

IDE Assignment

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Abstract—This document shows how to find the boolean function of the output for the logic which is in given truth table by using KMap.

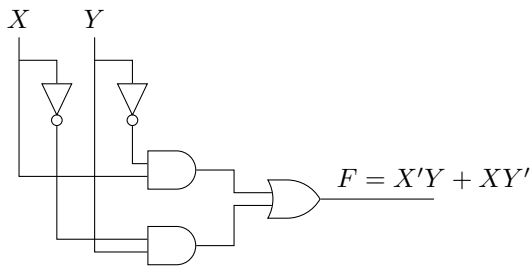


Figure 1

I. COMPONENTS

Component	Value	Quantity
Arduino	UNO	1
Resistor	220ohm	1
Bread board	-	1
Jumper wires	M-M	20
LED	-	1

II. LOGIC

The circuit takes 3-bit number from (0-7) as input X,Y,Z and produces the F as output according to the logic given in table 1.

X	Y	Z	F=X'Y+XY'
0	0	0	0
0	0	1	0
0	1	0	1
0	1	1	1
1	0	0	1
1	0	1	1
1	1	0	0
1	1	1	0

TABLE I

III. K-MAP

Using the boolean logic output F can be expressed in terms of the inputs X,Y,Z with the help of the following Kmap.

		YZ			
		00	01	11	10
X	0	0	0	1	1
	1	1	1	0	0

The boolean expression for the output F is obtained in the form of SOP after minimizing the Kmap mixterm implicants.

$$F(X,Y,Z) = \sum(2, 3, 4, 5)$$

$$F(X,Y,Z) = X'Y + XY'$$

IV. HARDWARE CONNECTION

Arduino	2	3	4	5
Inputs	Z	Y	X	F

TABLE II

1. Give the connections as per Table 2. For taking the inputs connect 5V of arduino to +ve line of bread board to consider it as logic 'HIGH'.connect GND pin of arduino to -ve line of bread board to consider it as logic 'LOW'.

For example if the inputs X,Y,Z are connected 0,1,0 respectively the output should be 1 i.e., the LED connected to the 5th pin should glow.

2. In the another case if we connect the inputs X,Y,Z to 1,1,0 respectively the output should be 0 i.e., the LED connected to 5th pin should turn off

The circuit implementation of the above function is given in figure 1.

V. PROCEDURE

- 1.Connect the arduino to the USB port of computer
- 2.Download the follwing code

<https://github.com/Riyaziith>

- 3.Upload the code into the arduino board.

4.The output '1' is represented as the state:'LED ON' and '0' is represented as the state 'LED OFF'