CSE260 Lab Report

Experiment 2 : Applications of Boolean Algebra.

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1. Experiment name: Applications of Boolean Algebra.

2. Objective: 1. To investigate the rules of Boolean algebra.

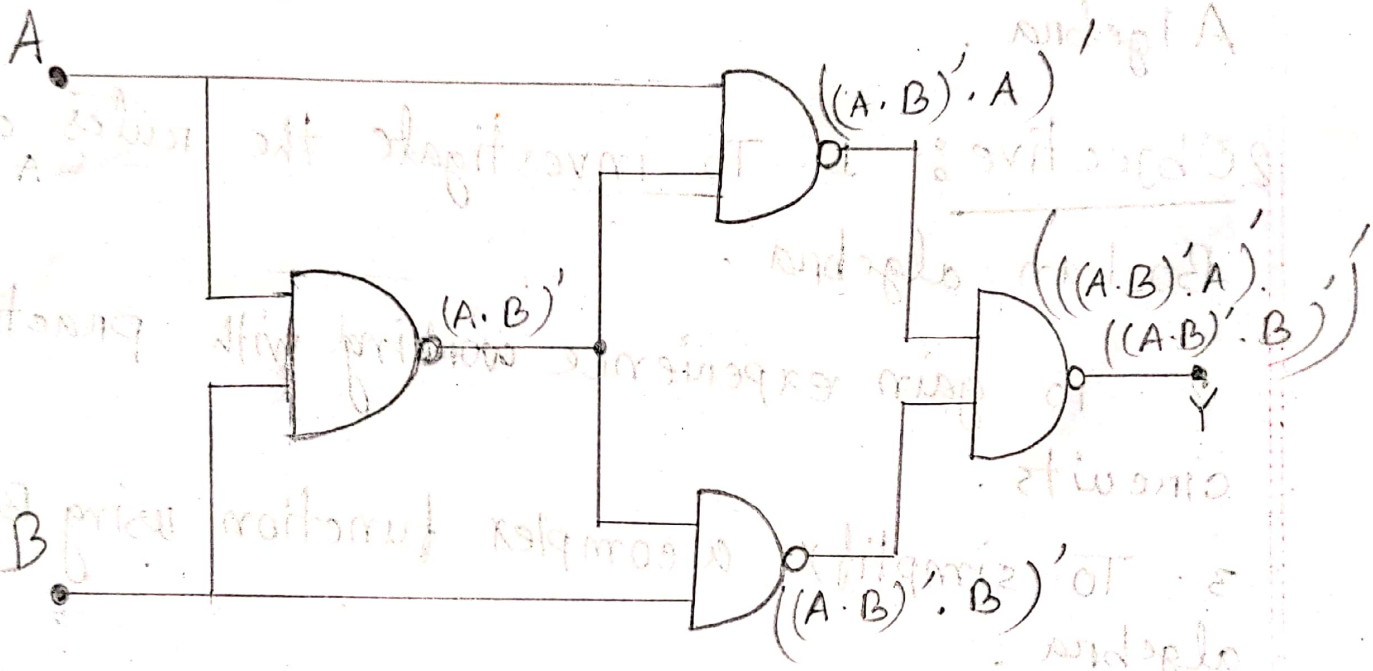
2. To gain experience working with practical circuits.

3. To simplify a complex function using Boolean algebra.

3. Required components and Equipments:

1. NAND Gate
2. Logic state (input)
3. Led - blue (output)
4. Ground.

4. Diagram of Circuit / Experimental setup:



5. Results and Discussions:

Input					output
A	B	(AB)'	(A(AB)')'	(B(AB)')'	Y
0	0	1	1	1	0
0	1	1	1	0	1
1	0	1	0	1	1
1	1	0	1	1	0

The Boolean equation of the output is,

$$\left((A(AB)')' \cdot (B(AB)')'\right)'$$

simplifying the boolean equation using De morgan's law,

$$\left((A(AB)')' \cdot (B(AB)')'\right)'$$

$$= \left((A(AB)')'\right)' + \left((B(AB)')'\right)' \quad [(AB)' = A' + B']$$

$$= A(AB)' + B(AB)' \quad [A'' = A]$$

$$= A(A' + B') + B(A' + B')$$

$$= (A \cdot A') + (AB') + (A'B) + (B \cdot B') \quad [A \cdot \bar{A} = 0]$$

$$= AB' + A'B$$

$$= A \oplus B$$

∴ This is the simplified Boolean equation.

The circuits function output represents XOR gate. Hence, it is identical to X-OR gate.