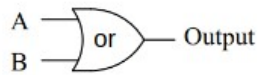


#### 4.1

ex1

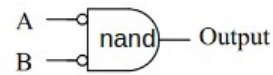
Identify each of these logic gates by name, and complete their respective truth tables:



A	B	Output
0	0	0
0	1	1
1	0	1
1	1	1



A	B	Output
0	0	0
0	1	0
1	0	0
1	1	1



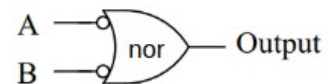
A	B	Output
0	0	1
0	1	1
1	0	1
1	1	0



A	B	Output
0	0	1
0	1	0
1	0	0
1	1	0



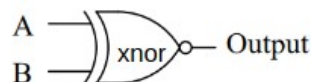
A	B	Output
0	0	1
0	1	1
1	0	1
1	1	0



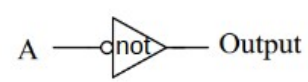
A	B	Output
0	0	1
0	1	0
1	0	0
1	1	0



A	B	Output
0	0	0
0	1	1
1	0	1
1	1	0



A	B	Output
0	0	1
0	1	0
1	0	0
1	1	1

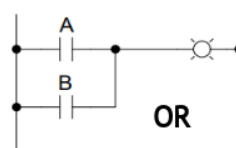


A	Output
0	1
1	0

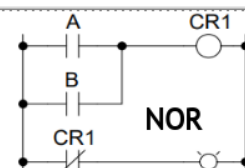
ex2



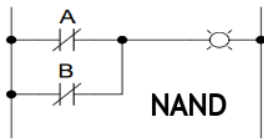
A	B	Output
0	0	0
0	1	0
1	0	0
1	1	1



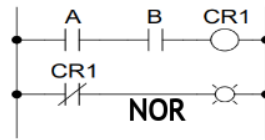
A	B	Output
0	0	0
0	1	1
1	0	1
1	1	1



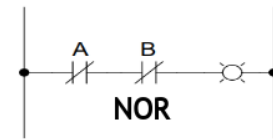
A	B	Output
0	0	1
0	1	0
1	0	0
1	1	0



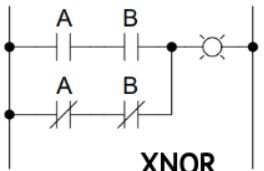
A	B	Output
0	0	1
0	1	1
1	0	1
1	1	0



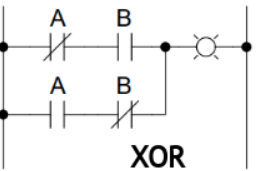
A	B	Output
0	0	1
0	1	0
1	0	0
1	1	0



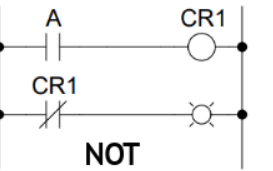
A	B	Output
0	0	1
0	1	0
1	0	0
1	1	0



A	B	Output
0	0	1
0	1	0
1	0	0
1	1	1



A	B	Output
0	0	0
0	1	1
1	0	1
1	1	0



A	Output
0	1
1	0

4.2  
ex.1

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

Complete the following Karnaugh map,  
according to the values found in the above truth table:

		C	
		0	1
AB	00	1	1
	01	0	1
	11	0	0
	10	0	1

ex.2

Here is a truth table for a specific four-input logic circuit. Complete the following Karnaugh map, according to the values found in the above truth table:

A	B	C	D	Out
0	0	0	0	0
0	0	0	1	1
0	0	1	0	0
0	0	1	1	0
0	1	0	0	0
0	1	0	1	1
0	1	1	0	0
0	1	1	1	0
1	0	0	0	0
1	0	0	1	1
1	0	1	0	1
1	0	1	1	1
1	1	0	0	0
1	1	0	1	1
1	1	1	0	0
1	1	1	1	1

		CD			
		00	01	11	10
AB	00	0	1	0	0
	01	0	1	0	0
	11	0	1	1	0
	10	0	1	1	1

ex.3

B and D stay the same while A and C are changing.

(01, 01) → A = 0, B = 1, C = 0, D = 1

(01, 11) → A = 0, B = 1, C = 1, D = 1

(11, 01) → A = 1, B = 1, C = 0, D = 1

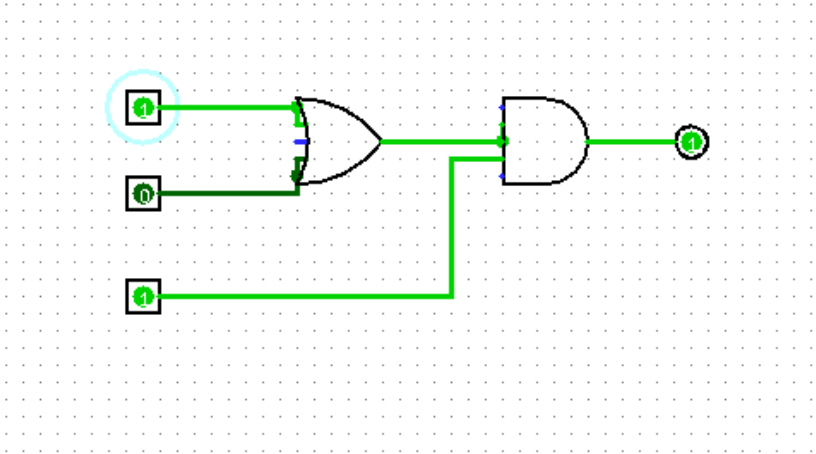
(11, 11) → A = 1, B = 1, C = 1, D = 1

ex.4

A	B	C	D	Output
0	0	0	0	0
0	0	0	1	0
0	0	1	0	0
0	0	1	1	0
0	1	0	0	0
0	1	0	1	0
0	1	1	0	1
0	1	1	1	0
1	0	0	0	0
1	0	0	1	0
1	0	1	0	1
1	0	1	1	1
1	1	0	0	0
1	1	0	1	0
1	1	1	0	1
1	1	1	1	1

CD/AB	00	01	11	10
00				
01				
11			1	1
10		1	1	1

$F=AC+BC = C(A+B)$

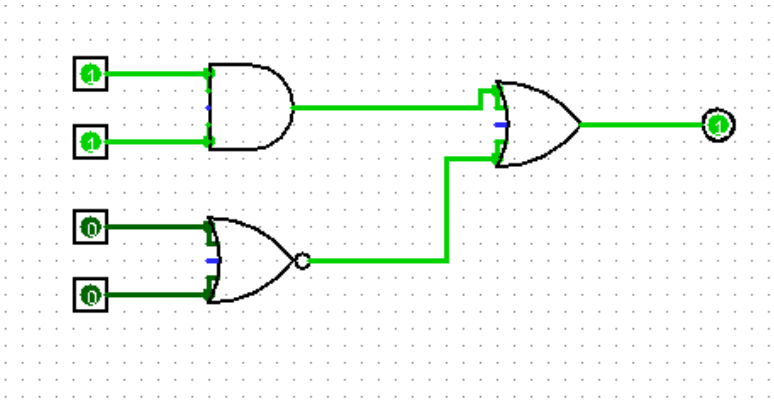


ex.5

A	B	C	D	Output
0	0	0	0	0
0	0	0	1	0
0	0	1	0	0
0	0	1	1	0
0	1	0	0	0
0	1	0	1	0
0	1	1	0	0
0	1	1	1	0
1	0	0	0	1
1	0	0	1	0
1	0	1	0	1
1	0	1	1	1
1	1	0	0	0
1	1	0	1	0
1	1	1	0	1
1	1	1	1	1

CD/AB	00	01	11	10
00				1
01				(BD)'
11			1	1
10			1	1

$F = AC + (BD)'$



ex.6

A	B	C	D	Output
0	0	0	0	1
0	0	0	1	0
0	0	1	0	0
0	0	1	1	0
0	1	0	0	1
0	1	0	1	0
0	1	1	0	1
0	1	1	1	0
1	0	0	0	1
1	0	0	1	0
1	0	1	0	0
1	0	1	1	0
1	1	0	0	1
1	1	0	1	0
1	1	1	0	1
1	1	1	1	0

CD/AB	00	01	11	10
00	1	1	1	1
01		(CD)'		
11			BCD'	
10		1	1	

$$F = (CD)' + BCD' = C'D' + BCD' = D'(C' + BC) =$$

$$C' + BC = (C' + B)(C' + C) = C' + B \quad \text{because } C' + C = 1$$

$$= D'(C' + B) = (CD)' + BD'$$

