Assignment No.1

Surabhi Seetha

You can get all assembly codes here

https://github.com/SurabhiSeetha/Fwciith2022/tree/main/Assignment%201/codes/asm

You can get all python codes here

https://github.com/SurabhiSeetha/Fwciith2022/tree/main/Assignment%201/codes/src

You can get all avr gcc codes here

https://github.com/SurabhiSeetha/Fwciith2022/tree/main/avr%20gcc

and latex-tikz codes from

https://github.com/SurabhiSeetha/Fwciith2022/blob/main/Assignment%201/(Latex).tex

1 Question-2015 Section C Q6(d)

Reduce the following Boolean Expression to its simplest form using k-map $F(X,Y,Z,W) = \sum(0,1,6,8,9,10,11,12,15)$

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

2 Contents

Components 3
Hardware 4
Solution 5

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

Table 4.0

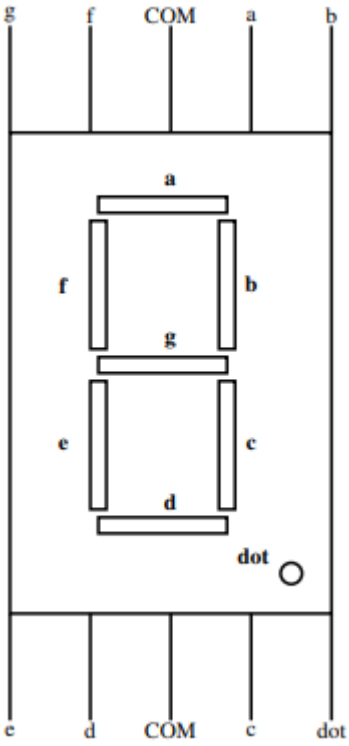

Figure 1

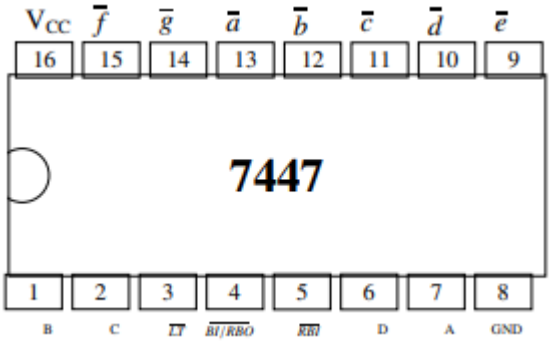

Figure 2

Make the connections from 7447 ic pins A,B,C,D onto the arduino board pins

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 arduino,so the connections are made accordingly by giving it to 0 which is ground and 1 to the input.

5 Solution

Truth Table

X	**Y**	**Z**	**W**	**F(X,Y,Z,W)**
0	0	0	0	1
0	0	0	1	1
0	0	1	0	0
0	0	1	1	0
0	1	0	0	0
0	1	0	1	0
0	1	1	0	1
0	1	1	1	0
1	0	0	0	1
1	0	0	1	1
1	0	1	0	1
1	0	1	1	1
1	1	0	0	1
1	1	0	1	0
1	1	1	0	0
1	1	1	1	1

Table 5.0

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

Table 5.1

The expression from above k-map is XY'

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

Table 5.2

The expression from above k-map is XZ'W'

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

Table 5.3

The expression from above k-map is XZW

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

Table 5.4

The expression from above k-map is Y'Z'

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

Table 5.5

The expression from above k-map is XYZW'

1.By solving the expression in Table 5.1, we get our first term as XY'
2.By solving Table 5.2 we get the second term as XZ'W'
3.By solving the k-map in Table 5.3, we get the third term as XZW
4.By Solving Table 5.3 we get the fourth term as Y'Z'
5.Finally for the last term, we get the term from the Table 5.5 as X'YZW'

$$F = XY' + XZ'W' + XZW + Y'Z' + X'YZW'$$