Assignment No.1

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Download IDE code from

https://github.com/dukkipativijay/Fwciith2022/blob/main/Assignment1.cpp

Download Assembly code from

https://github.com/dukkipativijay/Fwciith2022/tree/main/Assignment%201/Codes/asm

Download GCC code from

https://github.com/dukkipativijay/Fwciith2022/blob/main/Assignment%201%20-%20GCC/main.c

and latex-tikz codes from

https://github.com/dukkipativijay/Fwciith2022/blob/main/Assignment%201/Latex%20File.tex

1 Question-2016 Section C Q6(d)

Reduce the following Boolean Expression to its simplest form using k-map $F = (X, Y, Z, W) = \sum(2, 6, 7, 8, 9, 10, 11, 13, 14, 15)$

2 Contents

Abstract- **This manual shows how to use 7447 BCD-seven segment display encoder to display Boolean Logic**

3 Components

Component	Value	Quantity
Resistor	220 Ohm	1
Arduino	UNO	1
Seven Segment Display		1
Decoder	7447	1
Jumper Wires	M-M	20
Breadboard		1

Table 3.0

4 Hardware

Make connections between seven segment display and the 7447 ic as per the given table

7447	a'	b'	c'	d'	e'	f'	g'
Display	a	b	c	d	e	f	g

Table 4.0

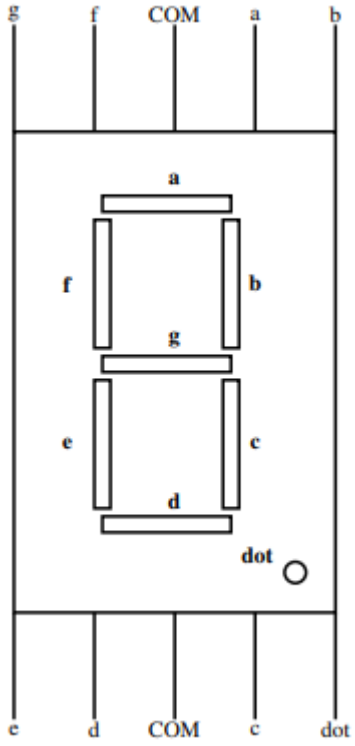

Figure 1

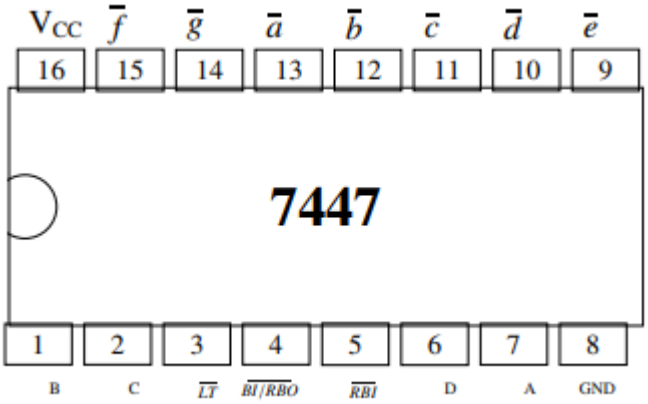

Figure 2

7447	D	C	B	A
Arduino	5	4	3	2

Table 4.1

	X	Y	Z	W
Input	0	1	1	0
Arduino	6	7	8	9

Table 4.2

In the above example we are taking number 6 as input to the arduino and displaying 1 on the seven segment display.

5 Solution

Truth Table

X	**Y**	**Z**	**W**	**F**
0	0	0	0	0
0	0	0	1	0
0	0	1	0	1
0	0	1	1	0
0	1	0	0	0
0	1	0	1	0
0	1	1	0	1
0	1	1	1	1
1	0	0	0	1
1	0	0	1	1
1	0	1	0	1
1	0	1	1	1
1	1	0	0	0
1	1	0	1	1
1	1	1	0	1
1	1	1	1	1

Table 5.0

XY \ *ZW*	00	01	11	10
00	0	0	0	1
01	0	0	1	1
11	0	1	1	1
10	1	1	1	1

Table 5.1

The expression in the above k-map results in XY'

XY \ *ZW*	00	01	11	10
00	0	0	0	1
01	0	0	1	1
11	0	1	1	1
10	1	1	1	1

Table 5.2

The expression in the above map k-map results in XW

XY \ *ZW*	00	01	11	10
00	0	0	0	1
01	0	0	1	1
11	0	1	1	1
10	1	1	1	1

Table 5.3

The expression in the above map k-map results in XZ

XY \ *ZW*	00	01	11	10
00	0	0	0	1
01	0	0	1	1
11	0	1	1	1
10	1	1	1	1

Table 5.4

The expression in the above k-map results in YZ

XY \ *ZW*	00	01	11	10
00	0	0	0	1
01	0	0	1	1
11	0	1	1	1
10	1	1	1	1

Table 5.5

The expression in the above k-map results in ZW’

By solving the above Karnaugh Map, we get the simplified boolean expression given below

$$F = XY' + XW + XZ + YZ + ZW'$$