2020-2021 Spring Semester

Lab-4 Preliminary Report

Course Name:CS223

Section: 1

Lab: 4

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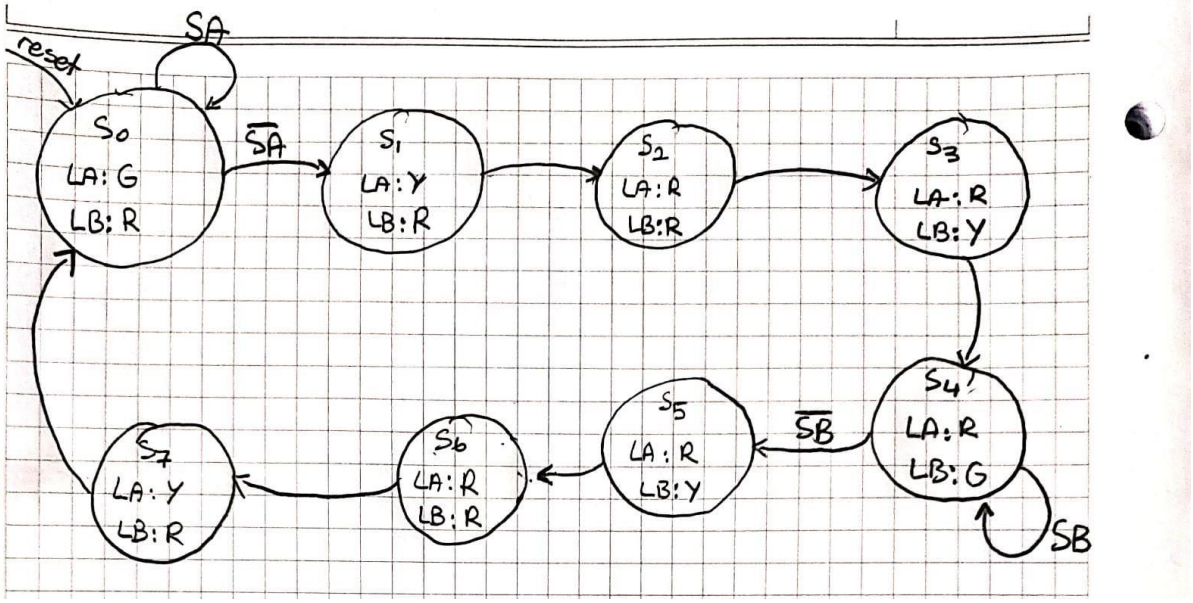
Trainer Pack: 19

1.1) Moore Finite State Machine Transition Diagram



1.2) State Encodings

State variables: S_2, S_1, S_0

	S_2	S_1	S_0
S_0	0	0	0
S_1	0	0	1
S_2	0	1	0
S_3	0	1	1
S_4	1	0	0
S_5	1	0	1
S_6	1	1	0
S_7	1	1	1

1.3) State Transition Table

S_2	S_1	S_0	SA	SB	S_2'	S_1'	S_0'
0	0	0	1	X	0	0	0
0	0	0	0	X	0	0	1
0	0	1	X	X	0	1	0
0	1	0	X	X	0	1	1
0	1	1	X	X	1	0	0
1	0	0	X	1	1	0	0
1	0	0	X	0	1	0	1
1	0	1	X	X	1	1	0
1	1	0	X	X	1	1	1
1	1	1	X	X	0	0	0

1.4) Output Table

S_2	S_1	S_0	LAR	LAY	LAG	LBR	LBY	LBG
0	0	0	1	1	1	1	0	0
0	0	1	1	1	0	1	0	0
0	1	0	1	0	0	1	0	0
0	1	1	1	0	0	1	1	0
1	0	0	1	0	0	1	1	1
1	0	1	1	0	0	1	1	0
1	1	0	1	0	0	1	0	0
1	1	1	1	1	0	1	0	0

1.5) Next State & Output Equations

$$S_2' = S_2\bar{S}_1 + S_2\bar{S}_0 + \bar{S}_2 S_1 S_0$$

$$S_1' = \bar{S}_1 S_0 + S_1\bar{S}_0$$

$$S_0' = S_1\bar{S}_0 + \bar{S}_2\bar{S}_0 SA + \bar{S}_2\bar{S}_0\bar{SB}$$

$$LAR = 1$$

$$LAY = \bar{S}_2\bar{S}_1 + S_2 S_1 S_0$$

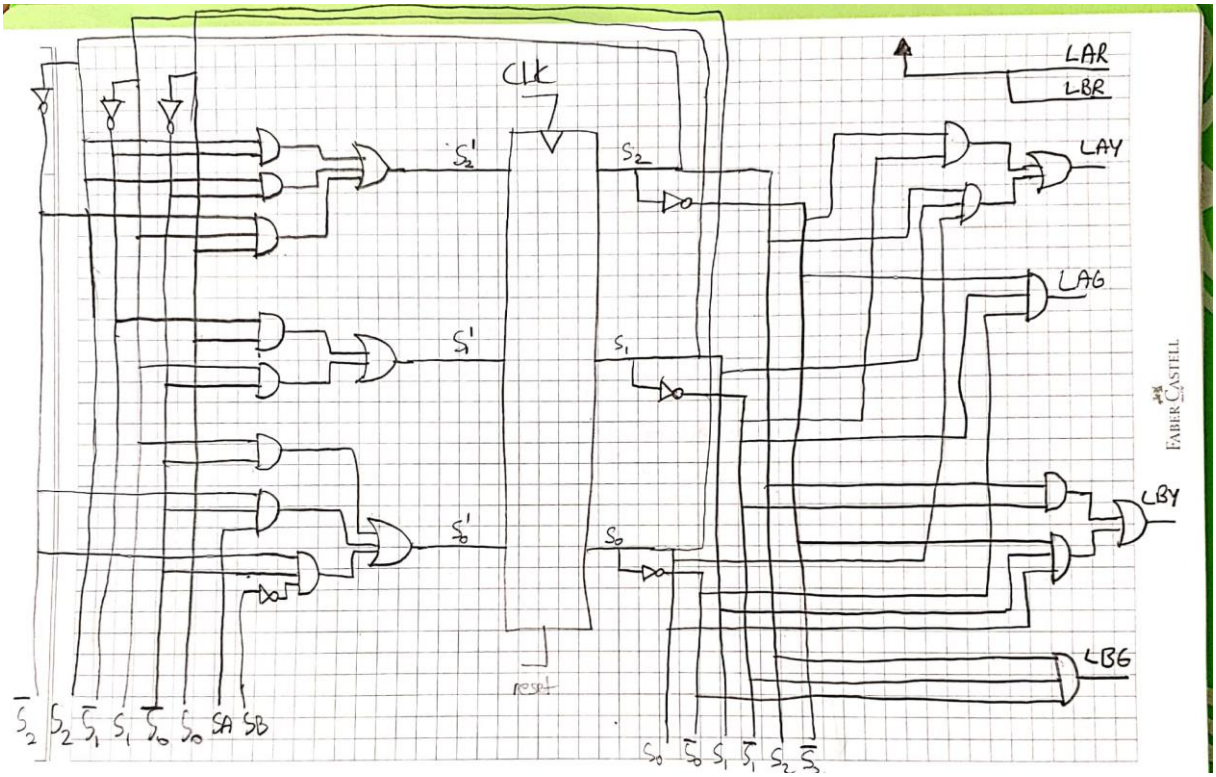
$$LAG = \bar{S}_2\bar{S}_1\bar{S}_0$$

$$LBR = 1$$

$$LBY = S_2\bar{S}_1 + \bar{S}_2 S_1 S_0$$

$$LBG = S_2\bar{S}_1\bar{S}_0$$

1.6) FSM Circuit Schematic



2) We need 3 flip-flops to implement this problem because we have 3 state variables.

3)