Assignmengt1

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1. 247.8 base 3:

Division	Quotient	Remainder
247/3	82	1
82/3	27	1
27/3	9	0
9/3	3	0
3/3	1	0
1/3	0	1

Therefore, $247_{10} = 100011_3$

$0.8 \times 3 = \underline{2}.4$ $0.4 \times 3 = \underline{1}.2$ $0.2 \times 3 = \underline{0}.6$ $0.6 \times 3 = \underline{1}.8 \cdots$

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Therefore, $(247.8)_{10} \approx (100011.2101)_3$

247.8 base 4

Division	Quotient	Remainder
247/4	61	3
61/4	15	1
15/4	3	3
3/4	0	3

Therefore, $247_{10} = 3313_4$

$0.8 \times 4 = 3.2$ $0.2 \times 4 = 0.8$ $0.8 \times 4 = 3.2$ $0.2 \times 4 = 0.8$

Therefore, $(247.8)_{10} \approx (3313.30)_4$

247.8 base 5

Division	Quotient	Remainder
247/5	49	2
49/5	9	4
9/5	1	4
1/5	0	1

Therefore, $247_{10} = 1442_5$

$0.8 \times 5 = 4.0$

Therefore, $(247.8)_{10} = (1442.4)_5$

247.8 base 11

Division	Quotient	Remainder
247/11	22	5
22/11	2	0
2/11	0	2

Therefore, $247_{10} = 205_{11}$

$0.8 \times 11 = 8.8$ $0.8 \times 11 = 8.8$

Therefore, $(247.8)_{10} \approx (205.8)_{11}$

247.8 base 16

Division	Quotient	Remainder
247/16	15	7
15/16	0	15/F

Therefor, $247_{10} = F7_{16}$

$0.8 \times 16 = 12.8$ $0.8 \times 16 = 12.8$

Therefore, $(247.8)_{10} \simeq (F7.C)_{15}$

2. This is a r-1's complement.
$(AAA)_{11} - (349)_{11} = (761)_{11}$
The 10's complement of $(349)_{11}$ is $(761)_{11}$.

3. (a). $A=1, B=0, C=1$
Hence, $A'=0, B'=1, C'=0$
Hence $F=AB'C'+AB=1\cdot1\cdot0+1\cdot0=0$

(b) $A=0, B=1, C=1$
Hence, $A'=1, B'=0, C'=0$.
Hence, $F=AB'C'+AB=0\cdot0\cdot0+0\cdot1=0$

(c) $A=0, B=0, C=0$
Hence, $A'=1, B'=1, C'=1$
Hence, $F=AB'C'+AB=0\cdot1\cdot1+0\cdot0=0$.

4. (a) $F = \Sigma(1,2,5,6)$

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

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

$= B'C + BC'$

(b) $F = \Sigma(0,1,2,3,7)$

$= A'B'C' + A'B'C + A'BC' + A'BC + ABC$

$= A'B'(C'+C) + A'B(C+C') + ABC$

$= A'B' + A'B + ABC = A'(B+B') + ABC = A' + ABC$

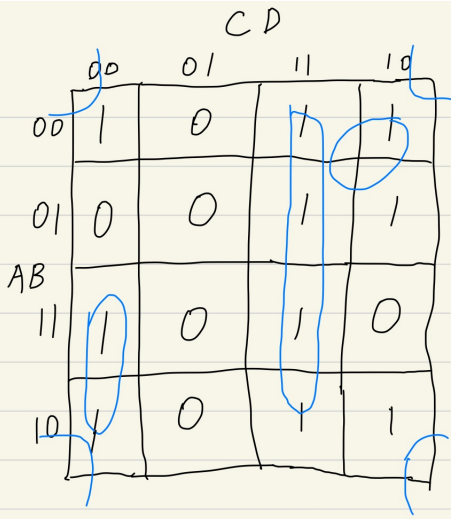
(c) $F = \Sigma(3,5,6,7)$

$= A'BC + AB'C + ABC' + ABC$

$= A'BC + AB'C + AB(C+C')$

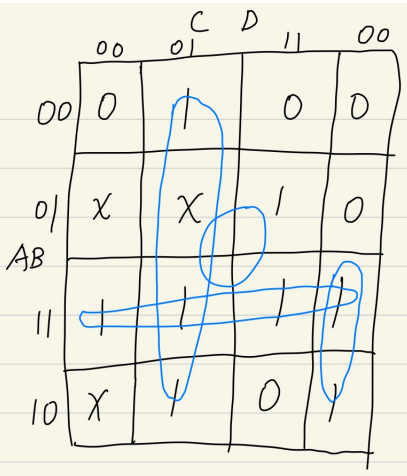
$= A'BC + AB'C + AB$

5.(a). $F(A,B,C,D)$
$= \Sigma(0,2,3,6,7,8,10,11,12,15)$
$= B'D' + AC'D' + CD + A'C$



(b) $F = \Sigma(1,7,9,10,12,13,14,15) + d(4,5,8)$

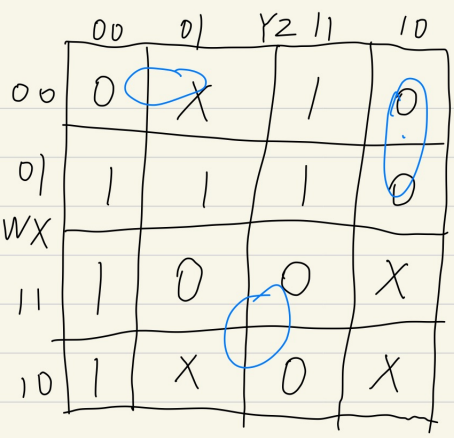
$= AB + C'D + BD + AC'D'$



(c) $F = \Pi(0,2,6,11,13,15) + d(1,9,10,14)$

$F' = w'x'y' + w'yz' + wz$

$F = (w+x+y)(w+y'+z)(w'+z')$



6. $f = abc' + c'd + a'cd' + b'cd'$

The map of f is:

ab \ cd	00	01	11	10
00	0	1	0	1
01	0	1	0	1
11	1	1	0	0
10	0	1	0	1

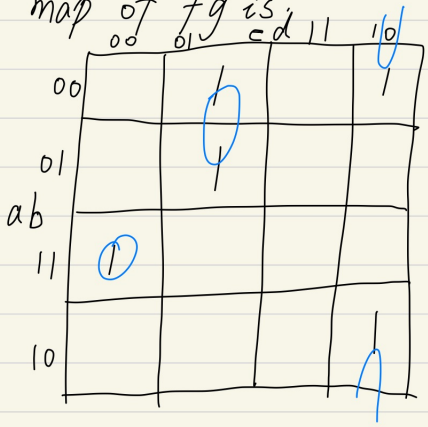
$g = (a+b+c'+d')(b'+c'+d)(a'+c+d')$

$g' = a'b'cd + bcd' + ac'd$

The map of g is:

ab \ cd	00	01	11	10
00	1	1	0	1
01	1	1	1	0
11	1	0	1	0
10	1	0	1	1

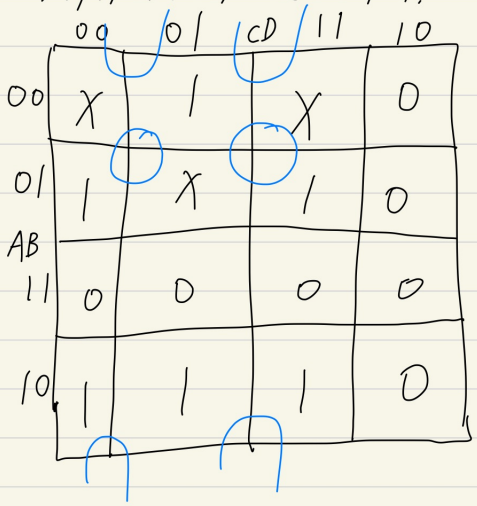
According to the maps of f and g, we know that the map of fg is:



0 1 1 1

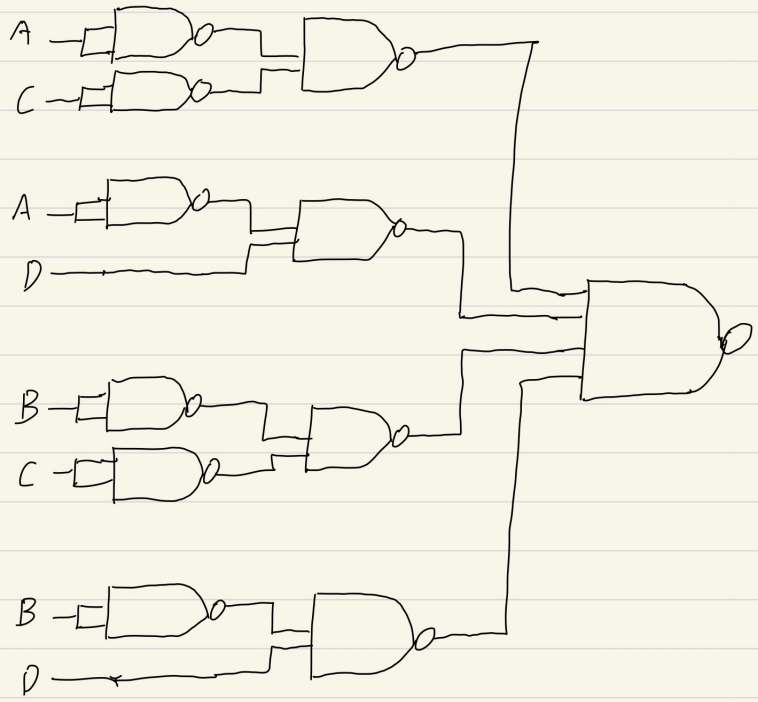
Hence, $F = fg = abc'd' + a'c'd + b'cd'$

7. $F = \Sigma(1,4,7,8,9,11) + d(0,3,5)$



Hence, $F = A'C' + A'D + B'C' + B'D$

(a) NAND gates only:



(b). NOR gates only