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K - Map Assignment

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I. ABSTRACT

This paper explains a Karnaugh maps (K-map) by finding the logic functions for the incrementing decoder from 0 to 9 and don't care condition using arduino uno.

II. COMPONENTS

The required components list is given in Table: I., seven segment display is shown in Fig.1, and 7447 IC pin diagram is shown in Fig-2.

Components	Value	Quantity
IC	7447	1
seven segment display		1
Arduino	UNO	1
Jumper Wires		50
Breadboard		1

TABLE I

III. PROCEDURE

1) Make the connections of arduino, and 7447 ICs according to Fig-4.
2) Make the connections of seven segment display and 7447 IC as below fig-5.
3) Truth Table for k-map without don't care and incrementing from 0 to 9 :

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

TABLE II

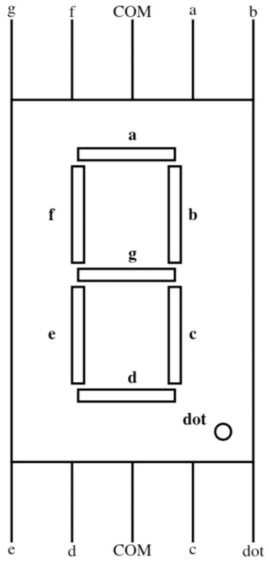

Fig. 1.

Fig. 2.

4) Truth Table for k-map with don't care condition :
5) Execute the arduino code without any errors.
6) After upload the code into hardware setup using arduino IDE platform with hex file.

7447	$\bar{a}$	$\bar{b}$	$\bar{c}$	$\bar{d}$	$\bar{e}$	$\bar{f}$	$\bar{g}$
Display	a	b	c	d	e	f	g

Fig. 3.

7447	D	C	B	A
Arduino	5	4	3	2

Fig. 4.

IV. RESULTS

1) Download the code given in the link below and execute them to see the output as shown in Fig.5.
2) https://github.com/patnamkeerthi4545/Fwc/blob/main/kmap/main.cpp

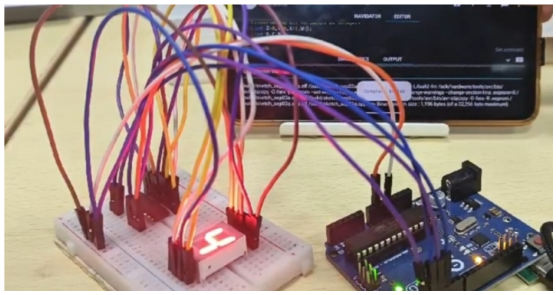

Fig. 5.

V. CONCLUSION

Hence implementation of K-Map using 7447 IC and Seven segment dispaly using arduino UNO is done.

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

TABLE III