Assignment No.1

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Get CPP code from

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

Get Assembly code from

https://github.com/dukkipativijay/Fwciith2022/tree/main/Assignment%201%20-%20Assembly/Codes

Get GCC code from

https://github.com/dukkipativijay/Fwciith2022/tree/main/Assignment%201%20-%20GCC/codes

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 $F(X,Y,Z,W) = \sum(2,6,7,8,9,10,11,13,14,15)$

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

2 Contents

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	13	12	11	10	9	15	14
Display	a	b	c	d	e	f	g

Table 4.0

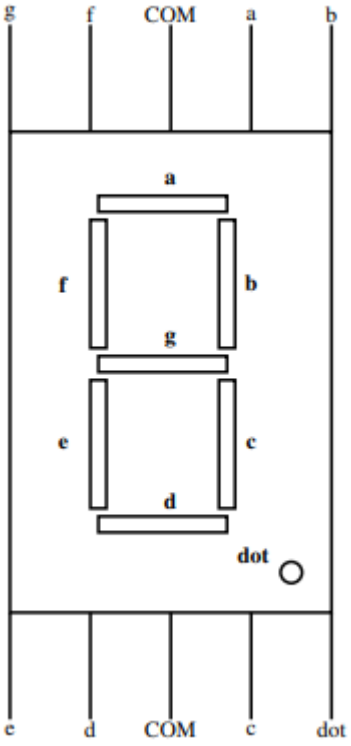

Figure 1

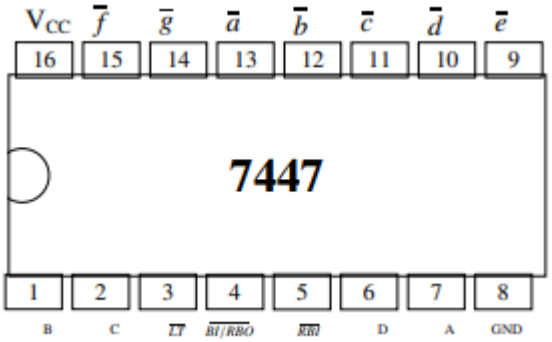

Figure 2

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 in binary format by taking 0,1,1,0 as input to the Arduino digital pins 6,7,8,9 respectively.

5 Solution

Truth Table

X	**Y**	**Z**	**W**	**F(X,Y,Z,W)**
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 from the above k-map is 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 from the above k-map is 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 from the above k-map is 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 from the above k-map is 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 from the above k-map is ZW'

1. From Table 5.1, we get our first term as XY'
2. By solving Table 5.2 we get the second term as XW
3. By solving the k-map in Table 5.3, we get the third term as XZ
4. By Solving Table 5.3 we get the fourth term as YZ
5. From the Table 5.5 we get the last term as ZW'

Finally we get the simplified boolean expression below

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