

3-variable examples

1. Simplify the following expression using a Karnaugh map:

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

You may be able to tell what is going to happen by completing the truth table for this expression.

2. Simplify the following expression using a Karnaugh map:

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

From this expression, you can't complete the truth table or Karnaugh map directly. First, you need to convert the statement into **sum of products**, or **SOP** form:

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

3. Here is another expression to simplify:

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

Note that $\bar{A}.B$ has no C variable and fills two cells in the map. This condition is satisfied when $C=0$ and also when $C=1$.

- Write out the minimized Boolean Algebra Expression for each of the Karnaugh maps below.
- Construct Truth tables for each of the maps.

	ab			
cd	00	01	11	10
00	1		1	1
01	1			1
11				
10			1	

	ab			
cd	00	01	11	10
00	1	1		
01				
11	1			1
10	1	1		1

	ab			
cd	00	01	11	10
00	1			1
01				
11				
10	1			1