Keith A. Kuntz
CS 42
Assig. 2

1) $\overline{XYZ} = \overline{X} + \overline{Y} + \overline{Z}$

X	Y	Z	XYZ	$\overline{XYZ}$	$\overline{X}$	$\overline{Y}$	$\overline{Z}$	$\overline{X}+\overline{Y}+\overline{Z}$
0	0	0	0	1	1	1	1	1
0	0	1	0	1	1	1	0	1
0	1	0	0	1	1	0	1	1
0	1	1	0	1	1	0	0	1
1	0	0	0	1	0	1	1	1
1	0	1	0	1	0	1	0	1
1	1	0	0	1	0	0	1	1
1	1	1	1	0	0	0	0	0

2) $\overline{A}B + \overline{B}\overline{C} + AB + \overline{B}C = 1$

$(AB + \overline{A}B) + (\overline{B}\overline{C} + \overline{B}C) = 1$

$B(A+\overline{A}) + \overline{B}(\overline{C}+C) = 1$

$B + \overline{B} = 1$

$1 = 1$

3) $Y + \overline{X}Z + X\overline{Y} = X + Y + Z$

$= Y + X\overline{Y} + \overline{X}Z$ (Dist. Prop.)

$= (Y + X)(Y + \overline{Y}) + \overline{X}Z$ $(A+BC = (A+B)(A+C))$

$= Y + X + \overline{X}Z$ (Dist. Prop)

$= Y + (X+\overline{X})(X+Z)$ $(A+BC = (A+B)(A+C))$

$= Y + X + Z$

$= X + Y + Z$

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4) $(XY+Z)(Y+XZ) = F$

X	Y	Z	XY	XZ	XY+Z	XZ+Y	F
0	0	0	0	0	0	0	0
0	0	1	0	0	1	0	0
0	1	0	0	0	0	1	0
0	1	1	0	0	1	1	1
1	0	0	0	0	0	0	0
1	0	1	0	1	1	1	1
1	1	0	1	0	1	1	1
1	1	1	1	1	1	1	1

$\Sigma m(3,5,6,7) = \bar{X}YZ + X\bar{Y}Z + XY\bar{Z} + XYZ$

$\Pi M(0,1,2,4) = (X+Y+Z)(X+Y+\bar{Z})(X+\bar{Y}+Z)(\bar{X}+Y+Z)$

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5) $wx\bar{y} + wx\bar{z} + wxz + y\bar{z} = F$

w x y z	$\bar{y}\,\bar{z}$	$wx\bar{y}$	$wx\bar{z}$	wxz	$y\bar{z}$	F	
0 0 0 0	1 1	0	0	0	0	0	0
0 0 0 1	1 0	0	0	0	0	0	1
0 0 1 0	0 1	0	0	0	1	1	2
0 0 1 1	0 0	0	0	0	0	0	3
0 1 0 0	1 1	0	0	0	0	0	4
0 1 0 1	1 0	0	0	0	0	0	5
0 1 1 0	0 1	0	0	0	1	1	6
0 1 1 1	0 0	0	0	0	0	0	7
1 0 0 0	1 1	0	0	0	0	0	8
1 0 0 1	1 0	0	0	0	0	0	9
1 0 1 0	0 1	0	0	0	1	1	10
1 0 1 1	0 0	0	0	0	0	0	11
1 1 0 0	1 1	1	1	0	0	1	12
1 1 0 1	1 0	1	0	1	0	1	13
1 1 1 0	0 1	0	1	0	1	1	14
1 1 1 1	0 0	0	0	1	0	1	15

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

$$= \bar{w}\bar{x}y\bar{z} + \bar{w}xy\bar{z} + w\bar{x}y\bar{z} + wx\bar{y}\bar{z} + wx\bar{y}z + wxy\bar{z} + wxyz$$

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

$$= (w+x+y+z)(w+x+y+\bar{z})(w+x+\bar{y}+\bar{z})(w+\bar{x}+y+z)(w+\bar{x}+y+\bar{z})(w+\bar{x}+\bar{y}+\bar{z})(\bar{w}+x+y+z)(\bar{w}+x+y+\bar{z})(\bar{w}+x+\bar{y}+\bar{z})$$

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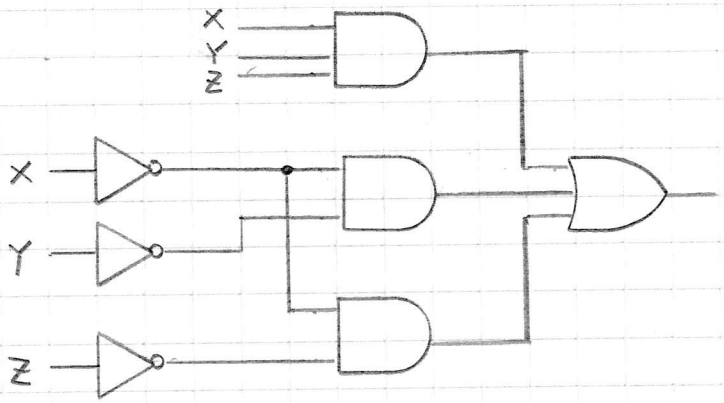
6) $XYZ + \bar{X}\bar{Y} + \bar{X}\bar{Z}$



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