ASSEMBLY ASSIGNMENT

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FWC22138 IITH - Future Wireless Communications
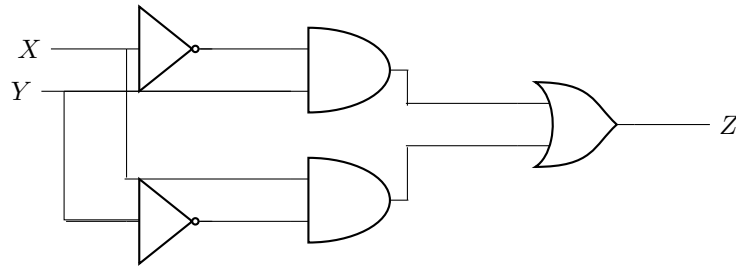
Contents

1 Problem

(GATE2019-QP-EE)

Q.36 In the circuit shown below , X and Y are digital inputs, and Z is a digital output. The equivalent circuit is a

(A) NAND gate

(B) NOR gate

(C) XOR gate

(D) XNOR gate

2 Components

Components	Value	Quantity
Arduino	Uno	1
BreadBoard		1
Jumper Wires		4

Table 1: Components

3 Implementation

3.1 Boolean Expression

By solving above expression we get :

$$z = \bar{x}.y + x.\bar{y} \tag{1}$$
$$z = \bar{x}y + x\bar{y} \tag{2}$$

3.2 Truth Table

A	B	OUT
0	0	0
0	1	1
1	0	1
1	1	0

Table 2: Truth Table

4 Hardware

1. Make the connections between the arduino and Breadboard as shown in Table3.

Arduino	5.0v	GND
Breadboard	+ve	-ve

Table 3: Connections

2. Connect one end of a jumper wire to the GND(ground) pin on the Arduino Uno board and other end to the breadboard's ground rail(-).

3. Connect one terminal of jumper wire (Input A) to the input pins on the Arduino(e.g., pin2) and other terminal to the positive rail(+) on the breadboard.

4. Connect one end of another jumper wire (Input B) to the input pin of Arduino(e.g., pin3) and other end to the positive rail(+) on the breadboard.

5. Enable the power supply to breadboard from arduino by connecting one end of jumper wire to the power pin of Arduino(5V) and other end to the positive rail(+) on the breadboard.

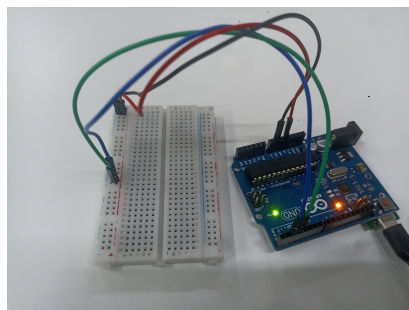6. Change the connections of input pins on the breadboard for differrent outputs.

Figure 1: Connections

5 Software

Now write the code which is available in below path and upload to the Arduino.

https://github.com/Pavan2k01/Digital-Design/blob/main/Assembly/Assembly.asm

6 Conclusion

Hence, we have implemented the XOR gate for the given circuit using the code in Assembly language with the help of Arduino.