भारतीय प्रौद्योगिकी संस्थान हैदराबाद
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Platformio Assignment

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I. ABSTRACT

This paper presents the design and realizatio n of a four-variable Boolean function using two cascaded 4×1 multiplexers. The multiplexers take inputs U, V, W, X and output the minimized Boolean function $F(U, V, W, X)$. The system uses standard logic principles to reduce complexity and efficiently compute the Boolean expression. This implementation is aimed at providing a compact, reliable solution for logic circuit design, suitable for educational and industrial applications where Boolean minimization and multiplexer-based designs are needed.

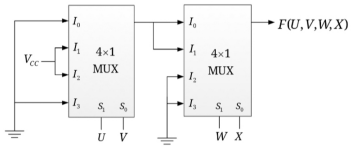

Fig. 1.

A. *Truth Table for* 4×1 *mux*

U	V	W	X	F_0	F_1
0	0	0	0	0	0
0	0	0	1	0	0
0	0	1	0	0	0
0	0	1	1	0	0
0	1	0	0	1	1
0	1	0	1	1	1
0	1	1	0	1	0
0	1	1	1	1	0
1	0	0	0	1	1
1	0	0	1	1	1
1	0	1	0	1	0
1	0	1	1	1	0
1	1	0	0	0	0
1	1	0	1	0	0
1	1	1	0	0	0
1	1	1	1	0	0

TABLE I

This truth table shows all input combinationsfor a 4×1 multiplexer. It lists corresponding outputs based on input conditions.

II. COMPONENTS

Components	Value	Quantity
LEDs		1
Arduino	UNO	1
Jumper Wires		20
Breadboard		1

TABLE II

III. PROCEDURE

1) Connect the led to the arduino uno.
2) Give the inputs manually using jumper wires.
3) Check the outputs by chaning inputs as per truth table of the 4×1 mux.
4) Execute the arduino code using the pio run command in nvim editor.
5) After upload the code into hardware setup using arduino IDE platform.

IV. RESULTS

1) Download the codes given in the link below and execute them to see the output as shown in figure 2.
2) https://github.com/BynaboyinaAiswarya/Fwc-/blob/main/Platformio/main.cpp

V. CONCLUSION

In the below figure we can see the hardware connection between arduino uno and led using jumper wires in bread board and by giving manual inputs in bread board we can observe the outputs of truth tables in terms of led. Hence implementation of 4×1 mux using led is done and verified through truth table of 4×1.

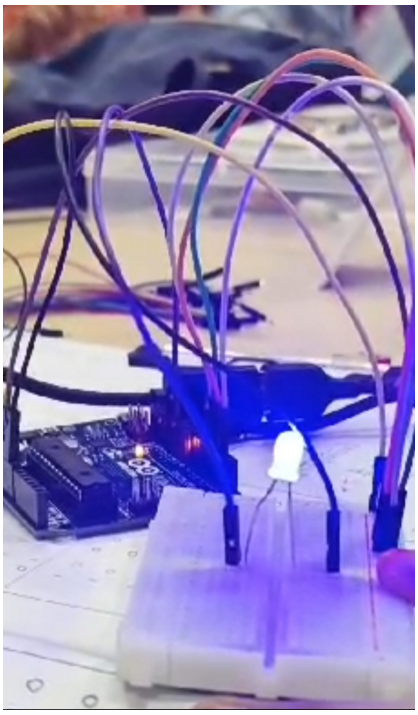

Fig. 2.