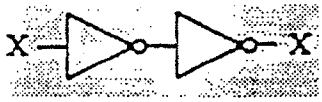
Basic Boolean Algebra Identities

OR	AND	name of identity
$X + 0 = X$	$X \cdot 1 = X$	identity
$X + 1 = 1$	$X \cdot 0 = 0$	null
$X + X = X$	$X \cdot X = X$	idempotence
$X + X' = 1$	$X \cdot X' = 0$	complementary
$X = X''$		involution
$X + Y = Y + X$	$X \cdot Y = Y \cdot X$	commutative
$X+(Y+Z) = (X+Y)+Z$	$X.(Y.Z) = (X.Y).Z$	associative
$X.(Y+Z) = X.Y + X.Z$	$X+Y.Z = (X+Y).(X+Z)$	distributive
$(X+Y)' = X' \cdot Y'$	$(X.Y)' = X' + Y'$	DeMorgan
NOR	NAND	

$X + X.Y = X$	$X.(X+Y) = X$	absorption*
$X+X'.Y = X + Y$	$X.(X'+Y) = X \cdot Y$	no name*

* can be derived from the basic identities

Decimal-Binary--Hexadecimal Table

Decimal	Binary	Hexa
0	0000	0
1	0001	1
2	0010	2
3	0011	3
4	0100	4
5	0101	5
6	0110	6
7	0111	7
8	1000	8
9	1001	9
10	1010	A
11	1011	B
12	1100	C
13	1101	D
14	1110	E
15	1111	F

Characteristic Tables

D Flip-Flop

D	Q^+
0	0
1	1

SR Flip-Flop

S	R	Q^+
0	0	Q memory
0	1	0 reset
1	0	1 set
1	1	?

JK Flip-Flop

J	K	Q^+
0	0	Q memory
0	1	0 reset
1	0	1 set
1	1	$\overline{Q}$ complement

Seven-Bit ASCII Character Codes

$A_6 A_5 A_4 A_3 / A_2 A_1 A_0$	000	001	010	011	100	101	110	111
0000	NUL	SOH	STX	ETX	EOT	ENQ	ACK	BEL
0001	BS	HT	LF	VT	FF	CR	SO	SI
0010	DLE	DC1	DC2	DC3	DC4	NAK	SYN	ETB
0011	CAN	EM	SUB	ESC	FS	GS	RS	US
0100	SP	!	"	#	$	%	&	'
0101	(	)	*	+	,	–	.	/
0110	0	1	2	3	4	5	6	7
0111	8	9	:	;	<	=	>	?
1000	@	A	B	C	D	E	F	G
1001	H	I	J	K	L	M	N	O
1010	P	Q	R	S	T	U	V	W
1011	X	Y	Z	[	\	]	^	_
1100	`	a	b	c	d	e	f	g
1101	h	i	j	k	l	m	n	o
1110	p	q	r	s	t	u	v	w
1111	x	y	z	{	|	}	~	DEL

Morse Code Alphabet

A •–	**N** –•	**0** –––––
B –•••	**O** –––	**1** •––––
C –•–•	**P** •––•	**2** ••–––
D –••	**Q** ––•–	**3** •••––
E •	**R** •–•	**4** ••••–
F ••–•	**S** •••	**5** •••••
G ––•	**T** –	**6** –••••
H ••••	**U** ••–	**7** ––•••
I ••	**V** •••–	**8** –––••
J •–––	**W** •––	**9** ––––•
K –•–	**X** –••–	**Fullstop** •–•–•–
L •–••	**Y** –•––	**Comma** ––••––
M ––	**Z** ––••	**Query** ••––••

Useful Properties and Numbers

$$\log_2(a) = \log(a)/\log(2);$$

$$\log_2(ab) = \log_2(a) + \log_2(b);$$

$$\log_2(1/a) = -\log_2(a);\ \ \log_2(2^k) = k$$

a	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
$\log_2(a)$	0.00	1.00	1.58	2.00	2.32	2.58	2.81	3.00
a	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
$\log_2(a)$	3.17	3.32	3.46	3.58	3.70	3.81	3.91	4.00

USPS Codes

Digit	**Code**		**Digit**	**Code**	
1	00011		6	01100	
2	00101		7	10001	
3	00110		8	10010	
4	01001		9	10100	
5	01010		0	11000	

Bar code used by the United States Postal Service. Taken from USPS Publications 63 – *Designing Flat Mail*, April 1993.