

Laws and Rule of Boolean Algebra

- Commutative Laws:-

- The Commutative Law of addition for two variable.

$$A + B = B + A$$

- The Commutative Law of multiplication for two variable.

$$A \cdot B = B \cdot A$$

- Associative Laws:-

- The Associative law of addition is written as

$$A \cdot (B + C) = A \cdot B + A \cdot C$$

- The Associative law of multiplication is written as

$$A \cdot (B \cdot C) = (A \cdot B) \cdot C$$

- Distributive Law:-

$$A \cdot (B + C) = A \cdot B + A \cdot C$$

BOOLEAN ALGEBRA

AND rules

$$A \cdot A = A$$

$$\overline{A} \cdot A = 0$$

$$0 \cdot A = 0$$

$$1 \cdot A = A$$

$$A \cdot B = B \cdot A$$

$$A \cdot (B \cdot C) = (A \cdot B) \cdot C$$

$$A \cdot (B + C) = A \cdot B + A \cdot C$$

$$\overline{A \cdot B} = \overline{A} + \overline{B}$$

“ Proof ”:

A	B	C	$A \cdot (B+C)$	$A \cdot B + A \cdot C$
0	0	0	0	0
0	0	1	0	0
0	1	0	0	0
0	1	1	0	0
1	0	0	0	0
1	0	1	1	1
1	1	0	1	1
1	1	1	1	1

BOOLEAN ALGEBRA ... continued

OR rules

$$A + A = A$$

$$\overline{A + A} = 1$$

$$0 + A = A$$

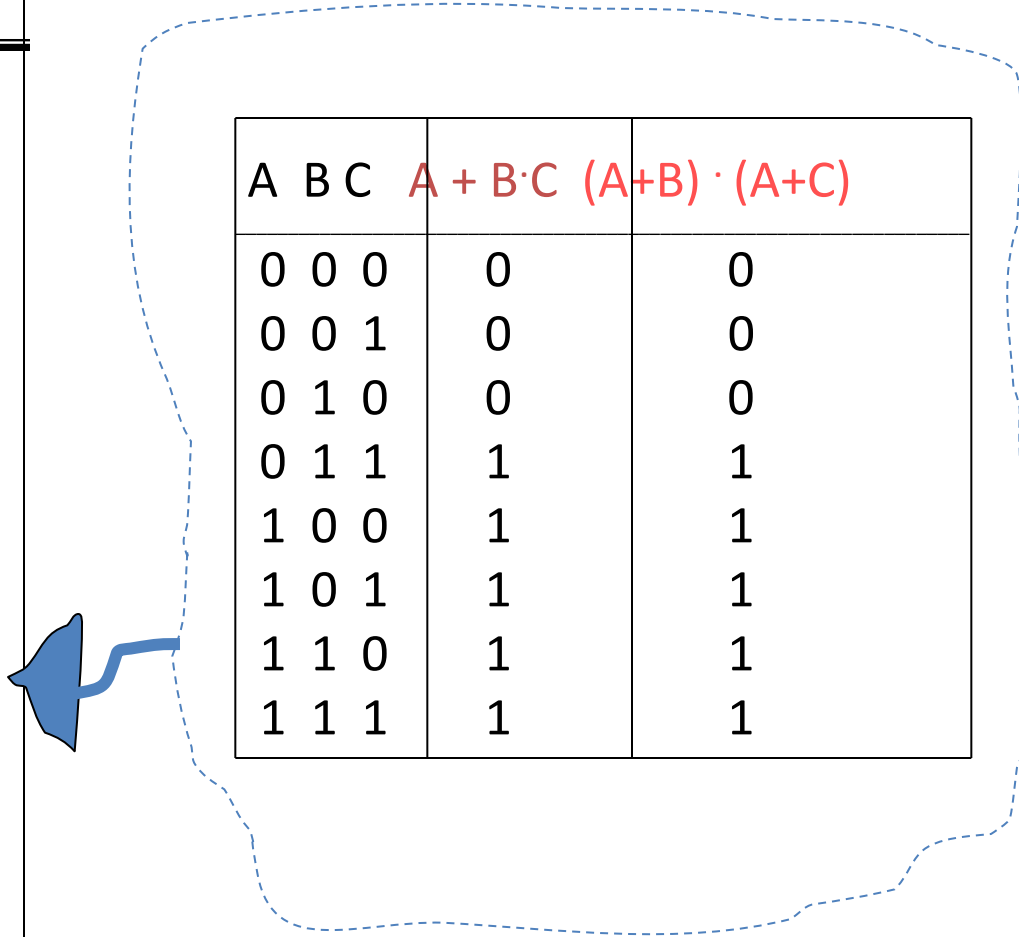
$$1 + A = 1$$

$$A + B = B + A$$

$$A + (B + C) = (A + B) + C$$

$$A + B \cdot C = (A + B) \cdot (A + C)$$

$$\overline{A} + \overline{B} = \overline{A \cdot B}$$



A	B	C	$A + B \cdot C$	$(A+B) \cdot (A+C)$
0	0	0	0	0
0	0	1	0	0
0	1	0	0	0
0	1	1	1	1
1	0	0	1	1
1	0	1	1	1
1	1	0	1	1
1	1	1	1	1