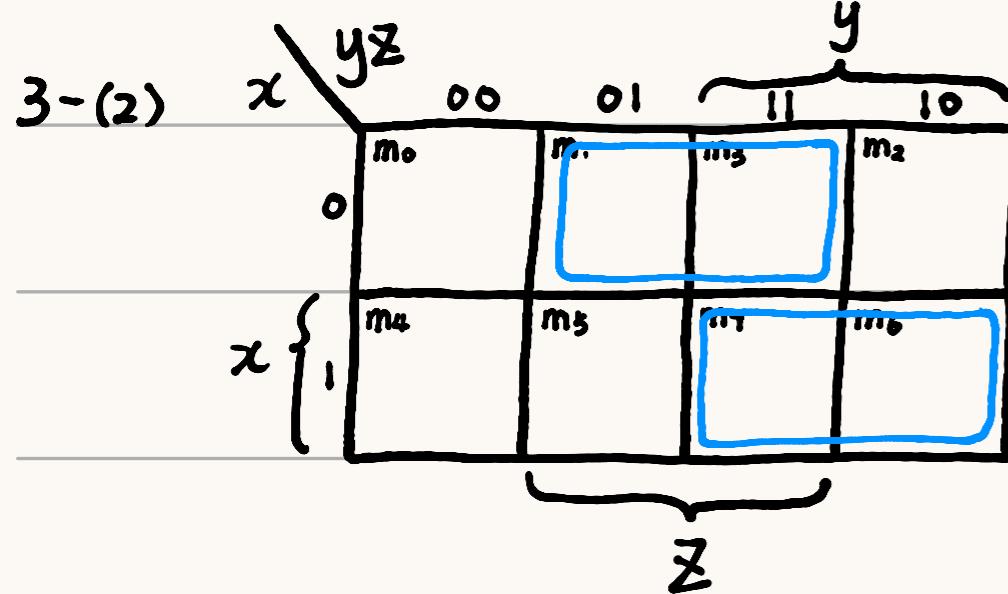


HW in slides

$$3-(1) F = x'y + xy' + xy = (x'y + xy) + (xy' + xy)$$

$$= (x' + x)y + x(y' + y) = x + y$$



$$\therefore F = xy + x'z = x'y'z + x'yz + xyz' + xyz = \sum(1, 3, 6, 7)$$

$$3-(3) F = \sum(0, 2, 4, 5, 6) = x'y'z' + xy'z' + x'yz' + xy'z + xyz'$$

$$= (x' + x)y'z' + (x' + x)yz' + xy'z + xyz'$$

$$= y'z' + yz' + xy'(z + z')$$

$$= (y' + y)z' + xy'$$

$$= z' + xy'$$

$$3-(4) F = A'B'C' + B'CD' + A'BCD' + AB'C'$$

$$= (A' + A)B'C' + (A' + 1)B'CD' + A'BCD'$$

$$= B'C' + A'B'CD' + A'BCD' + B'CD'$$

$$= B'C'(1 + D') + A'CD'(B' + B) + B'CD'$$

$$= B'C' + A'CD' + B'D'(C' + C)$$

$$= B'C' + B'D' + A'CD'$$

$$3-(5) F = xy' + x'y + z$$

$$F' = x'y'z' + xyz'$$

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

$$= (x'y'z')'(xyz')'$$

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

$$= [(x + y + z)' + (x' + y' + z)']'$$



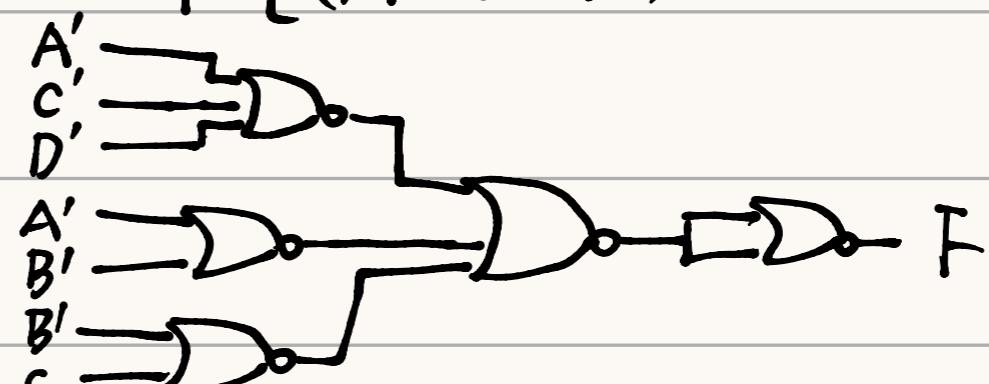
$$3-(6) F = A(CD + B) + BC'$$

$$F' = (ACD + AB + BC')'$$

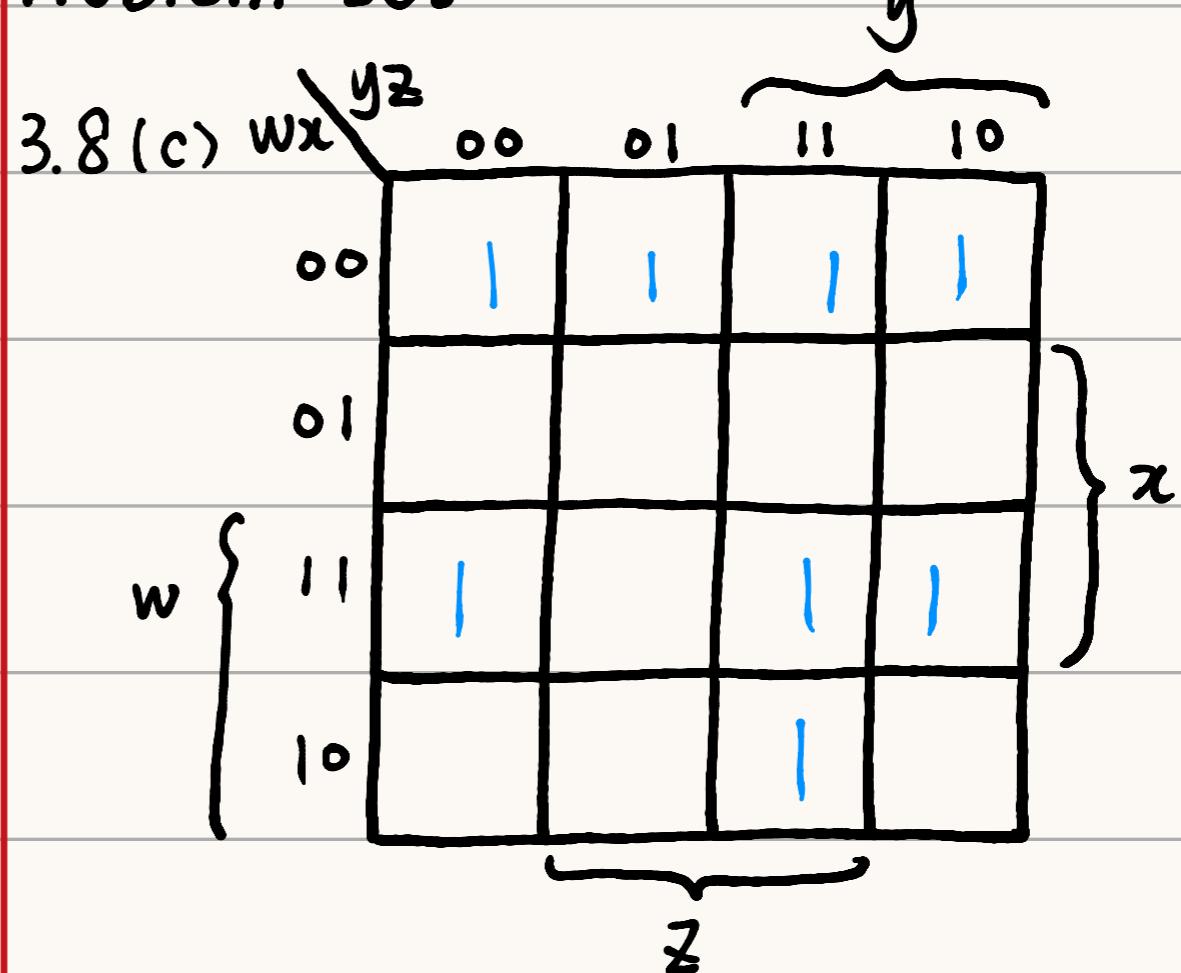
$$F' = (ACD)'(AB)'(BC')'$$

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

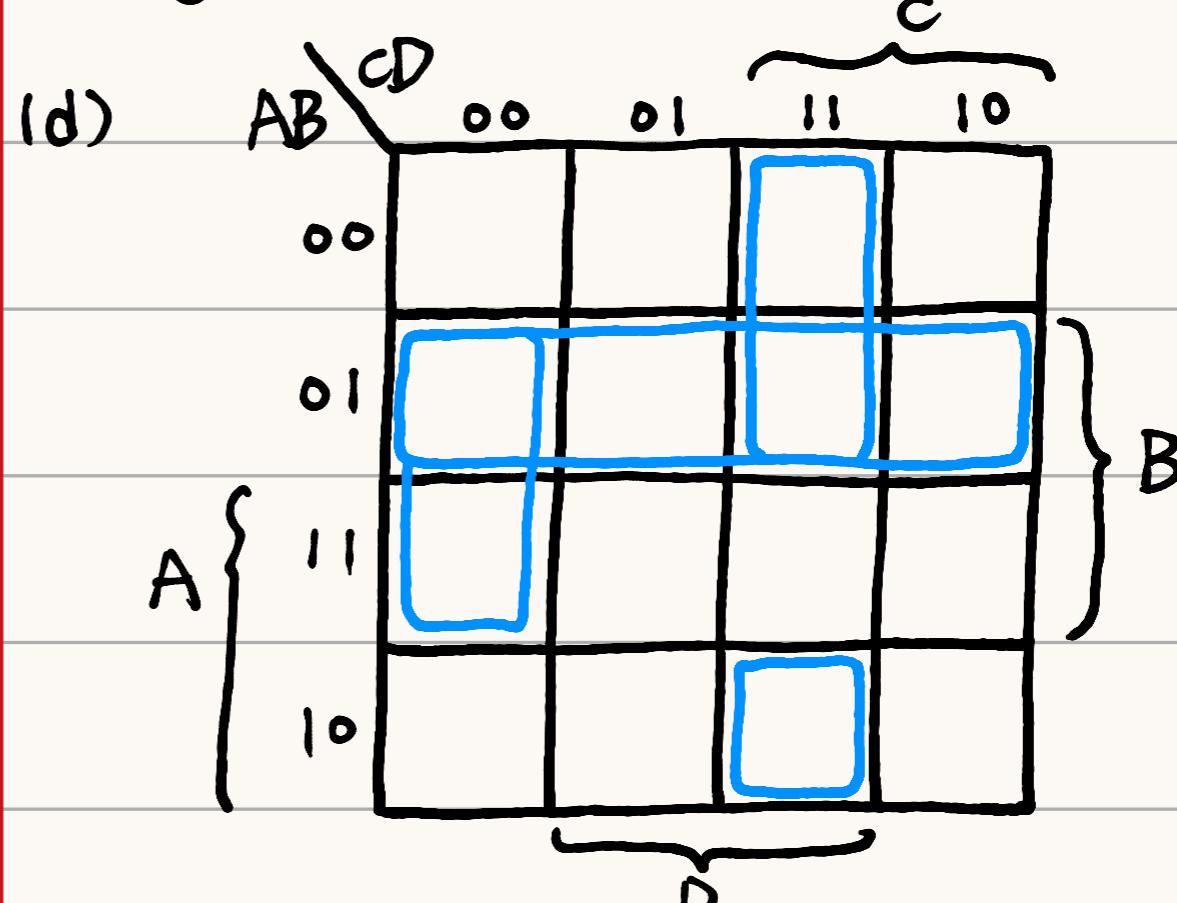
$$F = [(A' + C' + D')' + (A' + B')' + (B' + C')']''$$



Problem set



$$wyz + w'x' + wxz' = \sum(0, 1, 2, 3, 11, 12, 14, 15)$$



$$A'B + A'CD + B'CD + BC'D' = \sum(3, 4, 5, 6, 7, 11, 12)$$

$$9.1(c) F = BC' + A'C + AB'D$$

essential: BC' , $A'C$, $AB'D$

$$(d) \sum(1, 3, 6, 7, 8, 9, 12, 13, 14, 15)$$

$$F = wy' + xy + xz w'$$

essential: wy' xy $xz w'$ yang Zhang bracket_x@163.com

$$\begin{aligned}
 13. (b) SOP & ACD' + C'D + AB' + ABCD \\
 &= C'D + AB' + AB'CD + ABCD + ACD' \\
 &= C'D + AB' + ACD + ACD' \\
 &= C'D + AB' + AC
 \end{aligned}$$

$$POS \quad F' = A'C + A'D' + BC'D'$$

$$\begin{aligned}
 F &= (A'C + A'D' + BC'D')' \\
 &= (A'C)'(A'D')'(BC'D')' \\
 &= (A+C')(A + D)(B' + C + D)
 \end{aligned}$$

$$(d) SOP \quad BCD' + ABC' + ACD = AB + ACD + BCD'$$

$$\begin{aligned}
 POS \quad F' &= A'B' + A'C' + B'C' + A'D + ACD' \\
 F &= (A'B' + A'C' + B'C' + A'D + ACD')' \\
 &= (A'B')'(A'C')'(B'C')'(A'D)'(ACD')' \\
 &= (A+B)(A + C)(B + C)(A + D')(A' + C'D)
 \end{aligned}$$

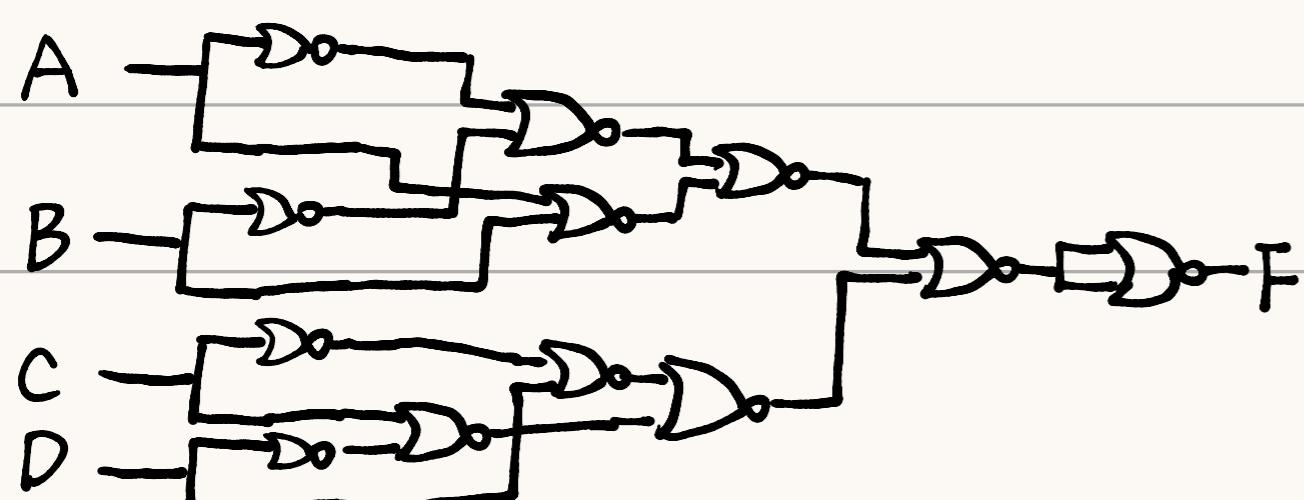
15. let d all be 1

$$F(x, y, z) = (0, 1, 2, 3, 4, 5, 6, 7)$$

$$\therefore F(x, y, z) = 1$$

18. NOR(A, A) $\Rightarrow A'$

$$\begin{aligned}
 F(A, B, C, D) &= (A \oplus B)'(C \oplus D)' \\
 &= (AB + A'B')(C'D + CD')' \\
 &= [(AB + A'B')(CD' + C'D')]'' \\
 &= [(AB + A'B')' + (CD' + C'D')']' \\
 &= [(A'+B')' + (A+B)']' + [(C'+D')' + (C+D)]' '
 \end{aligned}$$



$$\begin{aligned}
 F &= (AB + A'B')(C'D + CD') \\
 F &= [(AB + A'B')(C'D + CD')]'' \\
 &= [(AB + A'B')' + (C'D + CD')']' \\
 &= [(AB)'(A'B')' + (C'D)'(CD')']' \\
 &= [(AB)'(A'B')'][[(C'D)'(CD')']'] \\
 &= \{[(AB)'(A'B')][[(C'D)'(CD')']]'\}''
 \end{aligned}$$

$$23. \text{ let } (0, 8) = 1 \quad (1, 5) = 0$$

$$F' = D + A'BC$$

$$\begin{aligned}
 F &= (D + A'BC)' \\
 &= [D + ((A'BC) '')]' \\
 &= [D + (A + B' + C')']'
 \end{aligned}$$