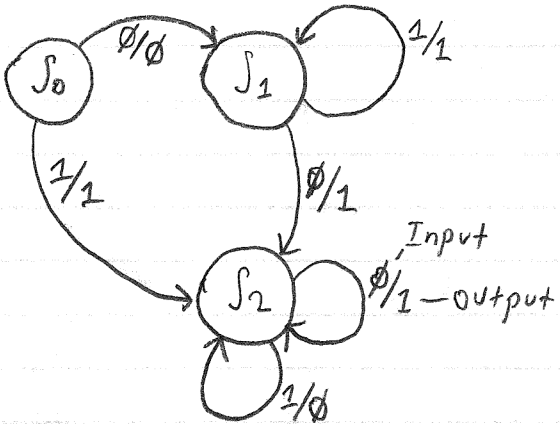
Christopher Bero

HW 02

CPE322

P1



Sample Input: Ø, 1, Ø, Ø, 1, RESET, 1, Ø, 1 (LSB)

P2

Present State	Next State X=Ø	Next State X=1	Present Output X=Ø	Present Output X=1
S_0	S_1	S_2	Ø	1
S_1	S_2	S_1	1	1
S_2	S_2	S_2	1	Ø

Define A, B as Dflip flops:

	A	B	A^+ X=0	A^+ X=1	B^+ X=0	B^+ X=1	Z X=0	Z X=1
S_0	Ø	Ø	Ø	1	1	Ø	Ø	1
S_1	Ø	1	1	Ø	Ø	1	1	1
S_2	1	Ø	1	Ø	1	Ø	1	Ø

K-maps for output Z:

X\AB	ØØ	Ø1	11	1Ø
Ø	Ø	1	X	1
1	1	1	X	Ø

$Z = XA' + B + X'A$

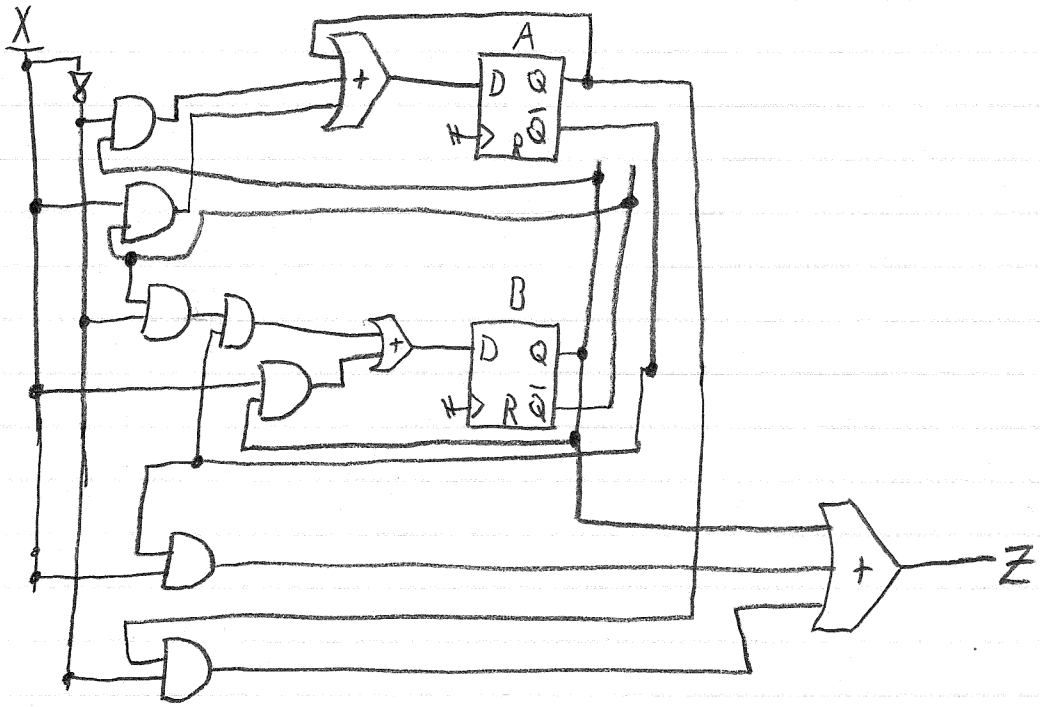
X\AB	ØØ	Ø1	11	1Ø
Ø	1	Ø	X	Ø
1	Ø	1	X	Ø

$B^+ = X'A'B' + XB$

X\AB	ØØ	Ø1	11	1Ø
Ø	0	1	X	1
1	1	0	X	1

$A^+ = A + X'B + XB'$

P2

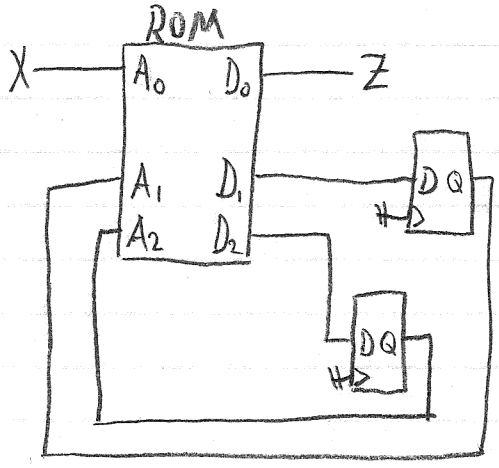


Input: 0, 1, 0, 0, 1 Output: 0, 1, 1, 1, 0

Input: 1, 0, 1 Output: 1, 1, 0

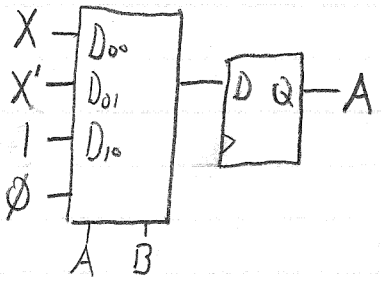
P3

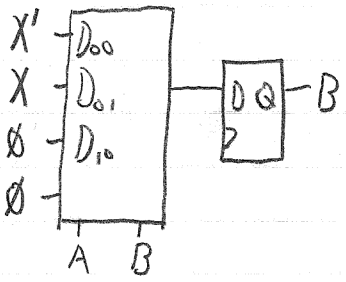
A	B	X	A^+	B^+	Z
0	0	0	0	1	0
0	0	1	1	0	1
0	1	0	1	0	1
0	1	1	0	1	1
1	0	0	1	0	1
1	0	1	1	0	0
A_2	A_1	A_0	D_2	D_1	D_0

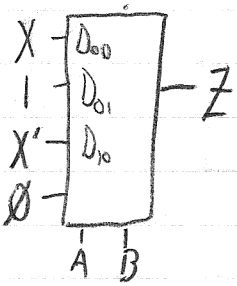


P4

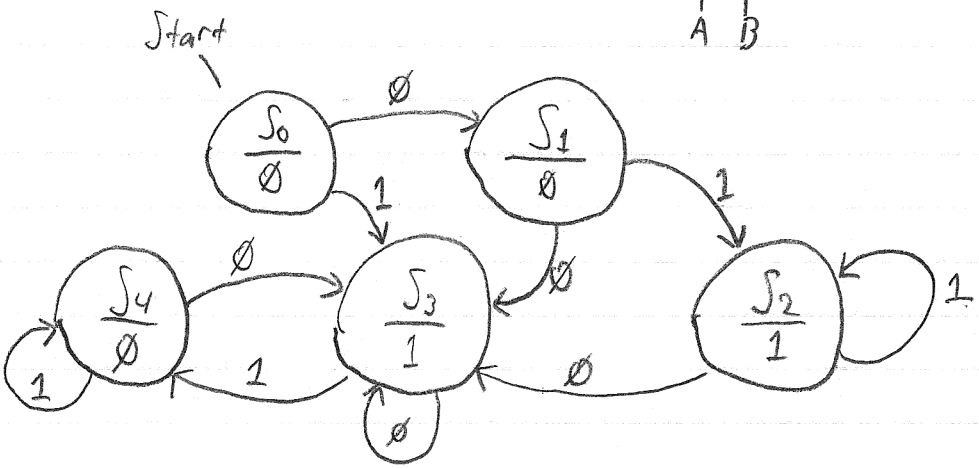
A	B	X	A^+	B^+	Z
0	0	0	[X]	[X']	[X]
0	0	1			
0	1	0	[X']	[X]	[A']
0	1	1			
1	0	0	[A]	[A]	[X']
1	0	1			
1	1	0			
1	1	1			







P5



Sample Input: Ø, 1, 1, Ø, Ø, 1, 1, Ø, RESET, 1

P6

Present State	Next State X=0	Next State X=1	Present Output (Z)
S_0	S_1	S_3	Ø
S_1	S_3	S_2	Ø
S_2	S_3	S_2	1
S_3	S_3	S_4	1
S_4	S_3	S_4	Ø

Define D FFs A, B, C:

	A	B	C	$A^+B^+C^+$ X=0	$A^+B^+C^+$ X=1	Z
S_0	0	0	0	001	011	0
S_1	0	0	1	011	001	0
S_2	0	1	0	011	001	1
S_3	0	1	1	011	100	1
S_4	1	0	0	011	100	0

BC \ AX	00	01	11	10
00	0	0	1	0
01	0	0	X	X
11	1	0	X	X
10	0	0	X	X

$A^+ = BCX + AX$

BC \ AX	00	01	11	10
00	0	1	0	1
01	1	0	X	X
11	1	0	X	X
10	1	0	X	X

$B^+ = A'B'C'X + AX' + CX' + BX'$

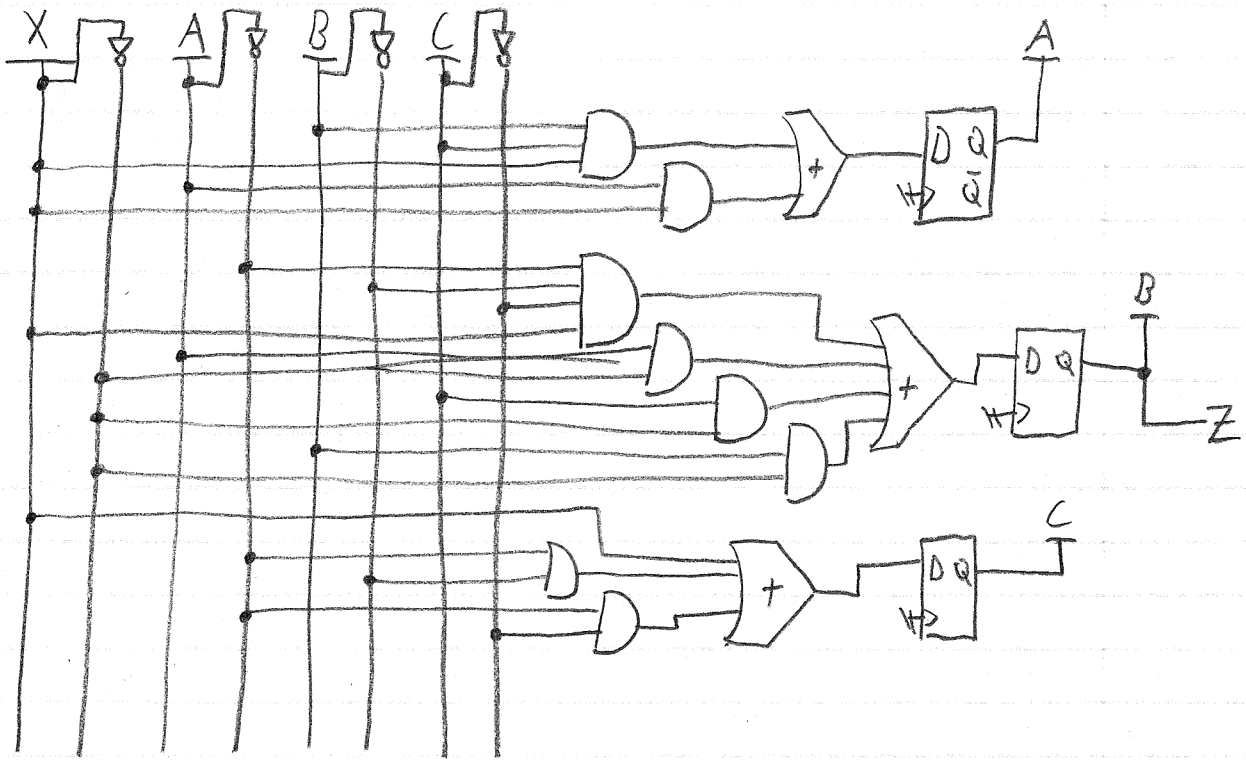
BC \ AX	00	01	11	10
00	1	1	1	0
01	1	1	X	X
11	0	1	X	X
10	1	1	X	X

$C^+ = X + A'B' + A'C'$

BC \ A	0	1
00	0	0
01	0	X
11	1	X
10	1	X

$Z = B$

P6



Input : 0, 1, 1, 0, 0, 1, 1, 0, Output : 1, 1, 0, 1, 1, 0, 0, 1

Input : 1 Output : 1

P7

A	B	C	D	E	X=0	X=1	Z
1	0	0	0	0	B	D	0
0	1	0	0	0	D	C	0
0	0	1	0	0	D	C	1
0	0	0	1	0	D	E	1
0	0	0	0	1	D	E	0

P7 A B C D E