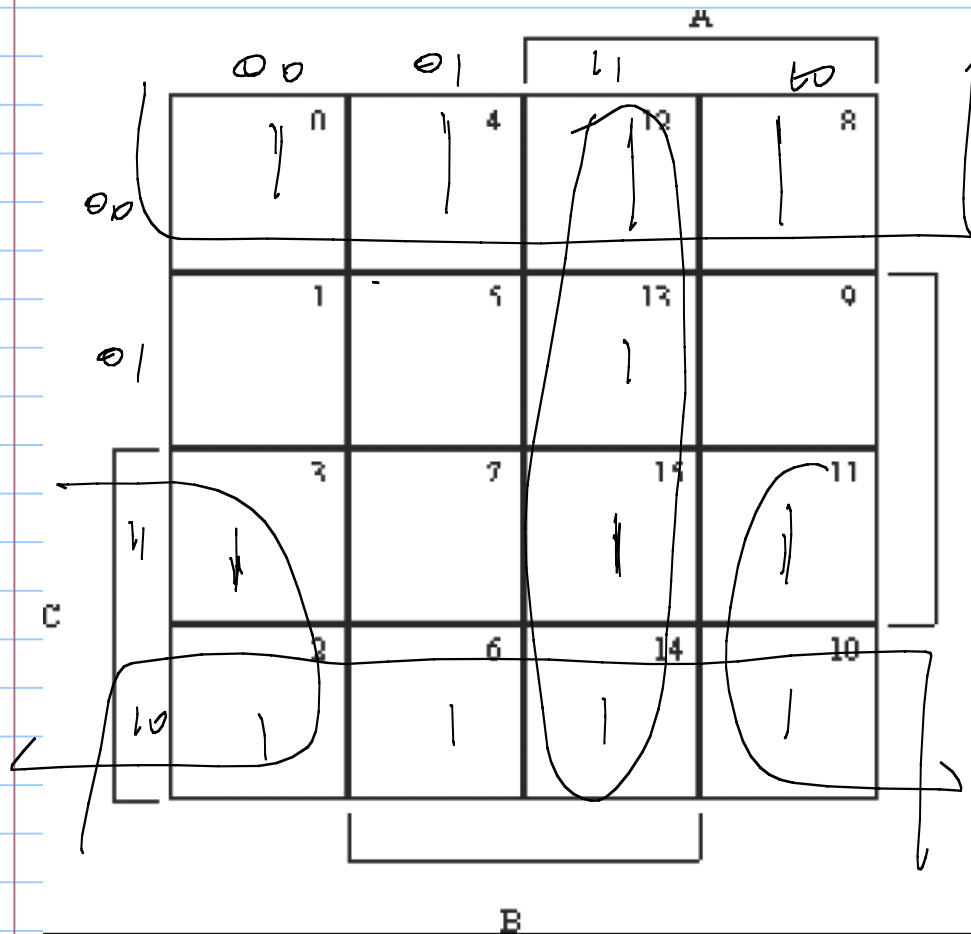


HW4 correction Ex 5.4.

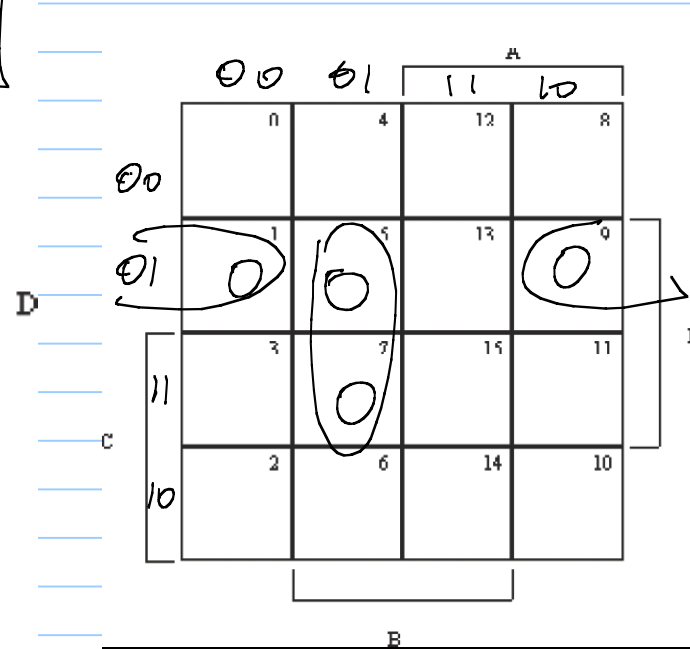
$$F(A, B, C, D) = \underbrace{BD'} + \underbrace{B'CD} + \underbrace{ABC} + \underbrace{ABC'D} + \underbrace{B'D'}$$

		A			
		00	01	11	10
C	00	0 1	4 1	12 1	8 1
	01	1 0	5 0	13 1	9 0
D	11	3 1	7 0	15 1	11 1
	10	2 1	6 1	14 1 1	10 1 1
		B			



(b)

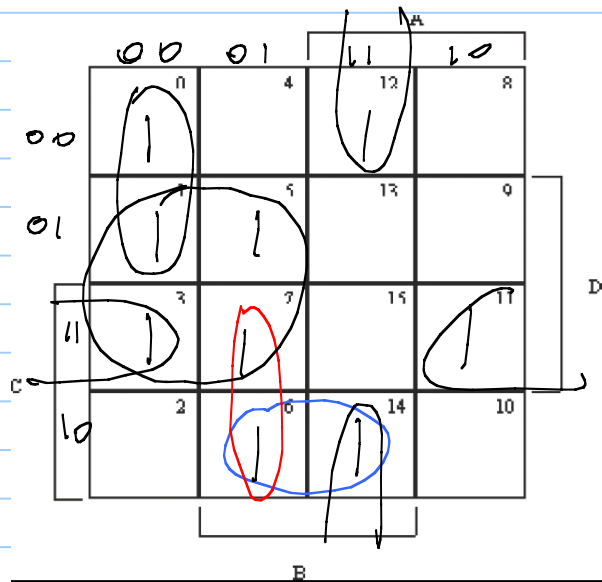
$$F(A, B, C, D) = D' + AB + B'C$$



- (c)
- (1) Find a minimal SOP realization for F'
 - (2) invert using De Morgan's

$$F' = A'BD + B'C'D$$

$$F = (F')' = (A'BD + B'C'D)' = (\text{De Morgan's law}) = (A + B' + D')(B + C + D')$$



5.6(a) Find a minimum SOP expression for
 $f(a, b, c, d) = \sum m(0, 1, 3, 5, 6, 7, 11, 12, 14)$

$$f(a, b, c, d) = abd' + a'd + b'cd + a'b'c' + \left. \begin{matrix} bcd' \\ a'bc \end{matrix} \right\}$$

	00		01		11		10	
	00		01		11		10	
00	0	1	0	0	0	0	0	0
01	0	1	1	1	1	1	1	1
11	X	X	X	X	X	X	X	0
10	1	0	X	X	X	X	1	0

5.8 (a) $f(a, b, c, d) = \prod M(0, 1, 6, 8, 11, 12) \cdot \prod D(3, 7, 14, 15)$

SOP expression: $a'b'c' + ac'd + b'cd'$

	00		01		11		10	
	00		01		11		10	
00	0	0	0	0	0	0	0	0
01	0	0	0	0	0	0	0	0
11	X	X	X	X	X	X	X	0
10	0	0	X	X	X	X	0	0

Two steps: f' , then f
 $f' = ac'd' + a'b'c' + cd + bc$
 $f = (f')' = (b+c)(c+d)(a'+c+d) \cdot (a+b+c)$

		A			
	00	01	11	10	
D	00	0	1	0	1
	01	0	1	0	0
C	11	1	1	1	1
	10	1	1	0	1
		B			

5.12(c) find min POS for

$$F(A, B, C, D) = AB'D' + A'B + A'C + CD$$

$$F' = A'B'C' + ABD' + AC'D$$

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

	00	01	11	10
00	0	0	X	1
01	1	0	0	1
11	1	X	1	0
10	0	X	0	0
	A	B	C	D

$$5.21 (d) f(A, B, C, D) =$$

$$= \sum m(1, 3, 8, 9, 15) + \sum d(6, 7, 12)$$

Need POS

$$f' = \frac{A'D'}{0_0} + \frac{BC'}{0_{13}} + \frac{CD}{0_{14}} + \frac{AB'C}{0_{14}}$$

These terms are essential

$$f = (f')' = (A+D) \cdot (B'+C) \cdot (C'+D) \cdot (A'+B+C')$$