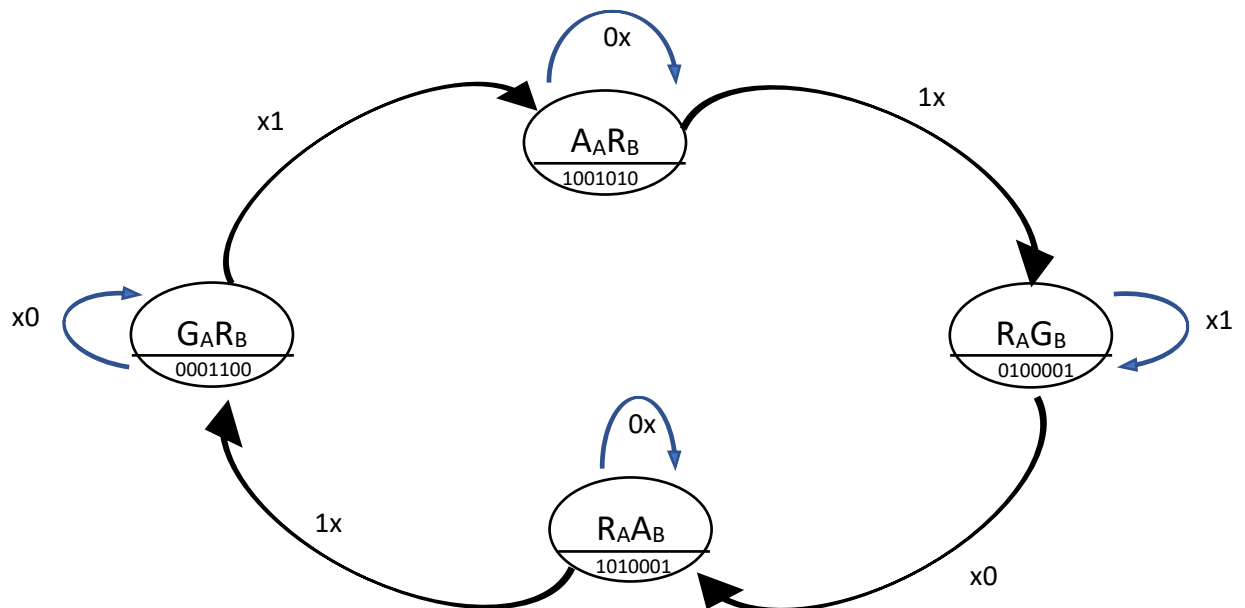before k amount of time

timer_done	Traffic_B	Result
0	x	Same state

after k amount of time,

timer_done	Traffic_B	Result
1	x	$G_A R_B$

Since, traffic_B signal does not have any effect when amber light on.

State Diagram

State transition table

Current State	Next State				Output
	timer_done(1)	timer_done(0)	traffic_B(1)	traffic_B(0)	
00	x	x	01	00	0001100
01	10	01	x	x	1001010
10	x	x	10	11	0100001
11	00	11	x	x	1010001