Verification of First Distributive law of Boolean Algebra in Assembly Language

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***Abstract*—This document shows the verification of first distributive law of Boolean Algerbra 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	7
BreadBoard		1
LED		2

TABLE II
1.1 Components

III. Hardware

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

Arduino	2	8	GND
LED 1	+ ve		- ve
LED 2		+ 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 2.1 by modifying the inputs X, Y, Z.

svn co https://github.com/sureshoye/Assembly-Assignment
cd Assembly-Assignment
cd trunk
cd codes
avra hello.asm
Connect the Arduino to the computer and type below
avrdude -P atmega328p -c arduino -P /dev/ttyACM0
-b 115200 -U flash:w:hello.hex

TABLE IV

Note: You will observe that both LED bulbs glow together.

Problem 3.2 Now execute the above program and verify the outputs by changing the last digits of r18,r19,r20,r21,r22,r23. Make sure that the inputs of r18 and r21 are same followed by r19 and r22, r20 and r22 with same values as they represent X,Y and Z