

## BOOLEAN LAWS AND THEOREMS

- Law of Identity

$$A = A$$
$$\bar{\bar{A}} = A$$

- Double Negative Law

$$\bar{\bar{A}} = A$$

- Idempotent Law

$$A \cdot A = A$$
$$A + A = A$$

- Complementary Law

$$A \cdot \bar{A} = 0$$
$$A + \bar{A} = 1$$

- Law of Intersection

$$A \cdot 1 = A$$
$$A \cdot 0 = 0$$

- Law of Union

$$A + 1 = 1$$
$$A + 0 = A$$

- Commutative Law

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

- Associative Law

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

- Law of Absorption

$$A + A \cdot B + A \cdot B \cdot C + \dots = A$$
$$A \cdot A + B \cdot A + B + C \cdot \dots = A$$

- Distributive Law

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

- De Morgan's Theorem

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

- Law of Common Identities

$$A \cdot (\bar{A} + B) = AB$$
$$A + (\bar{A} \cdot B) = A + B$$

- Simplification Theorem

$$A \cdot B + A \cdot \bar{B} = A$$
$$(A + B) \cdot (A + \bar{B}) = A$$