

example

In this problem we have three inputs, A, B and C, with one output, Z. From the truth table we can see that there are two occasions when the output goes to logic 1.

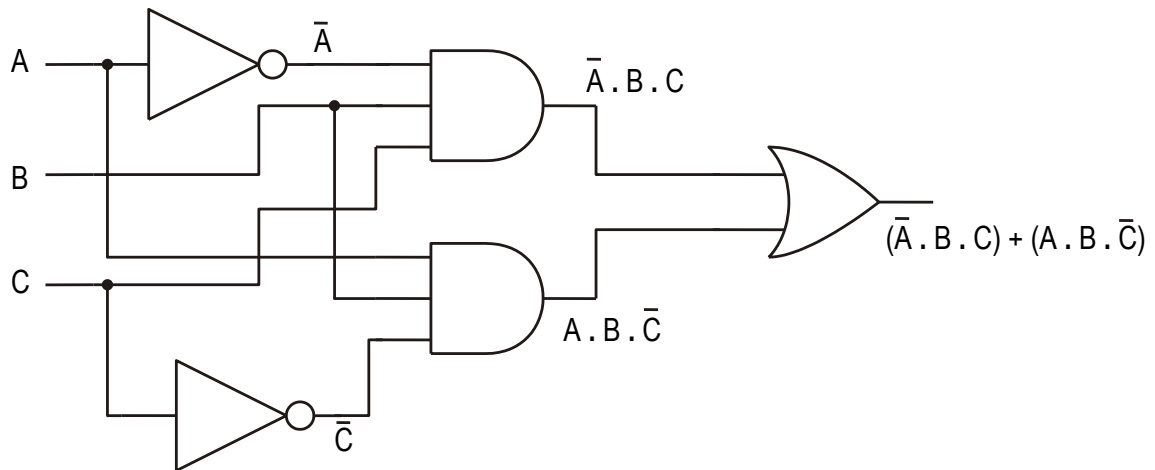
A	B	C	Z
0	0	0	0
0	0	1	0
0	1	0	0
0	1	1	1
1	0	0	0
1	0	1	0
1	1	0	1
1	1	1	0

$Z = \bar{A} \cdot B \cdot C$

$Z = A \cdot B \cdot \bar{C}$

In other words, $Z = 1$ if (A is at logic 1 AND B is at logic 1 AND C is at logic 1) OR if (A is at logic 1 AND B is at logic 1 AND C is at logic 0).

This means we need a two-input OR gate being fed from two three-input AND gates as shown below.



The shorthand Boolean equation for this truth table is

$$Z = (\bar{A} \cdot B \cdot C) + (A \cdot B \cdot \bar{C})$$