

1

A	B	C	D	a	b	c	d	e	f	g
0	0	0	0	X	X	X	X	X	X	X
0	0	0	1	0	1	1	0	0	0	0
0	0	1	0	X	X	X	X	X	X	X
0	0	1	1	1	1	1	1	0	0	1
0	1	0	0	X	X	X	X	X	X	X
0	1	0	1	1	0	1	1	0	1	1
0	1	1	0	X	X	X	X	X	X	X
0	1	1	1	1	1	1	0	0	0	0
1	0	0	0	X	X	X	X	X	X	X
1	0	0	1	1	1	1	1	0	1	1
1	0	1	0	X	X	X	X	X	X	X
1	0	1	1	X	X	X	X	X	X	X
1	1	0	0	X	X	X	X	X	X	X
1	1	0	1	X	X	X	X	X	X	X
1	1	1	0	X	X	X	X	X	X	X
1	1	1	1	X	X	X	X	X	X	X

Even numbers and numbers that bigger than 9 are don't care cases.

Canonical Forms

$$a = A'B'CD + A'BC'D + A'BCD + AB'C'D$$

$$b = A'B'C'D + A'B'CD + A'BCD + AB'C'D$$

$$c = 1$$

$$d = A'B'CD + A'BC'D + AB'C'D$$

$$e = 0$$

$$f = A'BC'D + AB'C'D$$

$$g = A'B'CD + A'BC'D + AB'C'D$$

K-Maps

a:

CD	00	01	11	10
AB				
00	X	0	1	X
01	X	1	1	X
11	X	X	X	X
10	X	1	X	X

$$F(ABCD) = A + B + C$$

b:

CD	00	01	11	10
AB				
00	X	1	1	X
01	X	0	1	X
11	X	X	X	X
10	X	1	X	X

$$F(ABCD) = A'B' + C + A$$

c:

CD	00	01	11	10
AB				
00	X	1	1	X
01	X	1	1	X
11	X	X	X	X
10	X	1	X	X

$$F(ABCD) = 1$$

d:

CD	00	01	11	10
AB				
00	X	0	1	X
01	X	1	0	X
11	X	X	X	X
10	X	1	X	X

$$F(ABCD) = A + A'BC' + A'B'C$$

e:

CD	00	01	11	10
AB				
00	X	0	0	X
01	X	0	0	X
11	X	X	X	X
10	X	0	X	X

$$F(A, B, C, D) = 0$$

f:

CD	00	01	11	10
AB				
00	X	0	0	X
01	X	1	0	X
11	X	X	X	X
10	X	1	X	X

$$F(A, B, C, D) = A + A'BC'$$

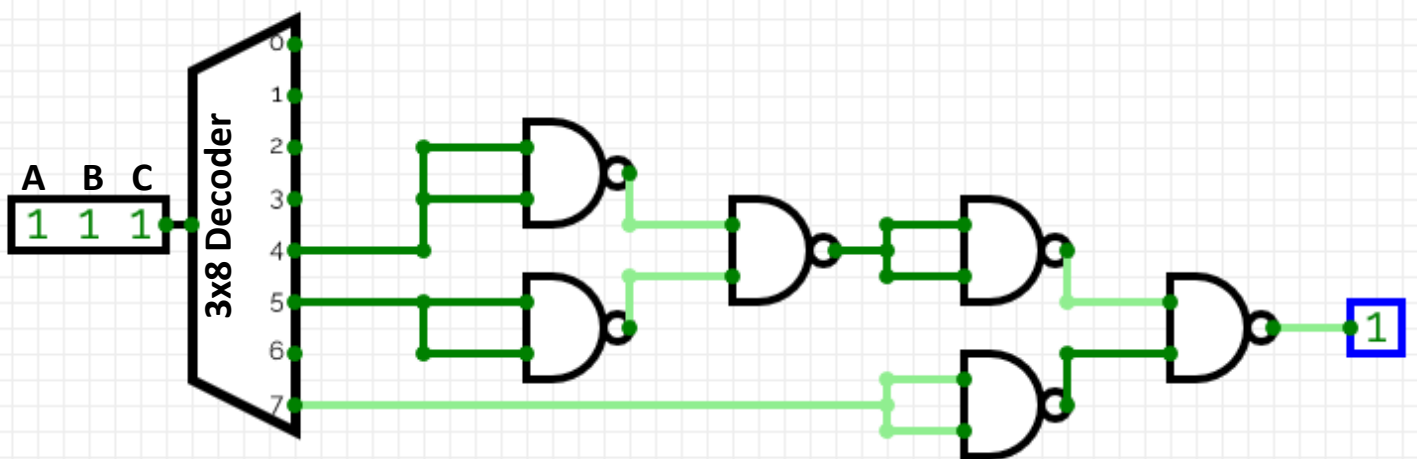
g:

CD	00	01	11	10
AB				
00	X	0	1	X
01	X	1	0	X
11	X	X	X	X
10	X	1	X	X

$$F(A, B, C, D) = A + A'BC' + A'B'C$$

(A)

$$\begin{aligned}
 F(A, B, C) &= AB'C + AB' + AC = AB'C + AB'(C+C') + AC(B+B') \\
 &= AB'C + AB'C + AB'C' + ABC + AB'C = AB'C + AB'C' + ABC
 \end{aligned}$$

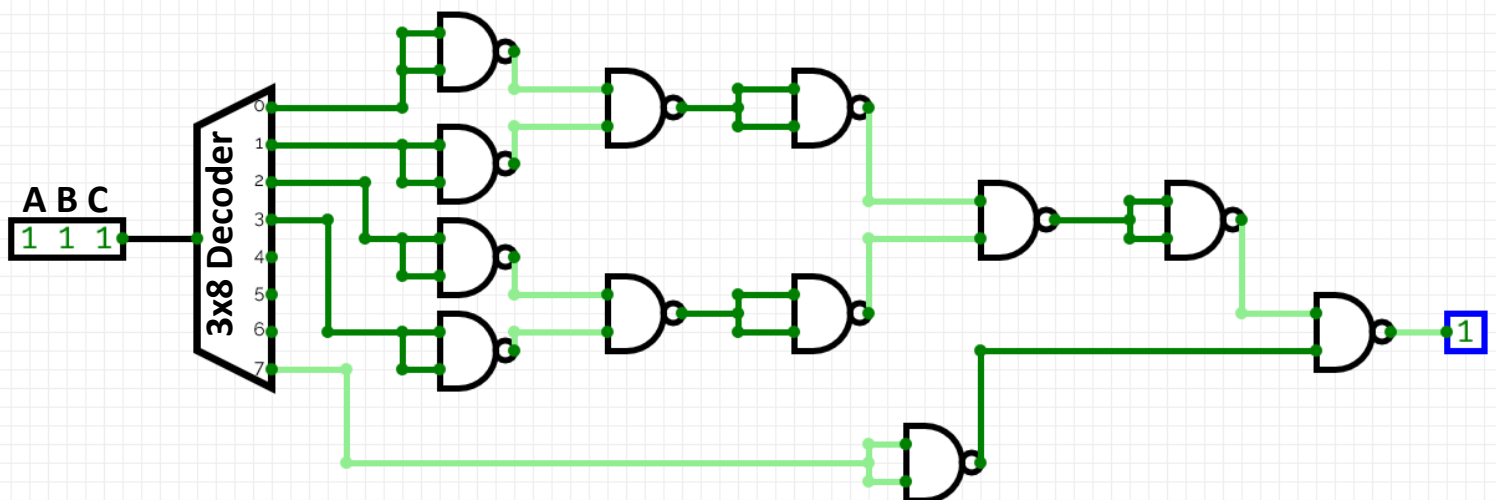


(B)

$$F(A, B, C) = (A' + B + C')(A' + B)(A' + C)$$

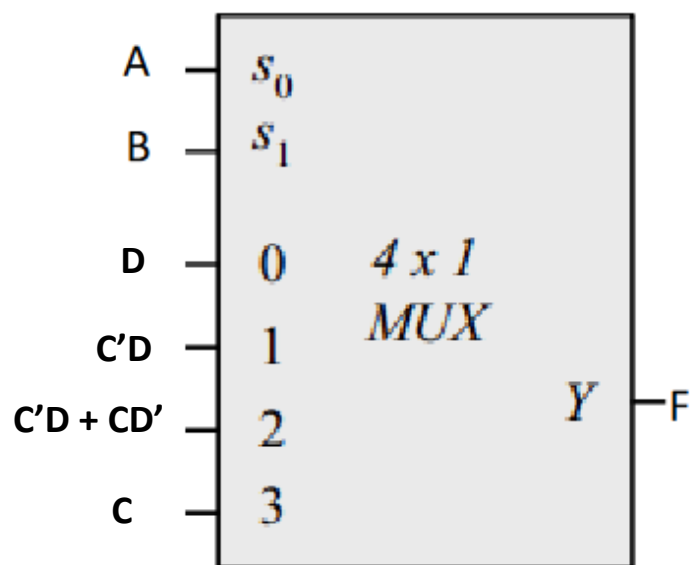
A	B	C	$A' + B + C'$	$A' + B$	$A' + C$	F
0	0	0	1	1	1	1
0	0	1	1	1	1	1
0	1	0	1	1	1	1
0	1	1	1	1	1	1
1	0	0	1	0	0	0
1	0	1	0	0	1	0
1	1	0	1	1	0	0
1	1	1	1	1	1	1

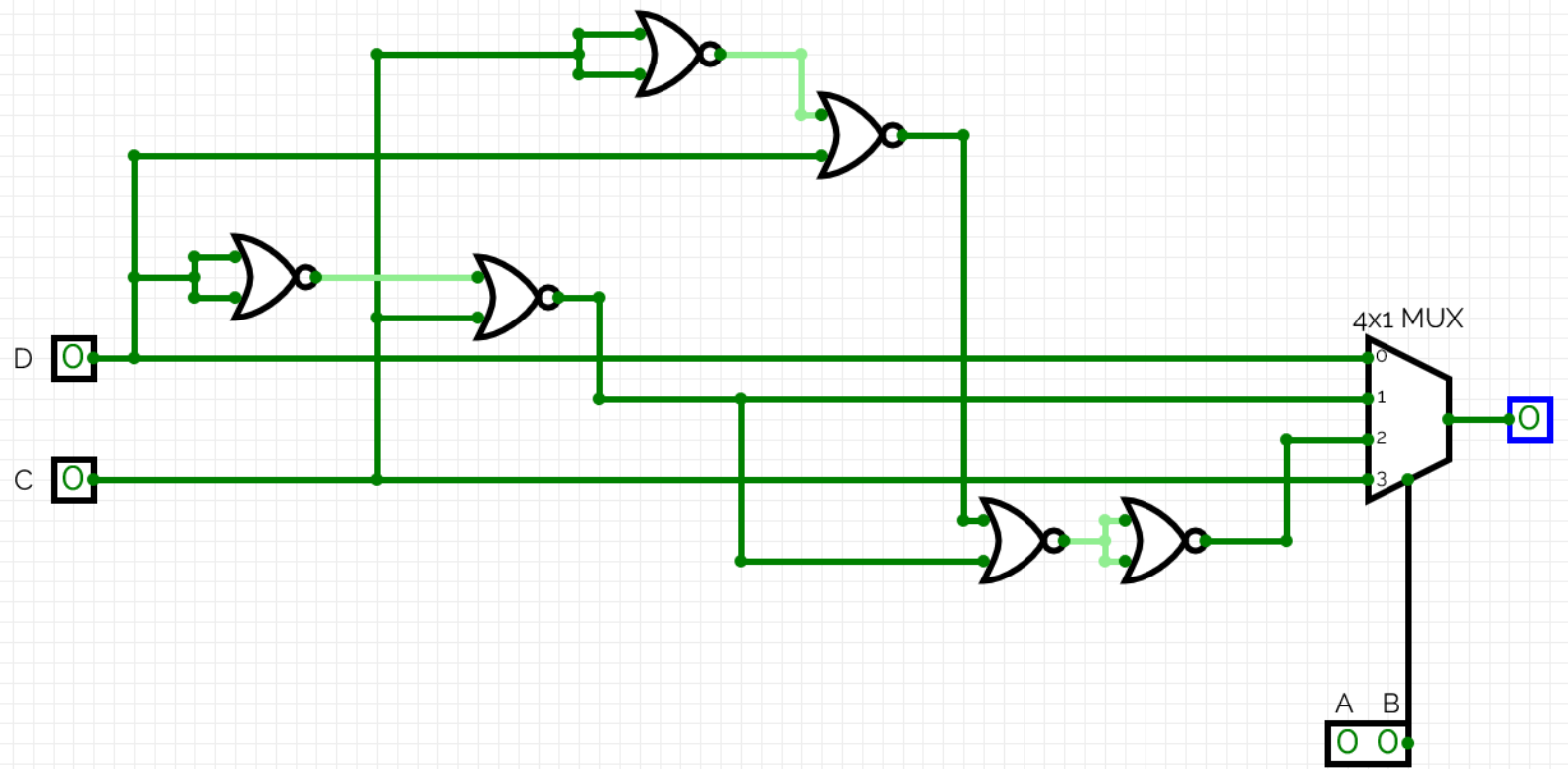
$$F(A, B, C) = A'B'C' + A'B'C + A'BC' + A'BC + ABC$$



(A)

A (s_0)	B (s_1)	C	D	F	
0	0	0	0	0	D
0	0	0	1	1	
0	0	1	0	0	
0	0	1	1	1	
0	1	0	0	0	C'D
0	1	0	1	1	
0	1	1	0	0	
0	1	1	1	0	
1	0	0	0	0	C'D + CD'
1	0	0	1	1	
1	0	1	0	1	
1	0	1	1	0	
1	1	0	0	0	C
1	1	0	1	0	
1	1	1	0	1	
1	1	1	1	1	





(B)

A (s2)	B (s1)	C (s0)	D	F
0	0	0	0	0
0	0	0	1	1
0	0	1	0	0
0	0	1	1	1
0	1	0	0	0
0	1	0	1	1
0	1	1	0	0
0	1	1	1	0
1	0	0	0	0
1	0	0	1	1
1	0	1	0	1
1	0	1	1	0
1	1	0	0	0
1	1	0	1	0
1	1	1	0	1
1	1	1	1	1

Groupings for F:

- Rows 1-2: D
- Rows 3-4: D
- Rows 5-6: D
- Rows 7-8: 0
- Rows 9-10: D
- Rows 11-12: D'
- Rows 13-14: 0
- Rows 15-16: 1

