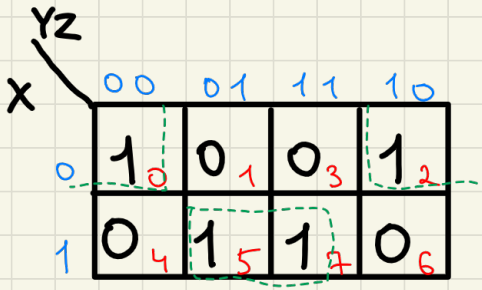
LAB 3

Question 1.

$$F(X,Y,Z) = \Sigma m(0,2,5,7)$$



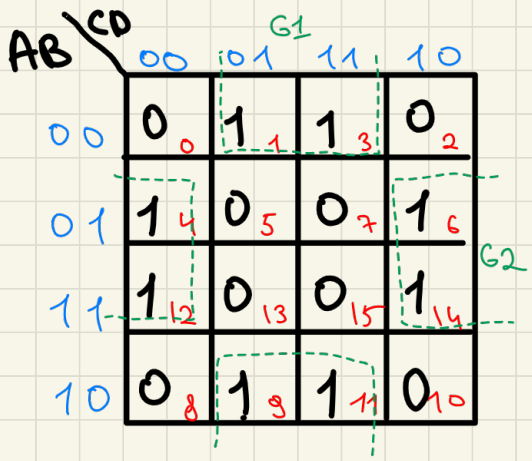
SOP

Ident. $x=1$

comp. $x'=0$

$$F(X,Y,Z) = X'Z' + XZ$$

$$G(A,B,C,D) = \Sigma m(1,3,4,6,9,11,12,14)$$



SOP

Ident. $x=1$

comp. $x'=0$

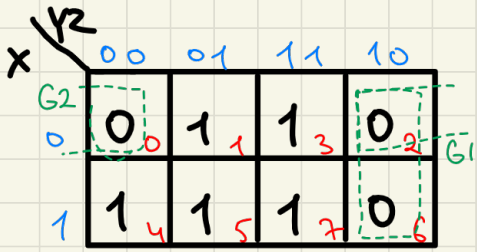
$G1 = B' \cdot C'D \cdot CD = B'D$

$G2 = B \cdot C'D' \cdot CD' = BD'$

$$G(A,B,C,D) = B'D + BD'$$

Question 2

$$H(X,Y,Z) = \Pi M(0,2,6)$$



POS

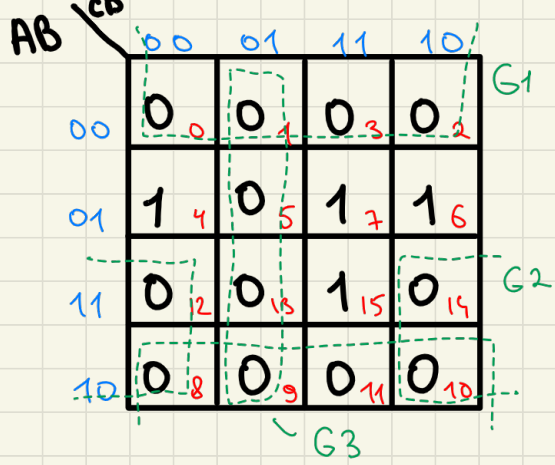
Ident. $x = 0$

Compl. $x' = 1$

$G1 = Y' + Z$ $\quad$ $G2 = X + Z$

$$H(X,Y,Z) = (Y' + Z)(X + Z)$$

$$L(A,B,C,D) = \Sigma m(4,6,7,15)$$



POS

Ident. $x=0$

Compl. $x'=1$

$G1 = B$

$G2 = A' + D$

$G3 = C + D'$

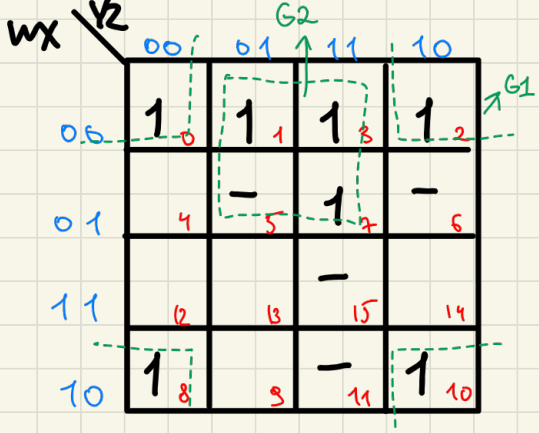
$$L(A,B,C,D) = B\,(A'+D)(C+D')$$

Question 3

$$F(W,X,Y,Z) = \Sigma m(0,1,2,3,7,8,10)$$

$$dc\,(W,X,Y,Z) = \Sigma m(5,6,11,15)$$

1) for SOP form



SOP

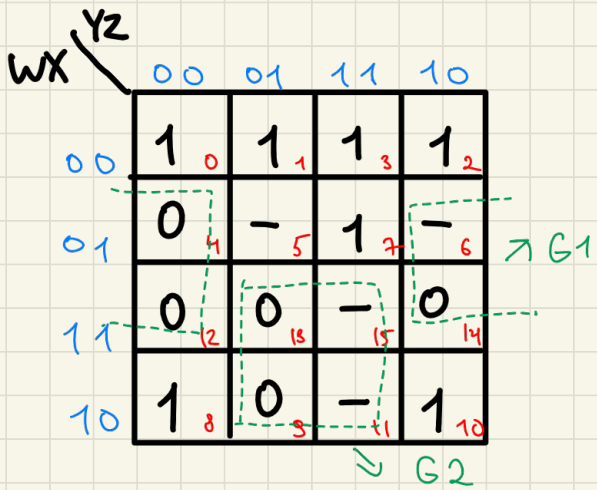
Ident $x=1$

Comp $x'=0$

$G1 = X'Z' \quad G2 = W'Z$

$$F(W,X,Y,Z) = X'Z' + W'Z$$

2) For POS



for POS

Ident. $x=0$

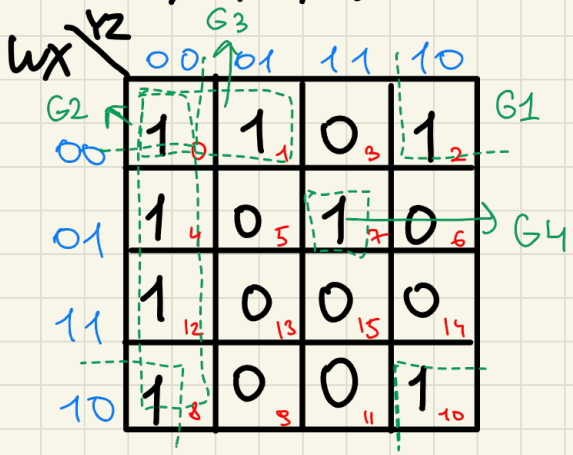
Compl. $x'=1$

$G1 = X' + Z \quad G2 = W' + Z'$

$$F(W,X,Y,Z) = (X'+Z)(W'+Z')$$

Question 4

$$F(W,X,Y,Z) = \Sigma m(0,1,2,4,7,8,10,12)$$



for SOP

Ident. $x=1$

Compl. $x'=0$

Group 1: $X'Z'$ Group 2: $Y'Z'$

Group 3: $W'X'Y'$ Group 4: $W'XYZ$

$$F(W,X,Y,Z) = X'Z' + Y'Z' + W'X'Y' + W'XYZ$$

Question 5

$$WXY' + WXZ' + WXZ + YZ'$$

$$WXZ' + WXZ = WX(Z + Z') = WX$$

$$WXY' + WX + YZ' \quad \text{(Absorpt.)}$$

$$WX + YZ'$$

W	X	Y	Z	Z'	WX	YZ'	WX+YZ'
0	0	0	0	1	0	0	0
0	0	0	1	0	0	0	0
0	0	1	6	1	0	1	1
0	0	1	1	0	0	0	0
0	1	0	0	1	0	0	0
0	1	0	1	0	0	0	0
0	1	1	0	1	0	1	1
0	1	1	1	0	0	0	0
1	0	0	0	1	0	0	0
1	0	0	1	0	0	0	0
1	0	1	0	1	0	1	1
1	0	1	1	0	0	0	0
1	1	0	0	1	1	0	1
1	1	0	1	0	1	0	1
1	1	1	0	1	1	1	1
1	1	1	1	0	1	0	1

Sum of Minterms

$\Sigma m(2, 6, 10, 12, 13, 14, 15)$

Product of Maxterms

$\Pi m(0, 1, 3, 4, 5, 7, 8, 9, 11)$