Design of XNOR Gate Using NOR Gates

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Abstract

We can able to design all other gates using the pair Universal gates i.e;(NAND and NOR).This document is to understand the behavior and demonstrate the Implementation of XNOR Gate using NOR gate.

1 Components

Component	Value	Quantity
bread board	-	1
led	-	1
Arduino	-	1
Jumper Wires	M-M	2

Table 1:

2 XNOR Truth Table

A	B	G(A,B)
0	0	1
0	1	0
1	0	0
1	1	1

Table 2:

3 Circuit Diagram
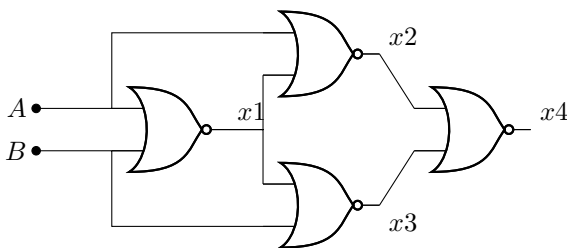
Figure 1

4 Boolean Logic

x1=(A+B)'
x2=(A+(A+B)')'
x3=(B+(A+B)')'
x4=(A.B)+(A'.B')

5 Hardware

Arduino	D13	GND
Led	+VE	-VE

Table 3:

6 Hardware Connection

Give the connections as per Table 3. For taking the inputs connect 5V of arduino to +ve line of bread board to consider it as logic 'HIGH'.Connect GND pin of arduino to -ve line of bread board to consider it as logic 'LOW'.

For example if the inputs A,B are connected 1,0 respectively the output should be 0 i.e., the LED connected to the 13th pin should turn off.

In the another case if we connect the inputs A,B to 1,1 respectively the output should be 1 i.e., the LED connected to 13th pin should glow.

The circuit implementation of the above function is given in figure 1.

7 Software

1.Connect the arduino to the USB port of computer

2.Download the follwing code

https://github.com/kedareswari200/fwc−module1/ blob/main/codes/src/main.cpp

3.Upload the code into the arduino board.

4.The output '1' is represented as the state:'LED ON' and '0' is represented as the state 'LED OFF'