



Platformio Assignment

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I. ABSTRACT

The objective is to implement and verify a Boolean function simplification using an Arduino circuit. The given Boolean function, $F(P, Q, R, S) = \overline{P}\overline{Q} + \overline{P}QS + P\overline{Q}RS + P\overline{Q}RS$ is simplified to $\overline{P}\overline{Q} + \overline{Q}S$ implementation uses an Arduino to demonstrate the function's behavior through hardware configuration and code.

II. COMPONENTS

The required components list is given in Table: I.

Components	Value	Quantity
LEDs		1
Arduino	UNO	1
Jumper Wires		10
Breadboard		1

TABLE I

III. PROCEDURE

To set up the circuit, power off the Arduino and connect the necessary components: set pin 2 as output (LED connected) and pins 3, 4, and 5 as inputs for D3, D2, and D1 respectively. Connect D3, D4, and D5 to VCC or GND according to the truth table that matches the simplified function. Once everything is set up, power on the Arduino and observe the output based on the truth table.

IV. RESULTS

Download the code given in the link below and execute them to see the output as shown in Fig.1 and Fig.2 When the circuit is set up and the Arduino is powered on, the LED (connected to pin 2) blinks according to the simplified Boolean function's logic. Adjusting the inputs (D3, D2, and D1) as per the truth table causes the LED to turn on or off accordingly, validating the implementation of the simplified function. <https://github.com/Pranaykuma/FWC-1/blob/main/Platformio/main.cpp>

P	Q	R	S	$\overline{p}q$	$\overline{q}s$	F (P,Q,R,S)
0	0	0	0	1	1	1
0	0	0	1	1	0	1
0	0	1	0	1	1	1
0	0	1	1	1	0	1
0	1	0	0	0	1	1
0	1	0	1	0	0	0
0	1	1	0	0	1	1
0	1	1	1	0	0	0
1	0	0	0	0	1	1
1	0	0	1	0	0	0
1	0	1	0	0	1	1
1	0	1	0	0	1	1

TABLE II

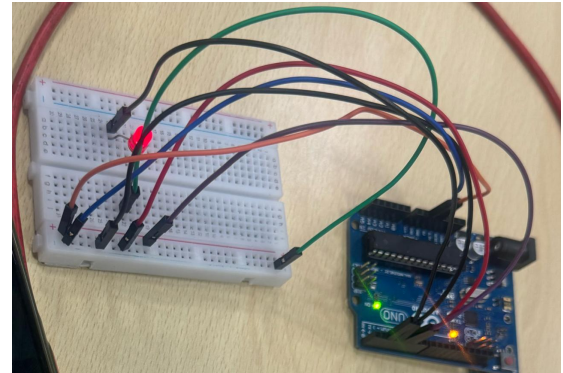


Fig. 1.

V. CONCLUSION

The experiment demonstrates the successful implementation of the simplified Boolean function using an Arduino. The LED's behavior confirms the accuracy of the function's simplification, as it responds according to the specified truth table when the inputs are adjusted, verifying the logical operation and its hardware execution.

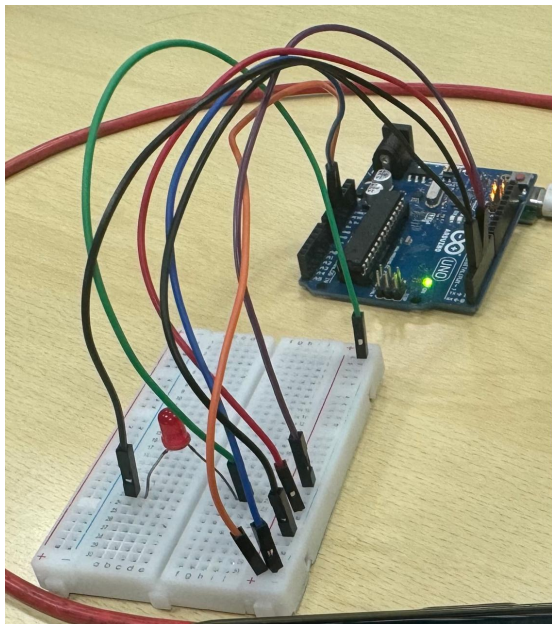


Fig. 2.