ASSEMBLY ASSIGNMENT

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FWC22139 IITH - Future Wireless Communications

Contents

1 Problem

(GATE2022-QP-IN)
Q.21 The logic block shown has an output F given by _____

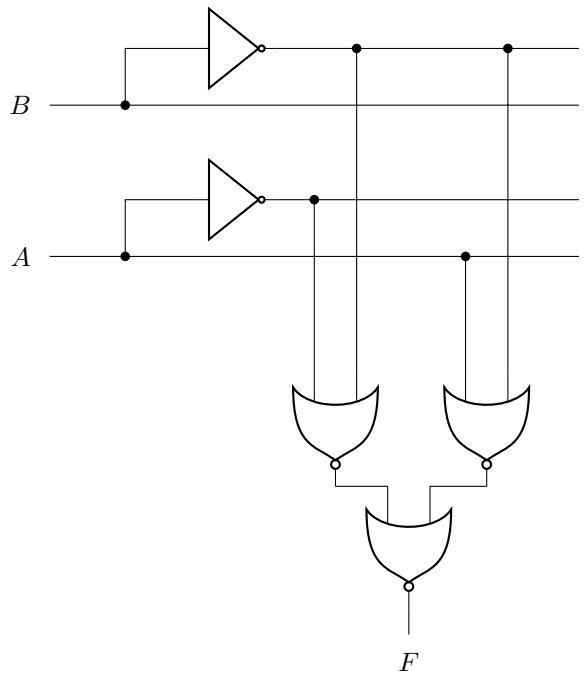

Figure 1: Circuit

(A) A + B

(B) A. $\overline{B}$

(C) A + $\overline{B}$

(D) $\overline{B}$

2 Components

Components	Value	Quantity
Breadboard	-	1
Arduino	Uno	1
Jumper Wires	-	4

Table 1: Components

2.1 Arduino

The Arduino Uno has some ground pins, analog input pins A0-A3 and digital pins D1-D13 that can be used for both input as well as output. It also has two power pins that can generate 3.3V and 5V. In this excercise we use input pins, digital pins, GND and 5V.

3 Implementation

3.1 Truth table

Input	Output
0	1
1	0

Table 2: Truth Table

3.2 Boolean Equation

By Solving the above problem we obtain as follows :

$$F = \overline{AB + \overline{A}B} \tag{1}$$

$$F = \overline{B(A + \overline{A})} \tag{2}$$

$$F = \overline{B} \tag{3}$$

4 Hardware

1. connect one end of a jumper wire to the GND(ground) pin on the Arduino Uno board and other end to the bread's ground rail(-).
2. connect input to Vcc for logic 1, ground for logic 0.
3. now execute the circuit using below code.

5 Software

Now write the code which is available in below path and upload to the Arduino.
https://github.com/SrinathReddyMarri/FWC/blob/master/assembly/asb.asm

6 Conclusion

Hence we have implemented the NOR gate for the given circuit using the code above with the help of Arduino.