BCD to 2'S Complement

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Abstract

This objective of this document is to show Conversion between BCD to 2's Complement

1 Components

Component	Value	Quantity
Arduino	UNO	1
Resistor	220ohm	4
Bread board	-	1
Jumber wires	M-M	20
Led	-	4

2 BCD to 2's Complement

The Converter takes 4-bit boolean number as input and produces 2's complement as output.The corresponding truth tables is avaiable

Z	Y	X	W	A	B	C	D
0	0	0	0	0	0	0	0
0	0	0	1	1	1	1	1
0	0	1	0	1	1	1	0
0	0	1	1	1	1	0	1
0	1	0	0	1	1	0	0
0	1	0	1	1	0	1	1
0	1	1	0	1	0	1	0
0	1	1	1	1	0	0	1
1	0	0	0	1	0	0	0
1	0	0	1	0	1	1	1

3 Boolean logic

Using Boolean logic,output A in table 0 can be expressed in terms of inputs W,X,Y,Z as

A=Z'W+Z'X+Z'YX'+ZY'X'W'

B=Z'YX'W'+Y'X'W+Z'Y'X

C=Z'X'W+Y'X'W+Z'XW'

D=Z'W+Y'X'W

4 karnaugh-map

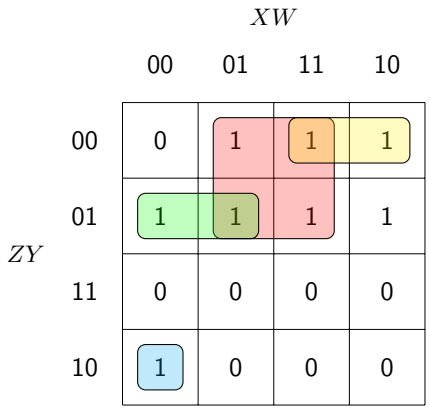

FIG 1: K-map for A

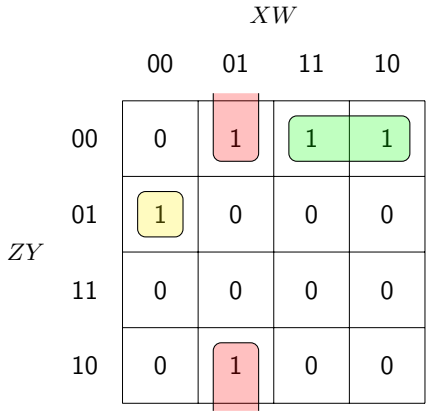

Fig 2: K-map for B

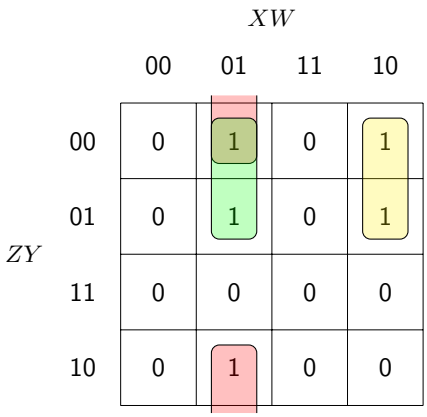

Fig 3: K-map for C

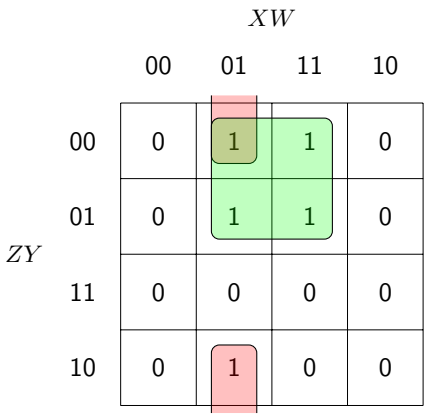

Fig 4: K-map for D

5 Hardware Connection

Arduino	2	3	4	5
Leds	led1	led2	led3	led4

Fig :4

Give the connections as per Table 4. For taking the inputs connect 5V of arduino to +ve line of bread board to consider it as logic 'HIGH'.connect GND pin of arduino to -ve line of bread board to consider it as logic 'LOW'.

6 Software

1.Connect the arduino to the computer
2.Download the follwing code

https://github.com/Vamsi9849/iithfwc/blob/main/assignment%20codes/codes/bcd%20to%202's%20complement.txt

3.The led will ON and OFF according to the given input