Bit Operations

CM0506 – Small Embedded Systems

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Lecture 4a

Boolean Algebra

The mathematics of logic, true/false, 1/0

Values are :

True	1	High
False	0	Low

Boolean Algebra

The mathematics of logic, true/false, 1/0

Values are :

True	1	High
False	0	Low

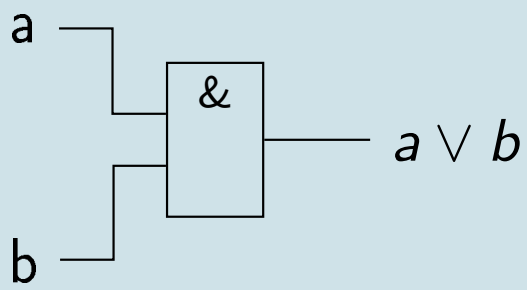
Operations are:

And	$a.b$	$a \vee b$
Or	$a + b$	$a \wedge b$
Not	$\bar{a}$	$\neg a$
Exclusive Or	$a \oplus b$	

And $a \vee b$

Truth Table

a	b	$a \vee b$
0	0	0
0	1	0
1	0	0
1	1	1



Identities

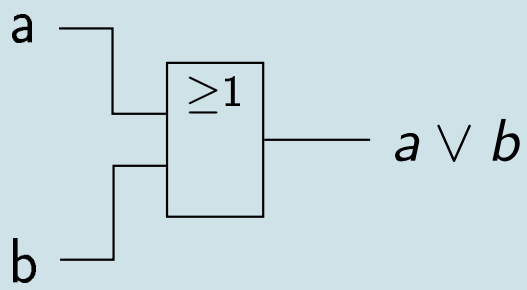
$$a \vee 0 = 0$$

$$a \vee 1 = a$$

Or $a \wedge b$

Truth Table

a	b	$a \wedge b$
0	0	0
0	1	1
1	0	1
1	1	1



Identities

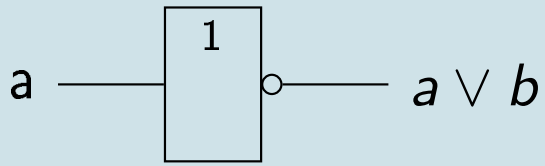
$$a \wedge 0 = a$$

$$a \wedge 1 = 1$$

Not $\neg a$

Truth Table

a	$\neg a$
0	0
1	1



Identities

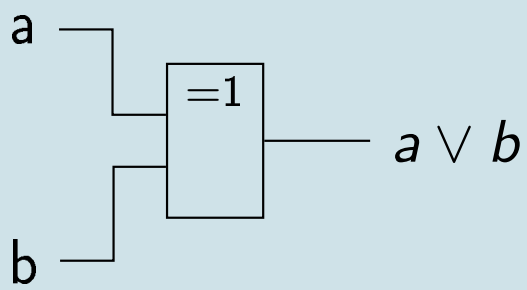
$$a \wedge 0 = a$$

$$a \wedge 1 = 1$$

Exclusive Or $a \oplus b$

Truth Table

a	b	$a \wedge b$
0	0	0
0	1	1
1	0	1
1	1	0



Identities

$$a \oplus 0 = a$$

$$a \oplus 1 = \neg a$$