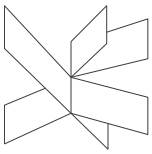

Mandatory Assignment

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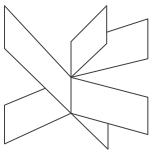

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1 From Boolean expression to truth table

1.1 Fill out the truth table from the following Boolean expression:

$Out = A\bar{B}\,\bar{C} + BC$

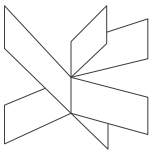
A	B	C	Out
0	0	0	0
0	0	1	0
0	1	0	0
0	1	1	1
1	0	0	1
1	0	1	0
1	1	0	0
1	1	1	1

ComboCtl 1

1.2 Fill out the truth table from the following Boolean expression:

$Out = \bar{B}$

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



1	0	1	1
1	1	0	0
1	1	1	0

1.3 Fill out the truth table from the following Boolean expression:

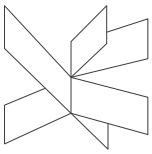
$Out = 1$

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

1.4 Fill out the truth table from the following Boolean expression:

$Out = C(A + B)$

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



1	0	1	1
1	1	0	0
1	1	1	1

1.5 Write down the truthtable from the following Boolean expression.

$Out = B(A + C) + \bar{B}\,\bar{C}\,\bar{A}$

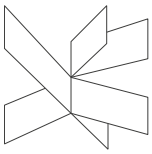
Solution

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

2 From truth table to Boolean expression

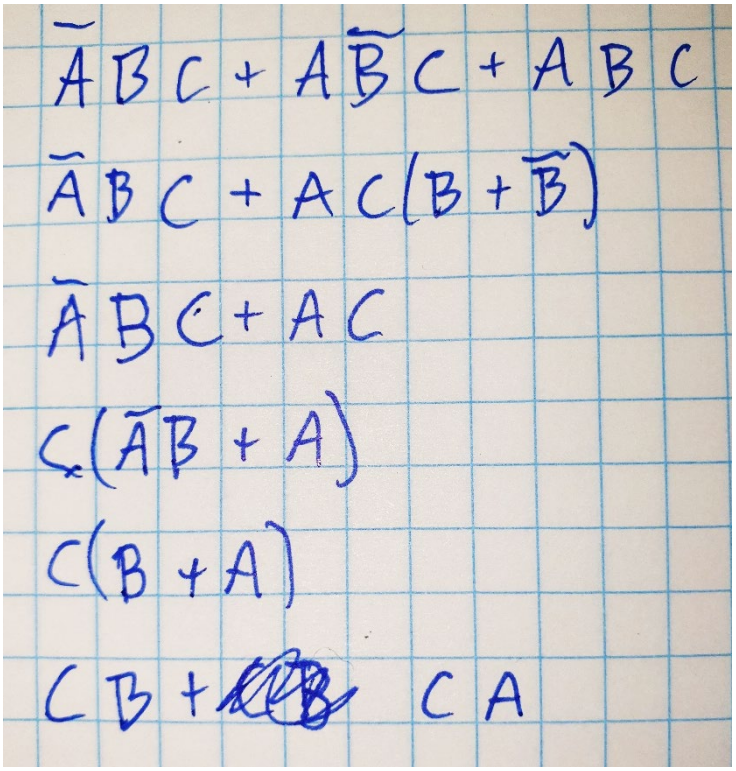
2.1 Write down the Boolean expression described by the truthtable and simplify it as much as possible.

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



0	1	0	0
0	1	1	1
1	0	0	0
1	0	1	1
1	1	0	0
1	1	1	1

SOLUTION

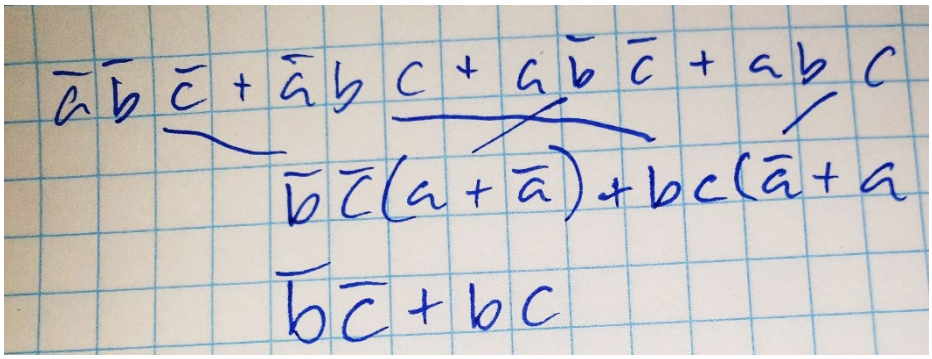


2.2 Write down the Boolean expression described by the truthtable and simplify it as much as possible.

A	B	C	Out
0	0	0	1

0	0	1	0
0	1	0	0
0	1	1	1
1	0	0	1
1	0	1	0
1	1	0	0
1	1	1	1

SOLUTION

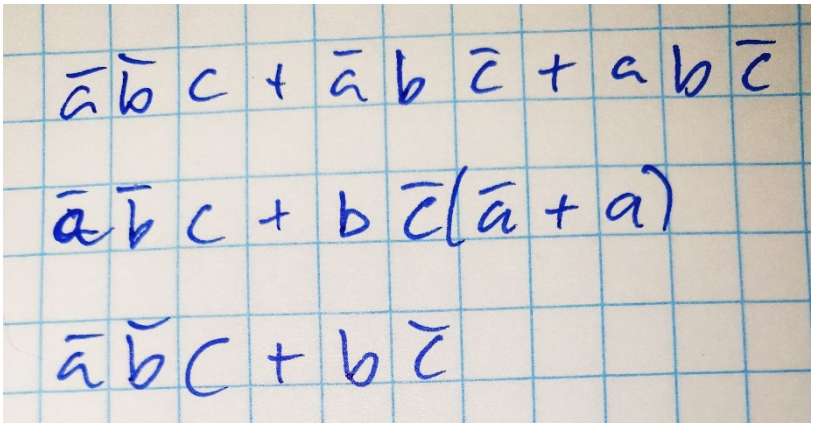


2.3 Write down the Boolean expression described by the truthtable and simplify it as much as possible.

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

1	1	1	0

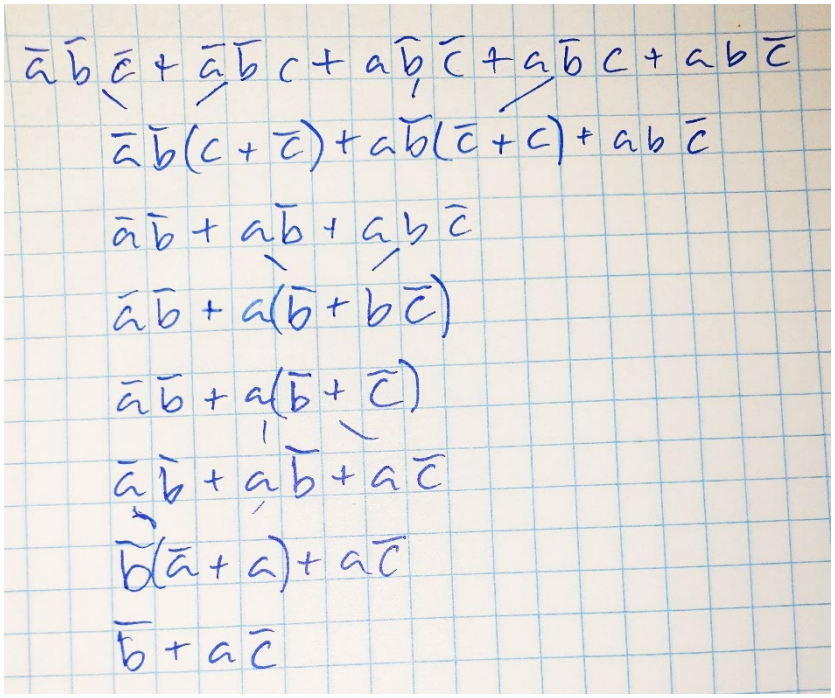
Solution



2.4 Write down the Boolean expression described by the truthtable and simplify it as much as possible.

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

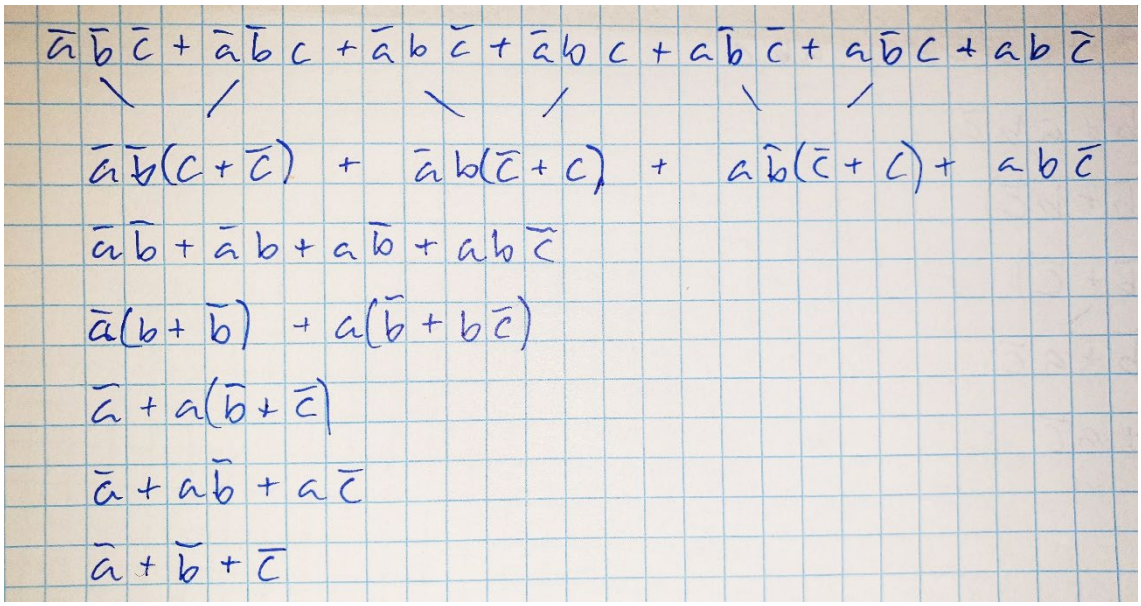
Solution



2.5 Write down the Boolean expression described by the truthtable and simplify it as much as possible.

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

Solution

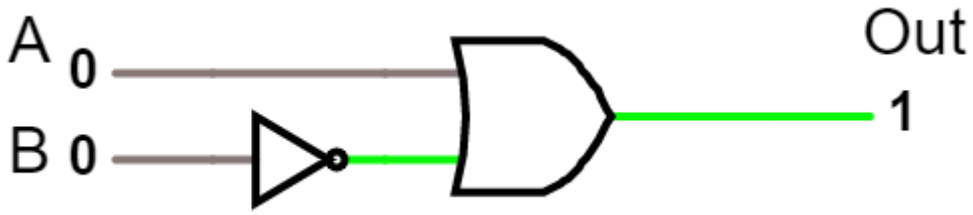


3 Boolean expression to circuit.

3.1 Draw the logic circuit described by the following Boolean expression

$Out = A + \bar{B}$

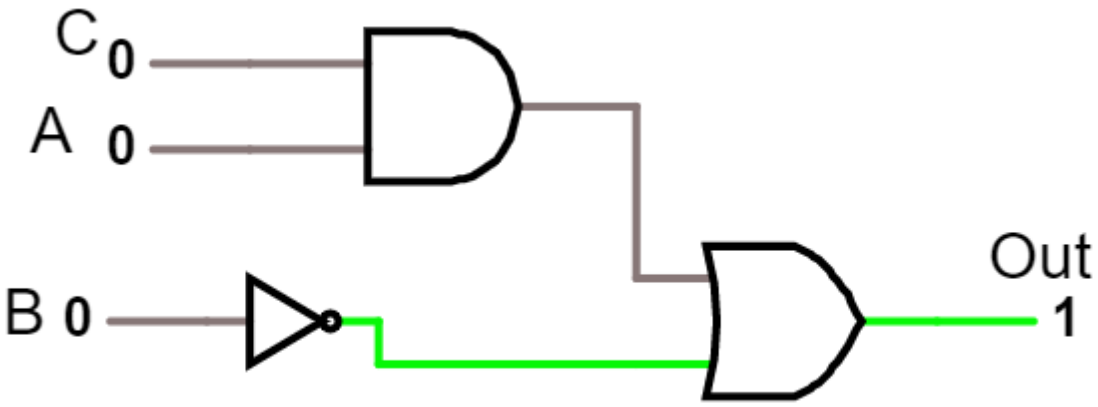
Solution



3.2 Draw the logic circuit described by the following Boolean expression

$Out = CA + \bar{B}$

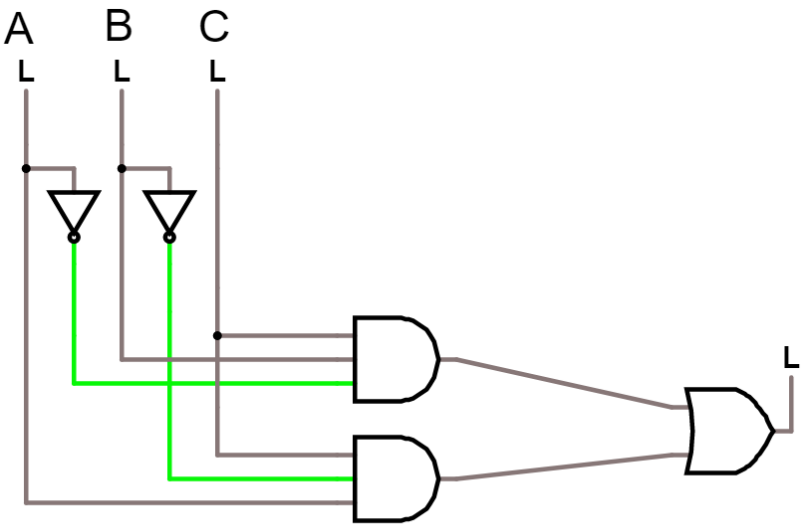
Solution



3.3 Draw the logic circuit described by the following Boolean expression

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

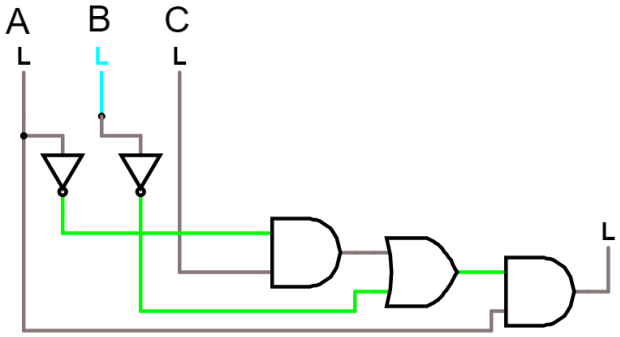
Solution



3.4 Draw the logic circuit described by the following Boolean expression

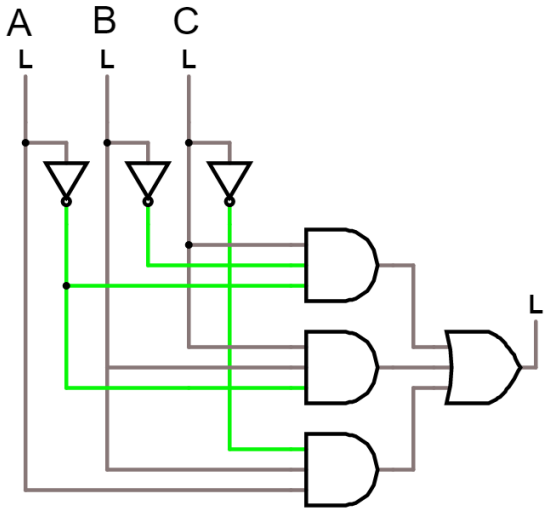
$Out = A(\bar{B} + \bar{A}\,C)$

Solution



4 From circuit to Boolean expression

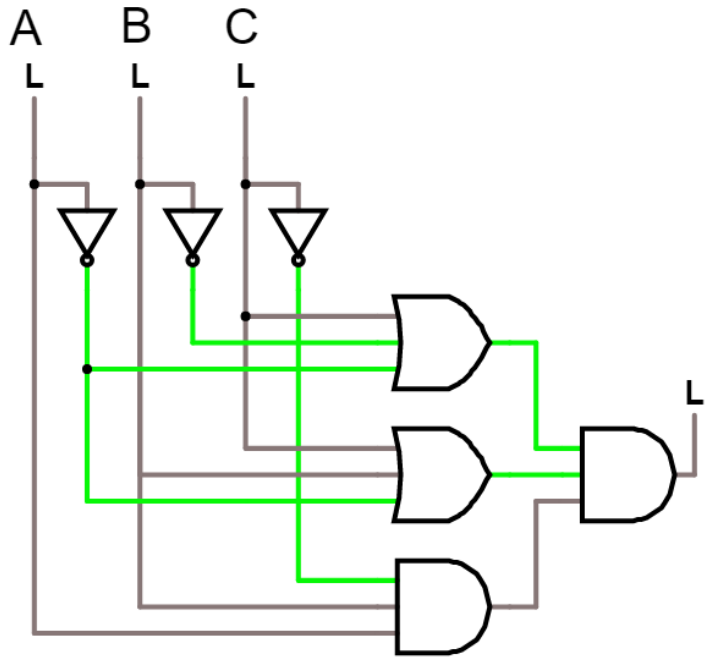
4.1 Write down the Boolean expression derived from the logical circuit below:



Solution

$\overline{A}\,\overline{B}C + \overline{A}BC + AB\overline{C}$

4.2 Write down the Boolean expression derived from the logical circuit below:

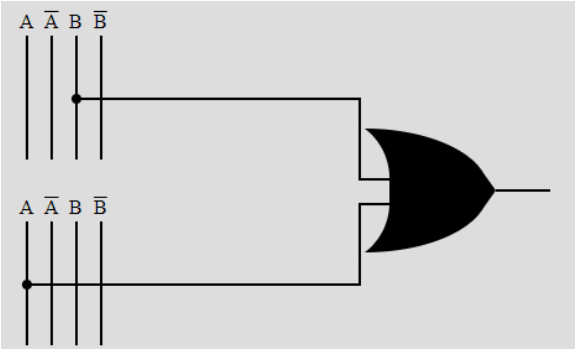


Solution

$(\bar{A} + \bar{B} + C)(\bar{A} + B + C)(AB\bar{C})$

5 From circuit to truth table

5.1 Write down the truthtable from the following circuit:

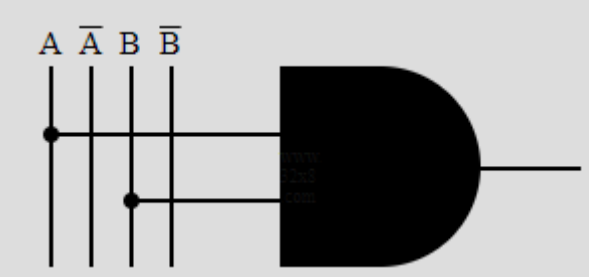


A	B	Out
0	0	
0	1	
1	0	
1	1	

Solution

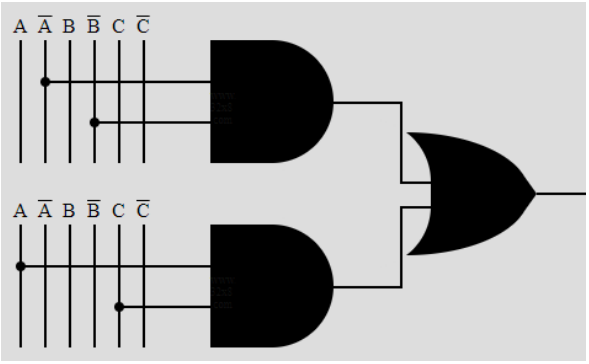
A	B	Y
0	0	0
0	1	1
1	0	1
1	1	1

5.2 Write down the truthtable from the following circuit:



Solution

A	B	Y
0	0	0
0	1	0
1	0	0
1	1	1

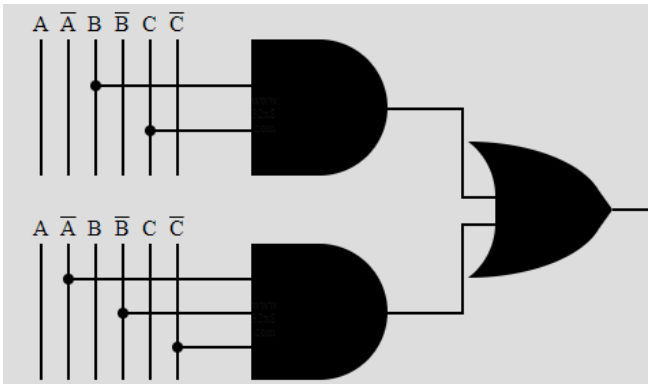


5.3 Write down the truthtable from the following circuit:

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

Solution

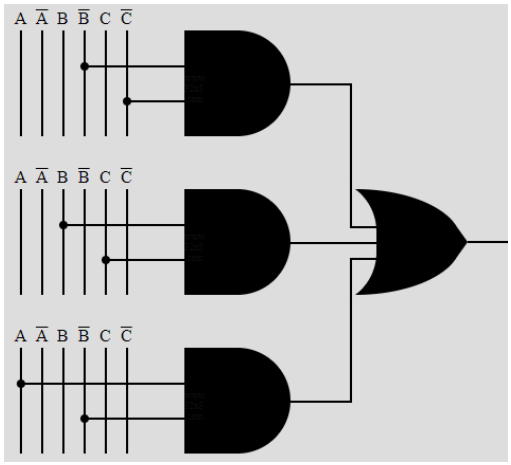
A	B	C	Y
0	0	0	1
0	0	1	1
0	1	0	0
0	1	1	0
1	0	0	0
1	0	1	1
1	1	0	0
1	1	1	1



5.4 Write down the truthtable from the following circuit:

Solution

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



5.5 Write down the truthtable from the following circuit:

Solution

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