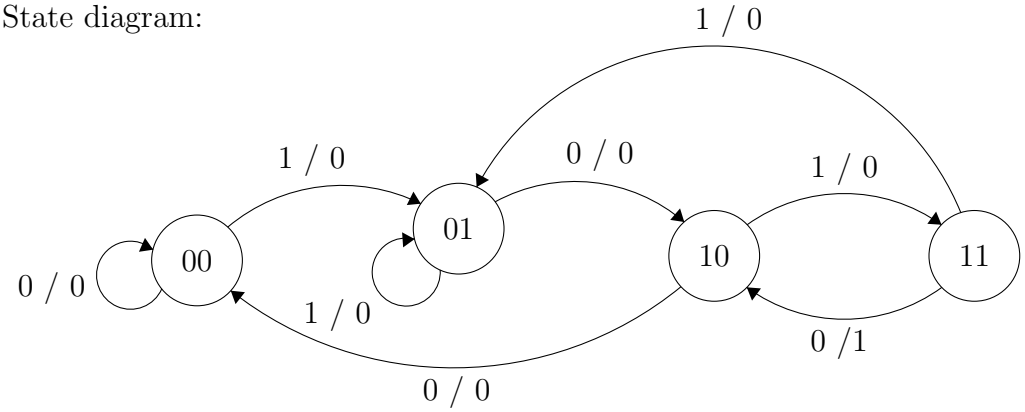
CS 220A — Computer Organization

Group No: 33 **Due Date:** February 17 2022, 23:59
Roll Number: 190616, 190714, 190773 **Assignment Number:** 3

Q1. Sequence Detector:

(a) State diagram:



Excitation table:

PS (AB)	in	NS (AB)
00	0	00
00	1	01
01	0	10
01	1	01
10	0	00
10	1	11
11	0	10
11	1	01

Transition and output table:

PS (AB)	NS (AB), O/P	
	in	in
	0	1
00	(00, 0)	(01, 0)
01	(10, 0)	(01, 0)
10	(00, 0)	(11, 0)
11	(10, 1)	(01, 0)

(b) K-map for A(t+1):

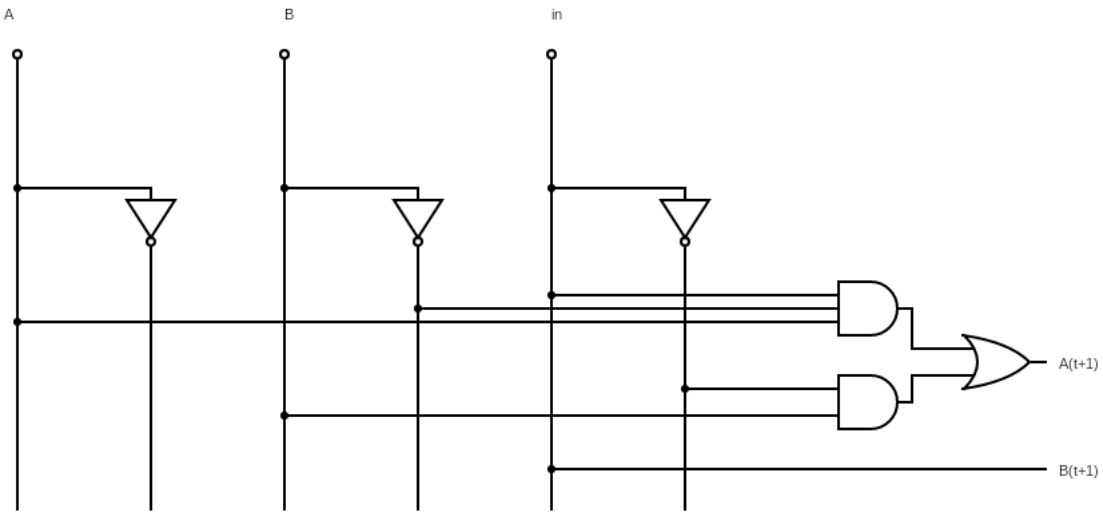
in \ A,B	00	01	11	10
0	0	1	1	0
1	0	0	0	1

$$A(t+1) = \bar{in}B \ + \ inA\bar{B}$$

K-map for B(t+1):

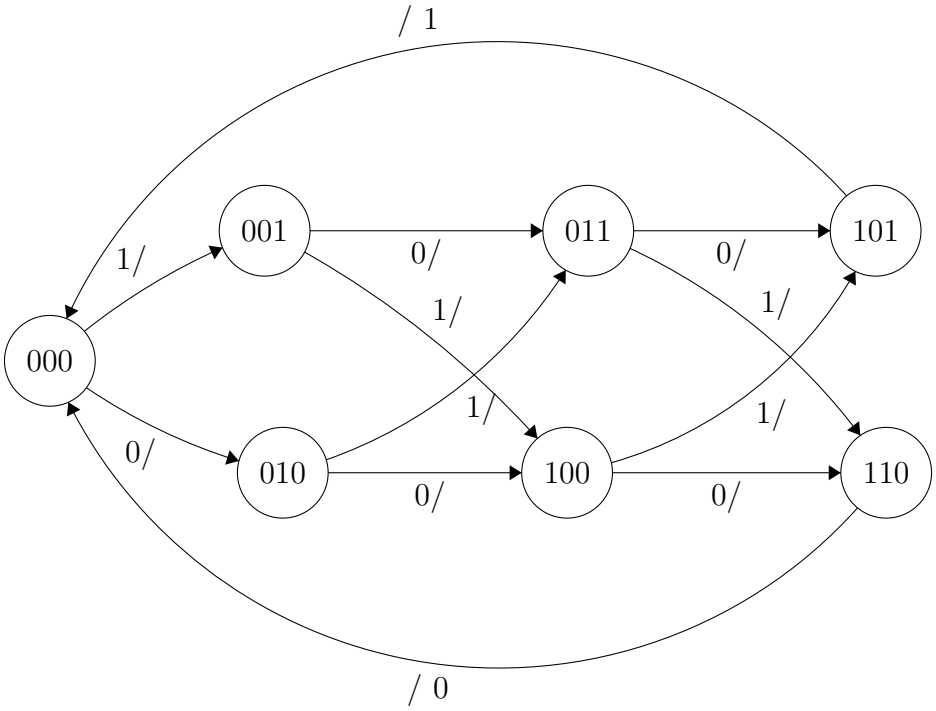
in \ A,B	00	01	11	10
0	0	0	0	0
1	1	1	1	1

$$B(t+1) = in$$



Q2. 3-bit odd parity generator:

(a) State diagram:



Excitation table:

PS (ABC)	in	NS (ABC)
000	0	010
000	1	001
001	0	011
001	1	100
010	0	100
010	1	011
011	0	101
011	1	110
100	0	110
100	1	101
101	x	000
110	x	000

Transition and output table:

PS (ABC)	NS (ABC), O/P	
	in	in
	0	1
000	(010,)	(001,)
001	(011,)	(100,)
010	(100,)	(011,)
011	(101,)	(110,)
100	(110,)	(101,)
101	(000, 1)	(000, 1)
110	(000, 0)	(000, 0)

(b) K-map for A(t+1):

in, A \ B, C	00	01	11	10
00	0	0	1	1
01	1	0	0	0
11	1	0	0	0
10	0	1	1	0

$$A(t+1) = in\bar{A}C \ + \ \bar{in}\bar{A}B \ + \ A\bar{B}\bar{C}$$

K-map for B(t+1):

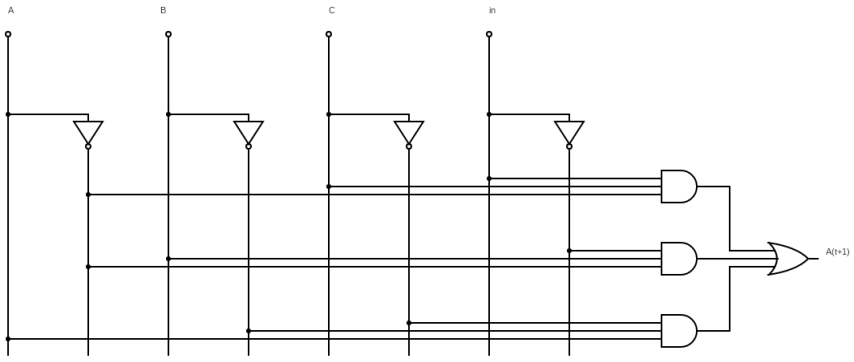
in, A \ B, C	00	01	11	10
00	1	1	0	0
01	1	0	0	0
11	0	0	0	0
10	0	0	1	1

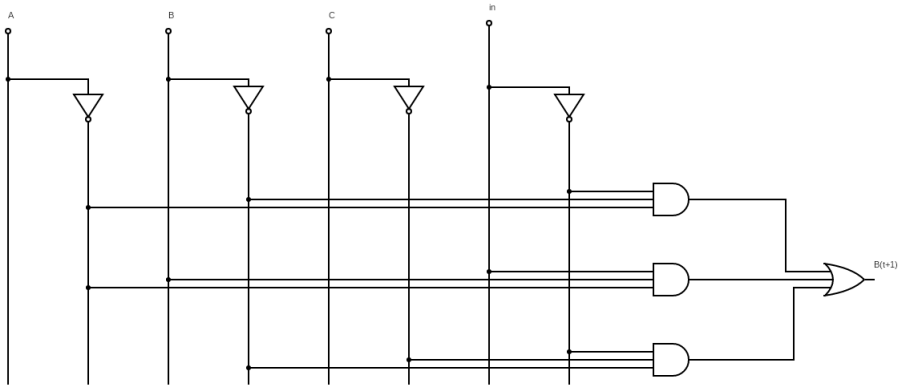
$$B(t+1) = \bar{in}\bar{A}\bar{B} \ + \ in\bar{A}B \ + \ \bar{in}\bar{B}\bar{C}$$

K-map for C(t+1):

in, A \ B, C	00	01	11	10
00	0	1	1	0
01	0	0	0	0
11	1	0	0	0
10	1	0	0	1

$$C(t+1) = in\bar{A}\bar{C} \ + \ \bar{in}\bar{A}C \ + \ in\bar{B}\bar{C}$$





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