

Verification of First Distributive law of Boolean Algebra

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Abstract—This document shows the verification of first distributive law of Boolean Algebra through Truth Table

I. STATEMENT

This law states that $X.(Y+Z) = X.Y + X.Z$

This law can be verified by the Truth table mentioned below:

| X | Y | Z | Y+Z | X.(Y+Z) | X.Y | X.Z | X.Y + X.Z |
|---|---|---|-----|---------|-----|-----|-----------|
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 |
| 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 |
| 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1 | 0 | 1 | 1 | 1 | 0 | 1 | 1 |
| 1 | 1 | 0 | 1 | 1 | 1 | 0 | 1 |
| 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |

TABLE I

1.1 TRUTH TABLE

II. COMPONENTS

| Component | Value | Qunatity |
|--------------|-------|----------|
| Arduino | UNO | 1 |
| Jumper Wires | M-M | 2 |
| BreadBoard | | 1 |
| LED | | 1 |

TABLE II

1.1 COMPONENTS

III. HARDWARE

Problem 2.2. Make connections between the Arduino UNO, and LED as shown in Table 2.1

| | | |
|---------|------|------|
| Arduino | 12 | GND |
| LED | + ve | - ve |

TABLE III

2.1 CONNECTIONS

IV. SOFTWARE

Problem 3.1 Now execute the following program and verify the outputs as mentioned in Table 3.1 by modifying the inputs X, Y, Z.

```
wget https://github.com/sureshoye/IDE-Assignment/blob/main/distributivelaw.cpp
```

TABLE IV

Note: You will observe that the light adjacent to PIN 13 and LED bulb glow together.