IDE Assignment

Mohammed Riyazuddin
FWC220110

***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.**

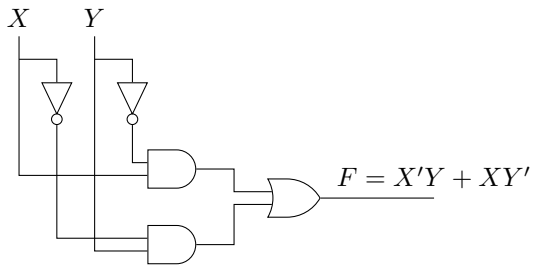


Figure 1

I. Components

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

II. Logic

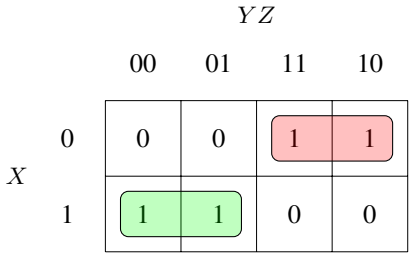
The circuit takes 3-bit number from (0-7) as input X,Y,Z and produces the F as output according to the logic given in table 1.

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.



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/FWC

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'