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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

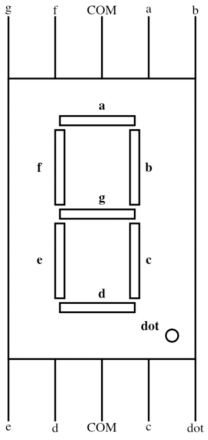

Fig. 1.

Fig. 2.

III. PROCEDURE

1) Make the connections of arduino, and 7447 ICs according to Fig-4.

7447	D	C	B	A
Arduino	5	4	3	2

Fig. 3.

2) Make the connections of seven segment display and 7447 IC as below fig-5.

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

Fig. 4.

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

4) Truth Table for k-map with don't care condition :

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

5) Execute the arduino code without any errors.
6) After upload the code into hardware setup using arduino IDE platform with hex file.

IV. RESULTS

1) Download the code given in the link below and execute them to see the output as shown in Fig.6,7.
2) Increament - https://github.com/BynaboyinaAiswarya/Fwc-/blob/main/Ide/K-Map/txtinc.cpp

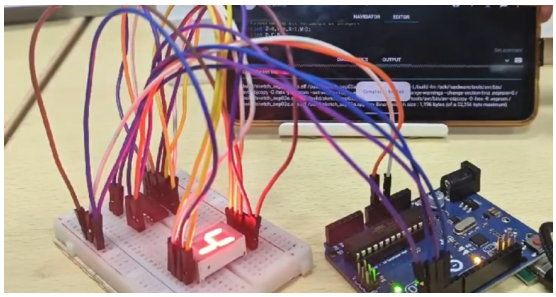

Fig. 5.

3) Decreament - https://github.com/BynaboyinaAiswarya/Fwc-/blob/main/Ide/K-Map/Txtdec.cpp

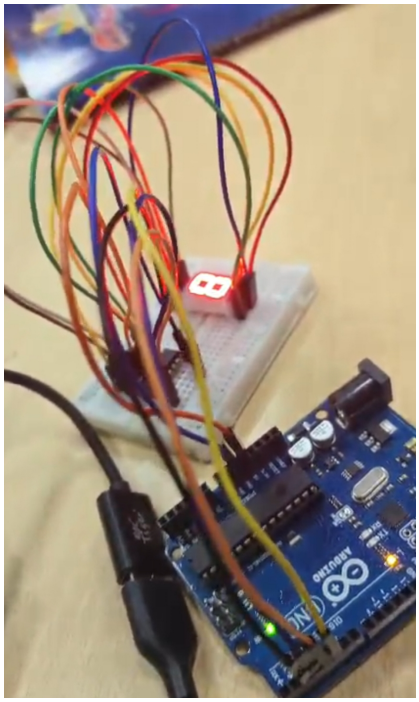

Fig. 6.

V. CONCLUSION

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