Computer Science CSCI 355

Digital Logic and Computer Organization

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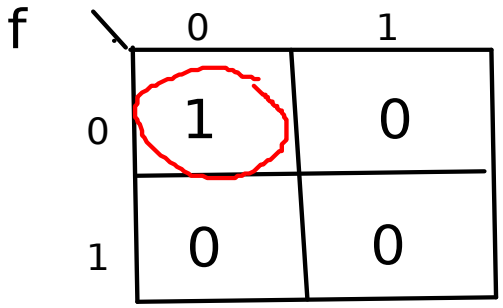
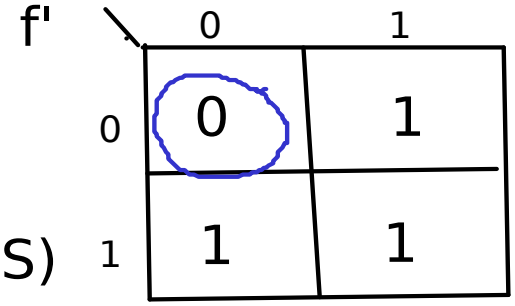
CMOS Logic Design

- Nor Gate

a	b	f
0	0	1
0	1	0
1	0	0
1	1	0





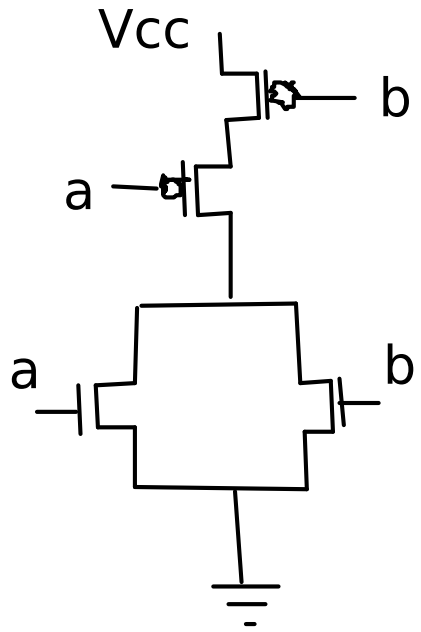
f (p-type) = a'b' (SOP)

f' (n-type) = a + b (POS)

CMOS Logic Design cont.

- Nor Gate

a	b	f
0	0	1
0	1	0
1	0	0
1	1	0

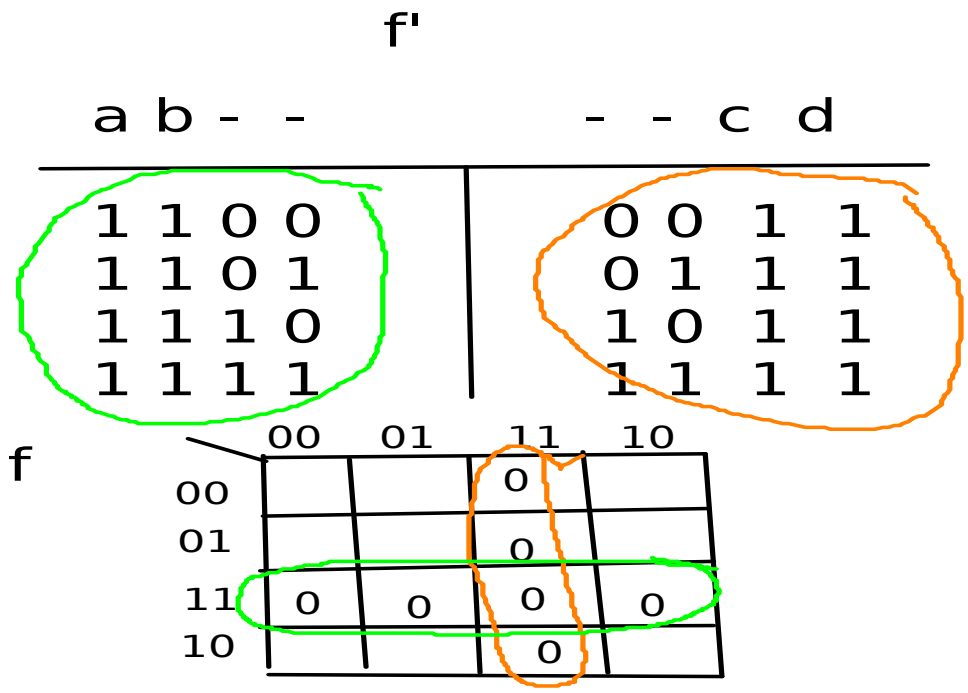


f (p-type) = a'b' (SOP)

f' (n-type) = a + b (POS)

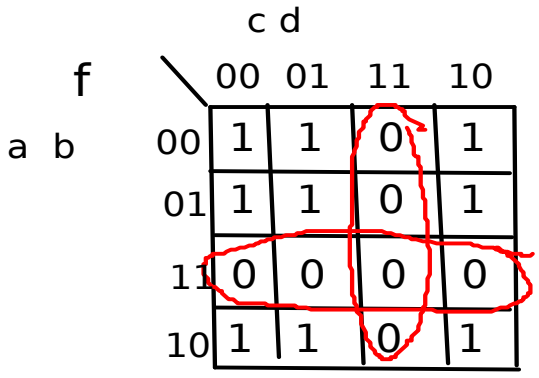
Implement f in CMOS

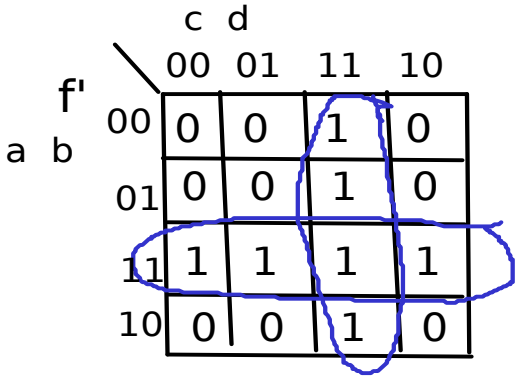
- $f = \overline{ab + cd}$



Implement f in CMOS cont.

- $f = \Sigma m\ (0, 1, 2, 4, 5, 6, 8, 9, 10)$





f (SOP) = ?

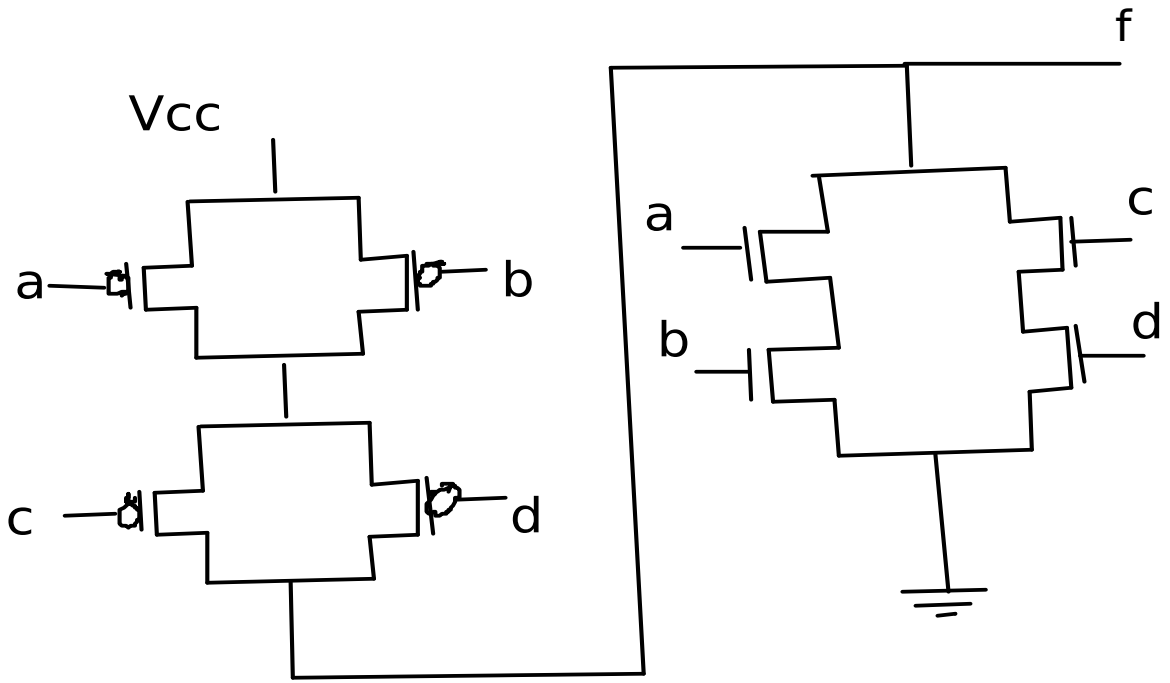
f' (SOP) = ab + cd

f (POS) = (a' + b')(c' + d')

f' (POS) = ?

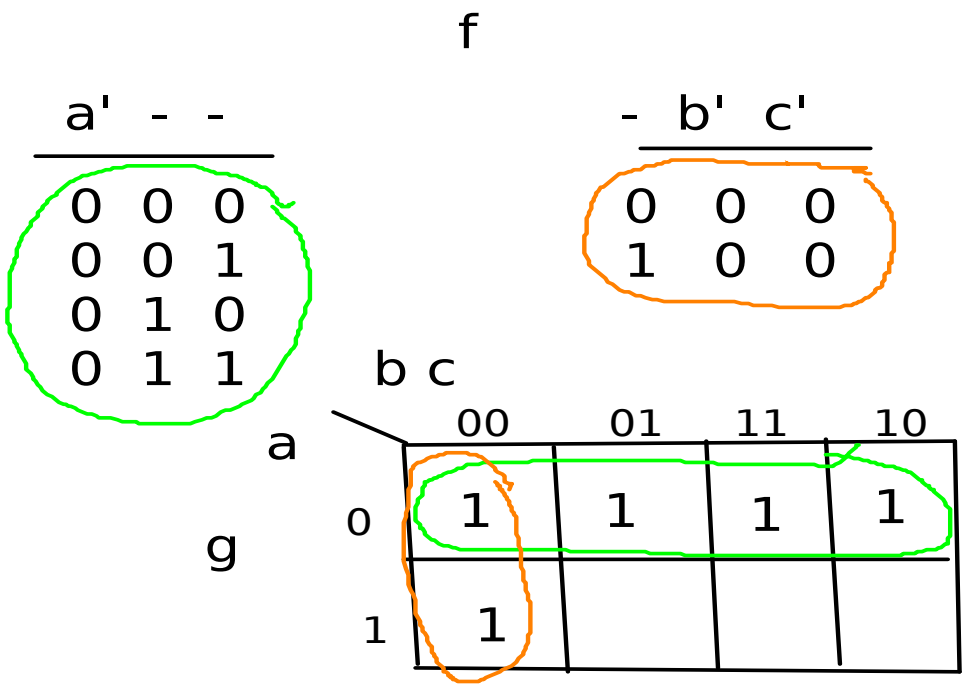
Implement f in CMOS cont.

○ $f = (\overline{a} + \overline{b})(\overline{c} + \overline{d})$ $\overline{f} = ab + cd$



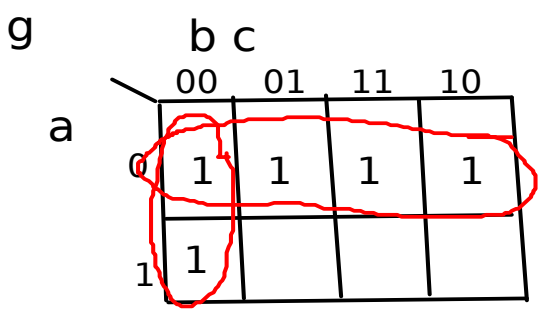
Implement g in CMOS

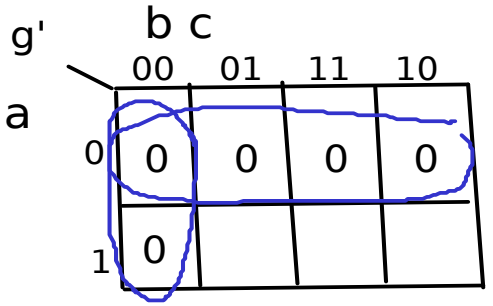
- $f = \overline{a} + \overline{b}\overline{c}$



Implement g in CMOS cont.

- $f = \Sigma m\ (0, 1, 2, 3, 4)$





g(SOP) = a' + b'c'

g(POS) = ?

g'(SOP) = ?

g'(POS) = (a)(b + c)

Implement g in CMOS cont.

- $f = \Sigma m\ (0, 1, 2, 3, 4)$