Boolean Algebra Rules

A + 0 = A
A + 1 = 1
A x 0 = 0
A x 1 = A
A + A = A
A + A' = 1
A x A = A
A x A' = 0
A'' = A
A + A'B = A + B
A + AB = A(1+B) = A(1) = A
(A+B)(A+C) = A+BC
A + B = B + A
AB = BA
A+B+C = A+(B+C)
A(B+C) = AB+AC

Laws

Communative Law	A x B = B x A
	A + B = B + A
Associative Law	A x (B x C) = (A x B) x C
	A + (B + C) = (A + B) +C
Distributive Law	A x (B + C) = A x B + A x C
	A + B x C = (A+B)(A+C)

DeMorgan Rules

(AB)' = A' + B'
(A+B)' = A'B'
Y' = A' x B x C
Y = (A' x B x C)'
Y = A x B' x C'
(A x B x C)' = A' + B' + C'
(A + B + C)' = A' x B' x C'

Theorems

Theorem 1	$X + X \cdot Y = X$
Theorem 2	$X + X' \cdot Y = X + Y$
Theorem 3	$X \cdot Y + X' \cdot Z + Y \cdot Z = X \cdot Y + X' \cdot Z$
Theorem 4	$X(X + Y) = X$
Theorem 5	$X(X' + Y) = X \cdot Y$
Theorem 6	$(X + Y)(X + Y') = X$
Theorem 7	$(X + Y)(X' + Z) = X \cdot Z + X' \cdot Y$
Theorem 8	$(X + Y)(X' + Z)(Y + Z) = (X + Y)(X' + Z)$

Binary & Gray Code

Decimal numbers	Binary code	Gray code
0	0000	0000
1	0001	0001
2	0010	0011
3	0011	0010
4	0100	0110
5	0101	0111
6	0110	0101
7	0111	0100
8	1000	1100
9	1001	1101
10	1010	1111
11	1011	1110
12	1100	1010
13	1101	1011
14	1110	1001
15	1111	1000