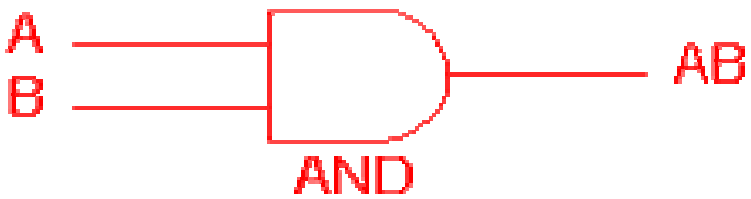
Logic
Applications : Digital Logic Circuits

Learning Outcomes

At the end of this lesson you will be able to learn how to design various logic circuits

Logic Gates

AND gate

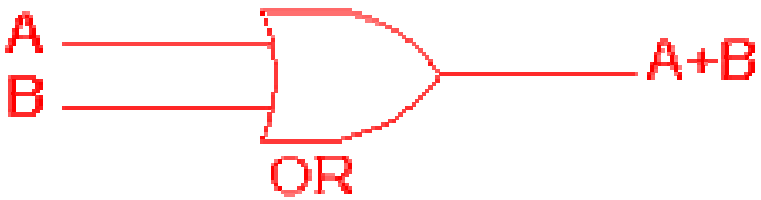


2 Input AND gate		
A	B	A.B
0	0	0
0	1	0
1	0	0
1	1	1

A dot (.) is used to show the AND operation i.e. A.B.

Logic Gates (Cont.)

OR gate

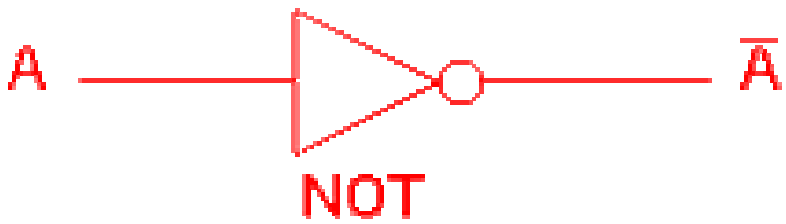


2 Input OR gate		
A	B	A+B
0	0	0
0	1	1
1	0	1
1	1	1

A plus (+) is used to show the OR operation i.e. A+B

Logic Gates (Cont..)

NOT gate

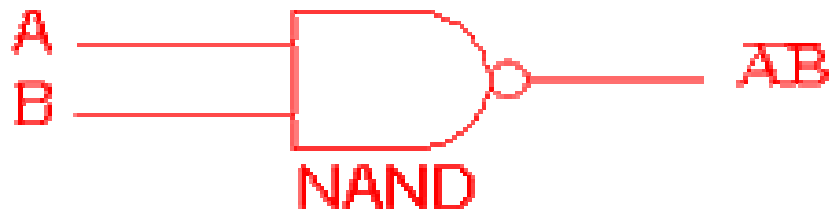


NOT gate	
A	$\overline{A}$
0	1
1	0

This is also shown as A', or A with a bar over the top

Logic Gates (Cont..)

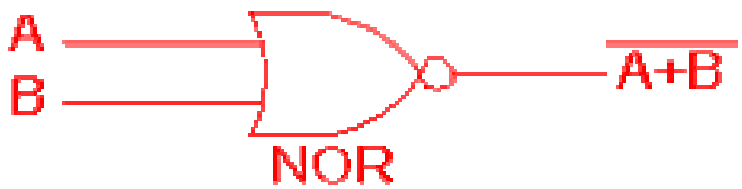
NAND gate



2 Input NAND gate		
A	B	$\overline{A.B}$
0	0	1
0	1	1
1	0	1
1	1	0

Logic Gates (Cont..)

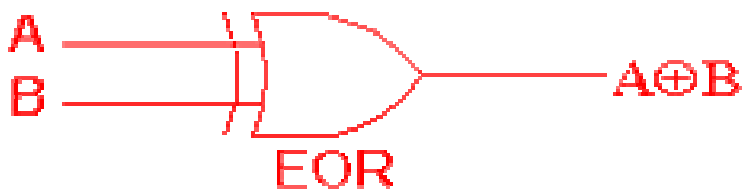
NOR gate



2 Input NOR gate		
A	B	$\overline{A+B}$
0	0	1
0	1	0
1	0	0
1	1	0

Logic Gates (Cont..)

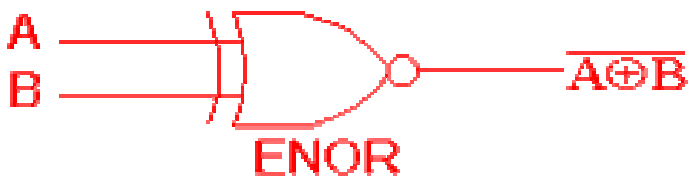
EXOR gate



2 Input EXOR gate		
A	B	A⊕B
0	0	0
0	1	1
1	0	1
1	1	0

Logic Gates (Cont..)

EXNOR gate



2 Input EXNOR gate		
A	B	$\overline{A \oplus B}$
0	0	1
0	1	0
1	0	0
1	1	1

Making Multiple Input Gates

Example:

3 Input AND gate			
A	B	C	A.B.C
0	0	0	0
0	0	1	0
0	1	0	0
0	1	1	0
1	0	0	0
1	0	1	0
1	1	0	0
1	1	1	1