ASM ASSIGNMENT

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CONTENTS

I. QUESTION

Devolop a Nand gate ($\overline{A.B}$) or ($\overline{A}+\overline{B}$) using 2x1 MUX , verify its output using an LED.

II. COMPONENTS

Component	Values	Quantity
Arduino	UNO	1
JumperWires	M-M	2
Breadboard		1
LED		1
Resistor	220ohms	1

Table.COMPONENTS

III. CIRCUIT DIAGRAM

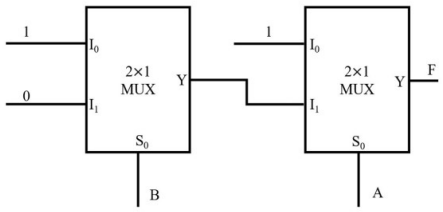

Fig. 1. NAND GATE USING 2X1 MUX

IV. PROCEDURE

1) Connect the anode (longer leg) of the LED to digital pin 13 (PB5) on the Arduino Uno.
2) Connect the cathode (shorter leg) of the LED to a current-limiting resistor (e.g., 220 ohms).
3) Connect the other end of the current-limiting resistor to the GND (ground) pin on the Arduino Uno.

V. TRUTH TABLE

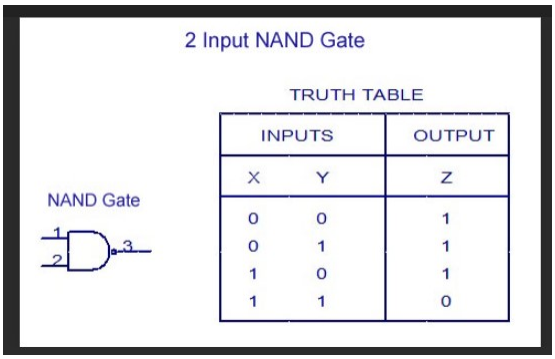

Fig. 2. NAND GATE TRUTH TABLE

A. LOGIC

From the Circuit diagram we get

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

Using Redundancy law

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

which can also be written as

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

Which is the logic of a NAND gate

VI. LED OUTPUT

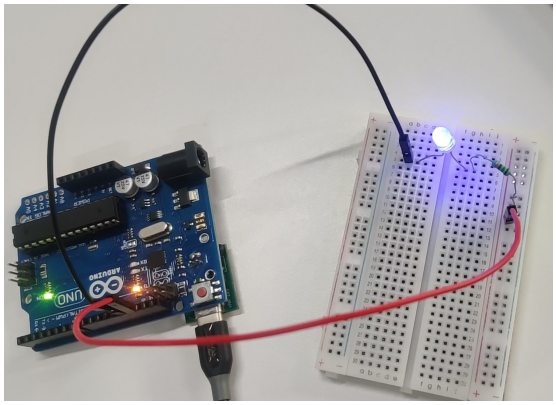

Fig. 3. LED OUTPUT

VII. OSCILLOSCOPE VISUALIZATION

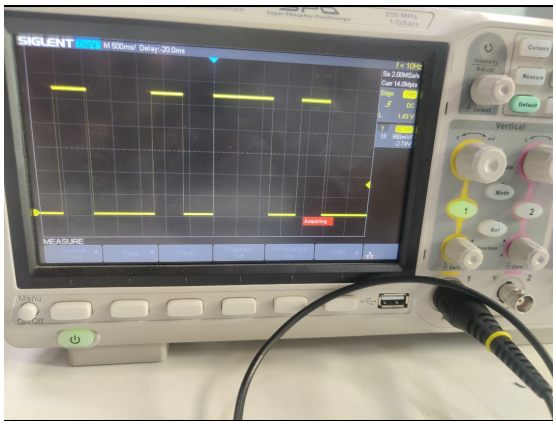

Fig. 4. OSCILLOSCOPE VISUALIZATION

VIII. CONCLUSION

Hence we have implemented the NAND gate using 2X1 MUX digital circuit.Execute the circuit using below code.

https://github.com/Vamsichowdary04/CBSE_vector_12_and_prob_12/blob/main/asm/mux.asm