Boolean Algebra, K Map

Module 5

9/18/2023

1 Boolean algebra

Logic is represented by boolean equations. As with any equation, there exists simplification.

- allows for simplification methods
- Leads to smaller logic cicuits

Laws of AND & OR

$xx' = 0 \quad x1 = x \quad x0 = 0 \quad xx = x$
$x + x' = 1 \quad x + 1 = 1 \quad x + 0 = x \quad x + x = x$

Communitive

x+y=y+x
xy=yx

Associative

x + (y + z) = (x + y) + z
x(yz) = (xy)z

distributive

$$x(y + z) = xy + xz$$

$$(x + y) * (x + z)$$
$$xx + xz + xy + yz$$
$$x(1 + 1z + 1y) + yz$$
$$x + yz$$

Absorption

$$X + XY = X + Y$$

$$X' + XY = X' + Y$$

De Morgan's Law

$$\bar{A}\bar{B} = \bar{A} + \bar{B}$$