

Homework 2 No. 4
 simplify each expression using Boolean Algebra

$$\begin{aligned}
 d. & \quad \overline{A}\overline{B}C + \overline{(A+B+\overline{C})} + \overline{A}\overline{B}\overline{C}D \\
 & \quad \overline{A}\overline{B}C + \overline{A+B+\overline{C}} + \overline{A}\overline{B}\overline{C}D \\
 = & \quad \overline{A}\overline{B}C + \overline{A}\overline{B}C + \overline{A}\overline{B}\overline{C}D \\
 = & \quad \overline{A}\overline{B}C + \overline{A}\overline{B}\overline{C}D \quad (\text{rule 5}) \\
 = & \quad \overline{A}\overline{B}(C + \overline{C}D) \quad (\text{factoring}) \\
 = & \quad \overline{A}\overline{B}(C + D) \quad (\text{rule 11}) \\
 = & \quad \boxed{\overline{A}\overline{B}C + \overline{A}\overline{B}D}
 \end{aligned}$$

Homework 4

8. Use a Karnaugh map to simplify each expression to a minimum SOP form:

$$\begin{aligned}
 c. & \quad \overline{A}(BC + B\overline{C}) + A(BC + B\overline{C}) \\
 & \quad \overline{A}(BC + B\overline{C}) + A(BC + B\overline{C}) \\
 = & \quad \overline{A}BC + \overline{A}B\overline{C} + ABC + AB\overline{C} \\
 & \quad \begin{array}{cc} 011 & 010 \end{array} \quad \begin{array}{cc} 111 & 110 \end{array}
 \end{aligned}$$

		C		
		0	1	
A \ B	0			
	1			
0	0			
0	1	1	1	= B
1	1	1	1	
1	0			

minimized SOP = \boxed{B}

Ex. Use a K-map to minimize the following POS Expression:

$$\begin{aligned}
 & (A + B + C)(A + B + \bar{C})(A + \bar{B} + C)(A + \bar{B} + \bar{C})(\bar{A} + \bar{B} + C) \\
 & (0 + 0 + 0)(0 + 0 + 1)(0 + 1 + 0)(0 + 1 + 1)(1 + 1 + 0)
 \end{aligned}$$

		C		
		0	1	
A \ B	0	0	0	
	1	0	0	
0	0	0	0	
0	1	0	0	
1	1	0		
1	0			

$$A(\bar{B} + C)$$

$$(0+0+0+0)(0+0+1+0)(1+0+0+1)$$

$$(B+C+D)(A+B+\bar{C}+D)(\bar{A}+B+C+\bar{D})$$

$$(A+\bar{B}+C+D)(\bar{A}+\bar{B}+C+D)$$

$$(0+1+0+0)(1+1+0+0)$$

AB \ CD	00	01	11	10
00	0			0
01	0			
11	0			
10		0		

$$(A+B)(C)(\bar{B}+\bar{C})$$

$$\begin{aligned}
 & (0 + 0 + 0 + 0) (0 + 0 + 1 + 0) (1 + 0 + 0 + 1) \\
 & (0 + 1 + 0 + 0) (1 + 1 + 0 + 0) (1 + 0 + 0 + 0)
 \end{aligned}$$

		C			
AB		00	01	11	10
00		0			0
01		0			
11		0			
10		0	0		

$(C + D) (\bar{A} + B + C) (A + B + D)$

Chapter 5

AND - OR Expression

$AB + BC \rightarrow \text{SOP expression}$
 $\uparrow \quad \uparrow \quad \uparrow$
 AND OR AND

