CSE 370 Spring 2000
Solutions for Assignment 3
04/06/2000

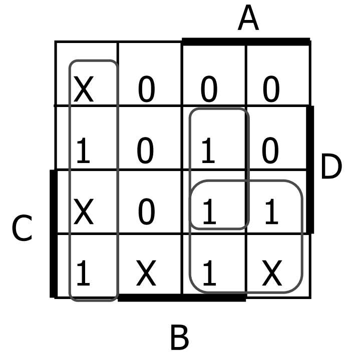
1.

A	B	C	D	F
0	0	0	0	0
0	0	0	1	0
0	0	1	0	0
0	0	1	1	1
0	1	0	0	1
0	1	0	1	0
0	1	1	0	1
0	1	1	1	0
1	0	0	0	1
1	0	0	1	1
1	0	1	0	0
1	0	1	1	0
1	1	0	0	1
1	1	0	1	1
1	1	1	0	0
1	1	1	1	0

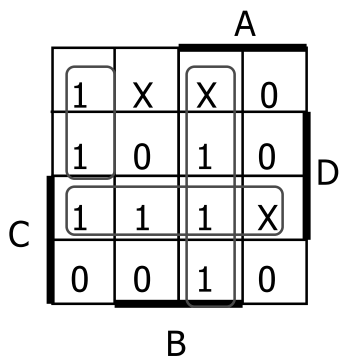
a) f = $\Pi M(0,1,2,5,7,10,11,14,15)$
b) f = $\Sigma m(3,4,6,8,9,12,13)$
c) f’ = $\Pi M(3,4,6,8,9,12,13)$
d) f’ = $\Sigma m(0,1,2,5,7,10,11,14,15)$

2.

a) A’B’ + AC + ABD

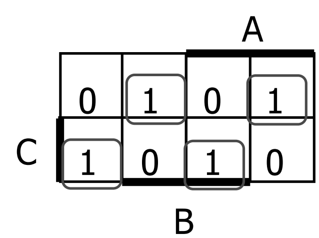


b) AB + CD + A’B’C’



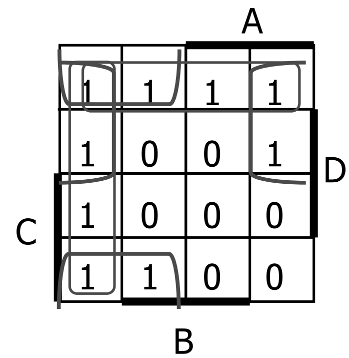
c) AB’C’ + ABC + A’BC’ + A’B’C

A	B	C	F
0	0	0	0
0	0	1	1
0	1	0	1
0	1	1	0
1	0	0	1
1	0	1	0
1	1	0	0
1	1	1	1



3.

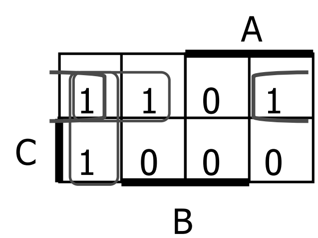
A	B	C	D	Adj
0	0	0	0	1
0	0	0	1	1
0	0	1	0	1
0	0	1	1	1
0	1	0	0	1
0	1	0	1	0
0	1	1	0	1
0	1	1	1	0
1	0	0	0	1
1	0	0	1	1
1	0	1	0	0
1	0	1	1	0
1	1	0	0	1
1	1	0	1	0
1	1	1	0	0
1	1	1	1	0



Adj = $\sum m(0,1,2,3,4,6,8,9,12)$
= C′D′ + A′B′ + B′C′ + A′D′

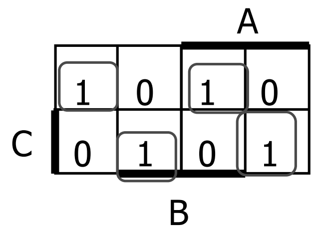
4.

A	B	C	Y1	Y0
0	0	0	1	1
0	0	1	1	0
0	1	0	1	0
0	1	1	0	1
1	0	0	1	0
1	0	1	0	1
1	1	0	0	1
1	1	1	0	0

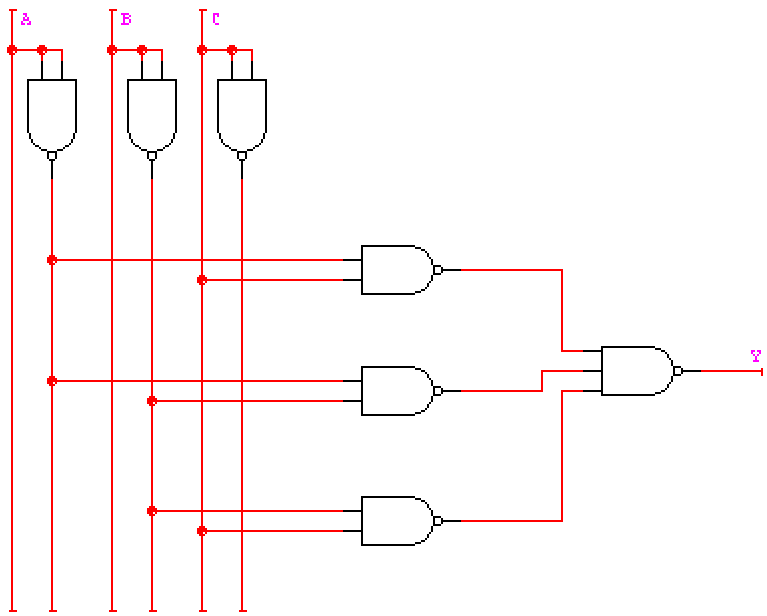


Y1 = A′C′ + A′B′ + B′C′

Y0 = A'B'C' + A'BC + ABC' + AB'C

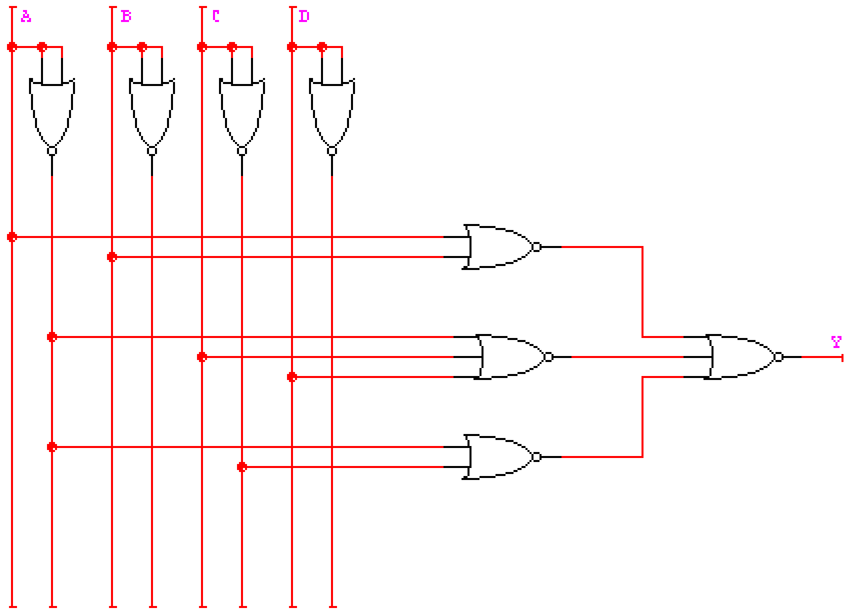


5. Y = (AB)'(A'C')' = (A' + B')(A + C) = A'C + AB' + B'C



6.

Y = (A + B)(A' + C + d)(A' + C')



7.

a. (B ⊕ C)(A ⊕ B)′ + (A ⊕ B)(B ⊕ C)′

b.

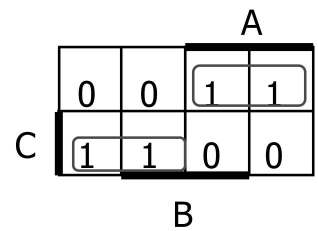
A	B	C	A ⊕ B	B ⊕ C	Y
0	0	0	0	0	0
0	0	1	0	1	1
0	1	0	1	1	0
0	1	1	1	0	1
1	0	0	1	0	1
1	0	1	1	1	0
1	1	0	0	1	1
1	1	1	0	0	0

c. Y = $\Sigma m(1,3,4,6)$

d.

(B ⊕ C)(A ⊕ B)′ + (A ⊕ B)(B ⊕ C)′	
= (BC′ + B′C)(AB′ + A′B)′ + (AB′ + A′B)(BC′ + B′C)′	By definition of xor
= (BC′ + B′C)(A′ + B)(A + B′) + (AB′ + A′B)(B′ + C)(B + C′)	De Morgans law
= (BC′ + B′C)(A′B′ + AB) + (AB′ + A′B)(B′C′ + BC)	Distributive law and Theorem of complementarity
= ABC′ + A′B′C + AB′C′ + A′BC	Distributive law and Theorem of complementarity
= AC′(B + B′) + A′C(B + B′)	Distributive law
= AC′ + A′C	Theorem of complementarity

e. Y = AC’ + A’C



f. Y’ = A’C’ + AC