IMPLEMENTATION OF BOOLEAN LOGIC IN IDE

V.GOKULKUMAR
velicharlagokulkumar@gmail.com

FWC22034 IITH Future Wireless Communication (FWC) ASSIGN-1

Contents

Abstract

To Obtain the Boolean Expression for the Logic circuit shown below

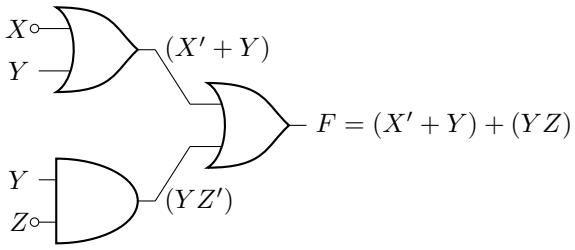

Fig. 1

1 Components

Components	Values	Quantity
Arduino	UNO	1
JumperWires	M-M	5
Breadboard		1

2 Implementation

2.1 METHOD-1

The truth table for Fig. 1 is available in Table-1 Using Boolean logic, output F in Table 1 can be expressed in terms of the inputs X, Y, Z as F=(X'+Y)+(Y.Z').....(2.1) Built in led at 13th pin of Arduino will glow for the logic '1' of F based on the initialization of X,Y,Z. The code below realizes the Boolean logic for F in Table-1

https://github.com/velicharlagokulkumar/FWC_module1/blob/main/IDE/codes/method_1/src/method_1.cpp

ubuntu command line commands

pio run.....for running
pio run −t nobuild −t upload.....for flashing

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

Table-1

2.2 METHOD-2

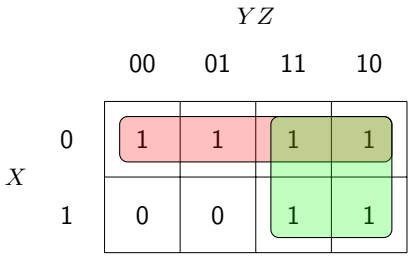

Fig. 2

Karnugh Map : The expression in (2.1) can be minimized using the K-map in Fig 2. In Fig.2 ,the implicants in boxes 0,1,2,3 result in X' The implicants in boxes 2,3,6,7 result in Y Thus, after minimization using Fig. 2, (2.1) can be expressed as F=X'+ Y.....(2.2). Verify the truth table for F in TABLE 1. The code below realizes the Boolean logic for F in 2.2

https://github.com/velicharlagokulkumar/FWC_module1/blob/main/IDE/codes/method_2/src/method_2.cpp

2.3 METHOD-3

The code below realizes the Boolean logic for F in (2.2) using 5V,GND of Arduino
D3,D4,D5 Pins of Arduino are configured as input pins instead of initializing X,Y,Z inside software,inputs are given manually as X,Y,Z.Built in led will glow based on F satisfying the Table-1

https://github.com/velicharlagokulkumar/FWC_module1/blob/main/IDE/codes/method_3/src/method_3.cpp