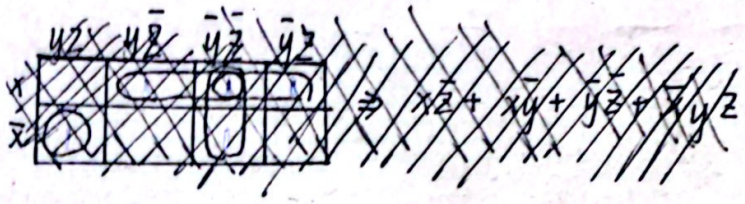
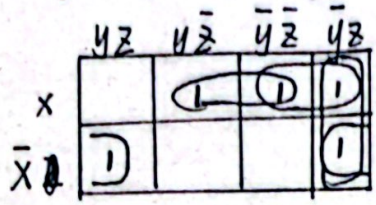
Homework 10 22CST 蒋翔翔

Section 12.4

Ex.12

(c) $xy\bar{z} + x\bar{y}z + x\bar{y}\bar{z} + \bar{x}yz + \bar{x}\bar{y}z$:

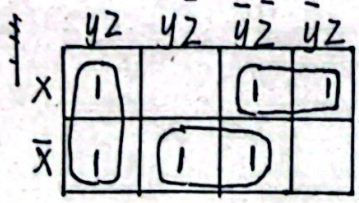




so: $\bar{x}z + x\bar{z} + x\bar{y}$ or $x\bar{z} + \bar{y}z + \bar{x}z$

is the minimal expansion

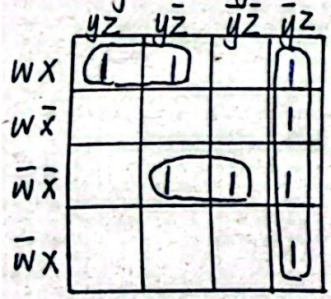
(d) $xyz + x\bar{y}z + x\bar{y}\bar{z} + \bar{x}yz + \bar{x}y\bar{z} + \bar{x}\bar{y}\bar{z}$:



so: $yz + x\bar{y} + \bar{x}\bar{z}$ is the minimal expansion

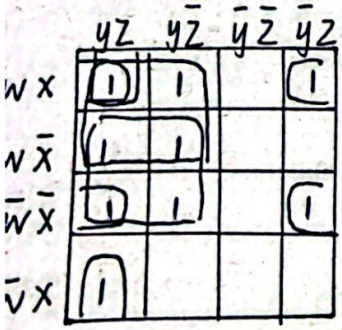
Ex.14

(c) $wxyz + wxy\bar{z} + wx\bar{y}z + w\bar{x}\bar{y}z + w\bar{x}\bar{y}\bar{z} + \bar{w}x\bar{y}z + \bar{w}\bar{x}y\bar{z} + \bar{w}\bar{x}\bar{y}z$



so: $wxy + \bar{y}z + \bar{w}\bar{x}\bar{z}$ is the minimal expansion

d) $wxyz + wxy\bar{z} + wx\bar{y}z + w\bar{x}yz + w\bar{x}y\bar{z} + \bar{w}xyz + \bar{w}\bar{x}yz + \bar{w}x\bar{y}z + \bar{w}\bar{x}\bar{y}\bar{z}$



so: $\bar{x}y + wy + wxz + \bar{w}\bar{x}\bar{z} + \bar{w}yz$ is the minimal expansio

(b) ~~$xy + x\bar{y}$~~:

Term	Bit String	Number of 1s
~~xy~~	~~11~~	
~~$x\bar{y}$~~	~~10~~	

(b) $wx\bar{y}\bar{z} + w\bar{x}yz + w\bar{x}y\bar{z} + w\bar{x}\bar{y}\bar{z} + \bar{w}x\bar{y}\bar{z} + \bar{w}\bar{x}y\bar{z} + \bar{w}\bar{x}\bar{y}\bar{z}$

Term		Term	Bit string	Number of 1s
~~$wx\bar{y}\bar{z}$~~	1.	$w\bar{x}yz$	1011	3
~~$w\bar{x}yz$~~	2	$wx\bar{y}\bar{z}$	1100	2
	3	$w\bar{x}y\bar{z}$	1010	2
	4	$w\bar{x}\bar{y}\bar{z}$	1000	2
	5	$\bar{w}x\bar{y}\bar{z}$	0100	1
	6	$\bar{w}\bar{x}y\bar{z}$	0010	1
	7	$\bar{w}\bar{x}\bar{y}\bar{z}$	0000	0

Step 1:

Term	String
~~5) $w\bar{x}y$~~	~~101-~~
~~5) $x\bar{y}\bar{z}$~~	~~-100~~
~~6) $\bar{x}y\bar{z}$~~	~~-010~~
~~7) $\bar{x}\bar{y}\bar{z}$~~	~~-000~~

Step 1:

Term	String
(1,3) $w\bar{x}y$	101-
(2,4) $w\bar{y}\bar{z}$	1-00
(2,5) $x\bar{y}\bar{z}$	-100
(3,6) $\bar{x}y\bar{z}$	-010
(4,7) $\bar{x}\bar{y}\bar{z}$	-000
(5,7) $\bar{w}\bar{y}\bar{z}$	0-00
(6,7) $\bar{w}\bar{x}\bar{z}$	00-0

Step 2:

Term	String
(2,4,5,7) $\bar{y}\bar{z}$	--00
~~(3,6) $\bar{x}y$~~	~~-01-~~
(3,4,6,7) $\bar{x}\bar{z}$	-0-0

It is clear that: the minimal expansion is:

$$\bar{y}\bar{z} + \bar{x}\bar{z} + w\bar{x}y$$

~~$\bar{y}\bar{z}$~~ ~~$\bar{x}\bar{z}$~~ ~~xy~~

Ex.32. The minimal expansion is: $w\bar{y} + \bar{w}x$

Section 13.1

Ex.6

(a) $S \to AB$, $A \to ab$, $B \to bb$, so the language is $\{abbb\}$

(b) $S \to AB$, $S \to aA$, $A \to a$, $B \to ba$, so the language is $\{aba, aa\}$

Ex.16

(a) $\{1^n \mid n \geq 0\}$: $S \to 1S$, $S \to \lambda$

(b) $\{10^n \mid n \geq 0\}$: $S \to 1OS$, * $S \to \lambda$

Ex.32.

<lletter> ::= a|b|c|d|···|z

<uletter> ::= A|B|C|D|···|Z

<letter> ::= <lletter> | <uletter>

<string> ::= <letter> | <string><letter>

<firstname> ::= <uletter> | <uletter>string

<middleinitial> ::= <lletter>

<lastname> ::= <uletter>string

<person> ::= <firstname><middleinitial><lastname>