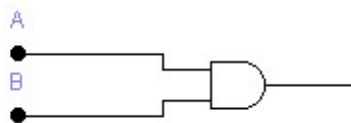


البوابات المنطقية

Logic Gates

1- بوابة AND

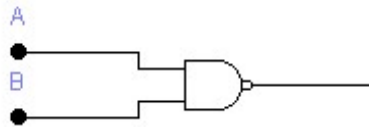


A	B	C
0	0	0
0	1	0
1	0	0
1	1	1

$$C = A \cdot B$$

$$C = AB$$

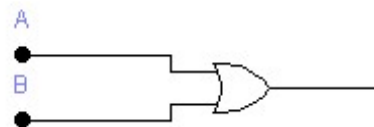
2- بوابة NAND



A	B	C
0	0	1
0	1	1
1	0	1
1	1	0

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

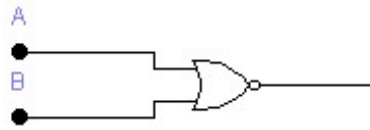
3- بوابة OR



A	B	C
0	0	0
0	1	1
1	0	1
1	1	1

$$C = A + B$$

4- بوابة NOR



A	B	C
0	0	1
0	1	0
1	0	0
1	1	0

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

5- بوابة NOT



A	B
0	1
1	0

$$B = \overline{A}$$

6- بوابة Exclusive OR (XOR)



A	B	C
0	0	0
0	1	1
1	0	1
1	1	0

$$C = A \oplus B$$

$$C = A\bar{B} + \bar{A}B$$

مثال بوابة XOR ذات المداخل الثلاث

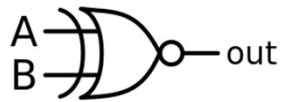
$$Y = A \oplus B \oplus C$$

A	B	C	Y	تسلسل الحالة
0	0	0	0	0
0	1	0	1	2
1	0	0	1	4
1	1	0	0	6
0	0	1	1	1
0	1	1	0	3
1	0	1	0	5
1	1	1	1	7

$$f(A, B, C) = \sum (1, 2, 4, 7)$$

حيث خرج الدائرة 1

7- بوابة Exclusive NOR (XNOR)



A	B	C
0	0	1
0	1	0
1	0	0
1	1	1

$$C = \overline{A \oplus B}$$

$$C = AB + \overline{AB}$$

امثلة

	ماهي قيمة y	
0	$y = 1.0.1$	$y = A.B.C$
1	$y = 1+0+1$	$y = A+B+C$
0	$y = 1 \oplus 0 \oplus 1$	$y = A \oplus B \oplus C$
1	$y = (1+0).1$	$y = (A+B).C$
0	$y = 0 + (1.0)$	$y = A + (B.C)$
1	$y = 1 + \bar{0} + (1.0)$	$y = A + \bar{B} + (A.C)$