Logic Circuit of the Boolean Expression

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1 Problem:

Draw the Logic Circuit of the following Boolean Expression:

$$(U' + V).(V' + W') \tag{1}$$

2 Solution:

2.1 Theory:

The logic circuit of the Boolean expression is designed by using logical gates. The logic gates we use for the given boolean expression are NOT, AND, NOR gates. With the help of truth table and the expression, the logic circuit is designed.
By simplifying the given equation we get the following equation:

$$Y = (U'.V') + (V.W') \tag{2}$$

Therefore, from equation (2), we can say that there are two multiplications and an addition operations in solving the given equation. As a result, we use two AND gates for multiplication operations and a single OR gate for addition.

2.2 Truth Table:

U	V	W	Y
0	0	0	1
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

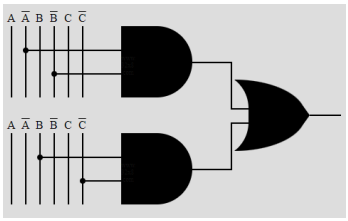

Figure 1: Logic circuit of the given boolean expression

3 Hardware:

3.1 Components:

Arduino UNO	1
Breadboard	1
Jumper wires	-

3.2 Connections:

Arduino UNO has LED connected to Pin 13. Let pins 6,7,8 be the inputs. Connect the input pin to Vcc, if it must be set to '1'. Connect the input pin to GND of arduino board, if it must be set to '0'. The LED will glow if the output is '1'.

4 Code:

This is the source code
Source code