MATH 151

Boolean Algebra

Lecture 10

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- $\overline{xy} = \bar{x} + \bar{y}$
- $\overline{x+y} = \bar{x}\,\bar{y}$
- $x + \bar{x} = 1$
- $x\,\bar{x} = 0$
- $x + x = x$
- $x\,x = x$
- $\overline{\bar{x}} = x$
- $CPS(f) = \overline{CSP(\bar{f})}$

Exercise 1: Find the **CSP** form of $f(x,y,z) = \bar{x}(y + \bar{z})$

Exercise 2: Find the **CSP** form of $f(x,y,z) = x(y + \bar{z})$

Exercise 3: Find the **CSP** form of $f(x,y,z)=(x\bar{y}+z)(\bar{x}+\bar{y})$

Exercise 4: Find the **CSP** form of $f(x,y,z)=(xy+z)(xz+\bar{y})$

Exercise 5: Find the **CSP** form of $f(x,y,z)=(x+y)(\bar{y}+z)$

Exercise 6: Find the **CSP** form of $f(x,y,z)=(x+y)(\bar{y}+z)+\bar{y}z$

Exercise 7: Find the **CPS** form of $f(x,y,z) = \bar{x}y + \bar{z}$

Exercise 8: Find the **CPS** form of $f(x,y,z) = x\bar{y} + z$

Exercise 9: Find the **CPS** form of $f(x,y,z) = \overline{xz + \bar{y}z}$

Exercise 10: Find the **CPS** form of $f(x,y,z) = \bar{x} + \bar{y}z$

Exercise 11: Find the **CPS** form of $f(x,y,z) = \overline{x}(y+z) + x\overline{y}$

Exercise 12: Find the **CPS** form of $f(x,y,z) = \overline{x + \overline{x}\ \overline{y}z}$

Exercise 13: Let g be the Boolean function represented by k-map below. Write g in **MSP** form

	zw	$z\bar{w}$	$\bar{z}\,\bar{w}$	$\bar{z}w$
xy	1	1	1	0
$x\bar{y}$	1	0	0	1
$\bar{x}\,\bar{y}$	0	1	1	0
$\bar{x}y$	0	1	1	0

Exercise 14: Let g be the Boolean function represented by k-map below. Write g in **MSP** form

	zw	$z\bar{w}$	$\bar{z}\,\bar{w}$	$\bar{z}w$
xy	**1**	**1**	**0**	**0**
$x\bar{y}$	**1**	**1**	**1**	**1**
$\bar{x}\,\bar{y}$	**0**	**1**	**0**	**0**
$\bar{x}y$	**0**	**1**	**0**	**0**

Exercise 15: Let g be the Boolean function represented by k-map below. Write g in **MSP** form

	zw	$z\bar{w}$	$\bar{z}\,\bar{w}$	$\bar{z}w$
xy	**1**	**0**	**1**	**1**
$x\bar{y}$	**1**	**0**	**0**	**1**
$\bar{x}\,\bar{y}$	**0**	**0**	**0**	**0**
$\bar{x}y$	**1**	**1**	**0**	**0**

Exercise 16: Let g be the Boolean function represented by k-map below. Write g in **MSP** form

	zw	$z\bar{w}$	$\bar{z}\,\bar{w}$	$\bar{z}w$
xy	**1**	**0**	**1**	**1**
$x\bar{y}$	**0**	**0**	**0**	**0**
$\bar{x}\,\bar{y}$	**0**	**0**	**0**	**0**
$\bar{x}y$	**1**	**1**	**1**	**1**