

IDE ASSIGNMENT 1

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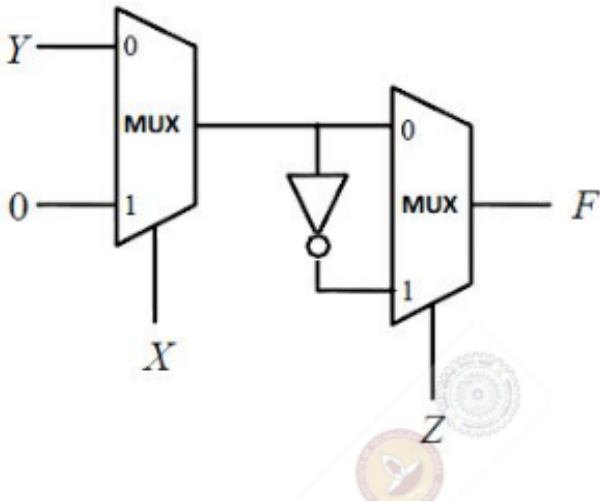


Figure 1: The logic realised by the circuit shown in figure is

Contents

1	Introduction	1
2	Components	1
2.1	Arduino	1
3	Truth Table of 2x1 Multiplexer	1
4	Boolean Equation	2
5	Truth table of given multiplexer circuit	2
6	Hardware	2

1 Introduction

Multiplexer is a combinational logic circuit designed to switch one of the several inputs lines through a single common output line by the application of a control signal. The implementation of multiplexer takes three steps

- 1.To get the truth table of multiplexer
- 2.To get the Boolean equation using the truth table by using k map.

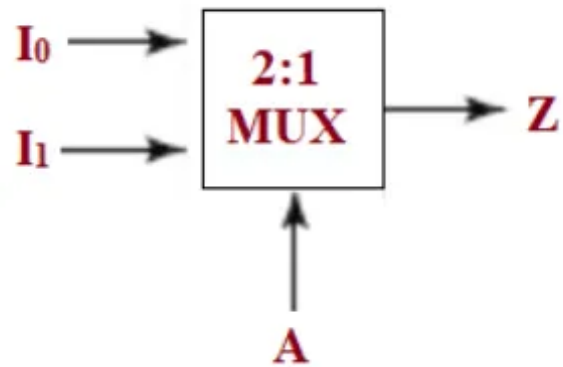


Figure 2: 2x1 Multiplexer

2 Components

Component	Value	Quantity
Arduino UNO		1
Bread board	-	1
Jumper wires	M-M	7
Resistor	150 ohm	1
Led	-	1

Figure-2 Components

2.1 Arduino

The Arduino uno has some ground pins, analog input pins A0-A5 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 the following exercises, only the ground, 5V and digital pins will be used.

3 Truth Table of 2x1 Multiplexer

The truth table for 2x1 Multiplexer as follows:
Selection line=A and output is Z

A	Z
0	I0
1	I1

By using the above truth table and from figure 2. we get the boolean equation as:
 $F = A'I_0 + AI_1$.

4 Boolean Equation

By solving the given multiplexer circuit diagram we get the boolean equation as follows:

$$F = X'YZ' + XY + Y'Z$$

5 Truth table of given multiplexer circuit

The truth table of given multiplexer circuit diagram is as:

X	Y	Z	F
0	0	0	0
0	0	1	1
0	1	0	1
0	1	1	0
1	0	0	0
1	0	1	1
1	1	0	1
1	1	1	1

6 Hardware

1. Connect Arduino to the computer and upload the code in to the arduino. Make 2,3,4 pins as input pins and 13 pin as output pin. Corresponds to the given inputs for the selection lines of multiplexer the outputs will be obtained at 13 pin. The led will glow when the output of the given boolean function is high.

vspace10mm

7 Software

Download the following code

https://github.com/PanjugalaShashikala/FWC_2022097/blob/main/ide/main.cpp