



BOOLEAN LOGIC IMPLEMENTATION BY USING DFLIPFLOPS WITH ARDUINO AVR GCC

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1	3	Way of using arduino
1	1	1.in arduino we are having ports B,D,C.here we are using port D pin 2,3,4 is taken as output pin.port B pins 10, 11, 12 pins are taken as a inputs. portB pins 10,11,12 pins are connected vcc or gnd in breadboard.
1	4	Truth table for given K-map

1 Abstract

This shows counter constructed with 3 DFLIPFLOPS getting boolean expressions using arduino with AVR GCC display it on sevensegment

2 Components

Component	Value	Quantity
Arduino	UNO	1
Bread board	-	1
Jumper wires	M-M	28
sevensegment	-	1
7447	IC	1
7474	IC	2

X	Y	Z	X+	Y+	Z+	D2	D1	D0
0	0	0	0	0	1	0	0	1
0	0	1	0	1	1	0	1	1
0	1	1	0	1	0	0	1	0
0	1	0	1	1	0	1	1	0
1	1	0	1	1	1	1	1	1
1	1	1	1	0	1	1	0	1
1	0	1	1	0	0	1	0	0
1	0	0	0	0	0	0	0	0

TABLE 1

5 procedure

Step 1: connect 5v of the Arduino to the top red of the bread board and GND to the bottom green

Step 2: connect 2 7474 ics in the bread board for further connections.1 st flipflop act as 2 flipflops

Step 3: connect d13 pin in the arduino to

connect breabboard the to connect the as clk to the flipflop. d13 pin connect to the pin3 and pin 11 of 1st flipflop and pin3 of 2nd flipflop

Step 4: connect 5v to the pin 14 and pin 1 and pin4 and pin10 and pin 13 of the 1st flipflop and pin1 and pin 14 and pin4 of 2nd flipflop

Step 5: connect 7447 decoder pins 13 to 9 to the sevensegment given a,b,c,d,e respectively and pin f to the 15 pin of sevensegment.com of the seven segment connect to vcc by using through resisitor

Step 6: now pins 8,9,10 and 2,3,4 pins in ardino connect them in breadboard in parallel way

Step 7: take 3 new cables connect their one end in the end of the 3 parallel connected cables.other end of the cables connect to the 7,1,2 pins in the decoder serially and pin6 to the gnd

Step 8:finally run code in the arduino and check results of newmerical values shown sevenseg-ment like 0,1,3,2,6,7,5,4 as per truthtable

6 circuit connections

Arduino	2,4	3	8,10	9	13	5V	GND
7474	2	12	5	9	3, 11	1, 4, 10, 13, 14	7
7447	7	1				16	2, 6, 8

7 BooleanEquation

By solving the given K-map diagram we get the boolean equation as follows

$$D2 = AC + BC'$$

$$D1 = A'C + BC'$$

$$D0 = A'B' + AB$$

8 Software

Execute the following code using the below provided link.

<https://github.com/satthish-devaragatla>