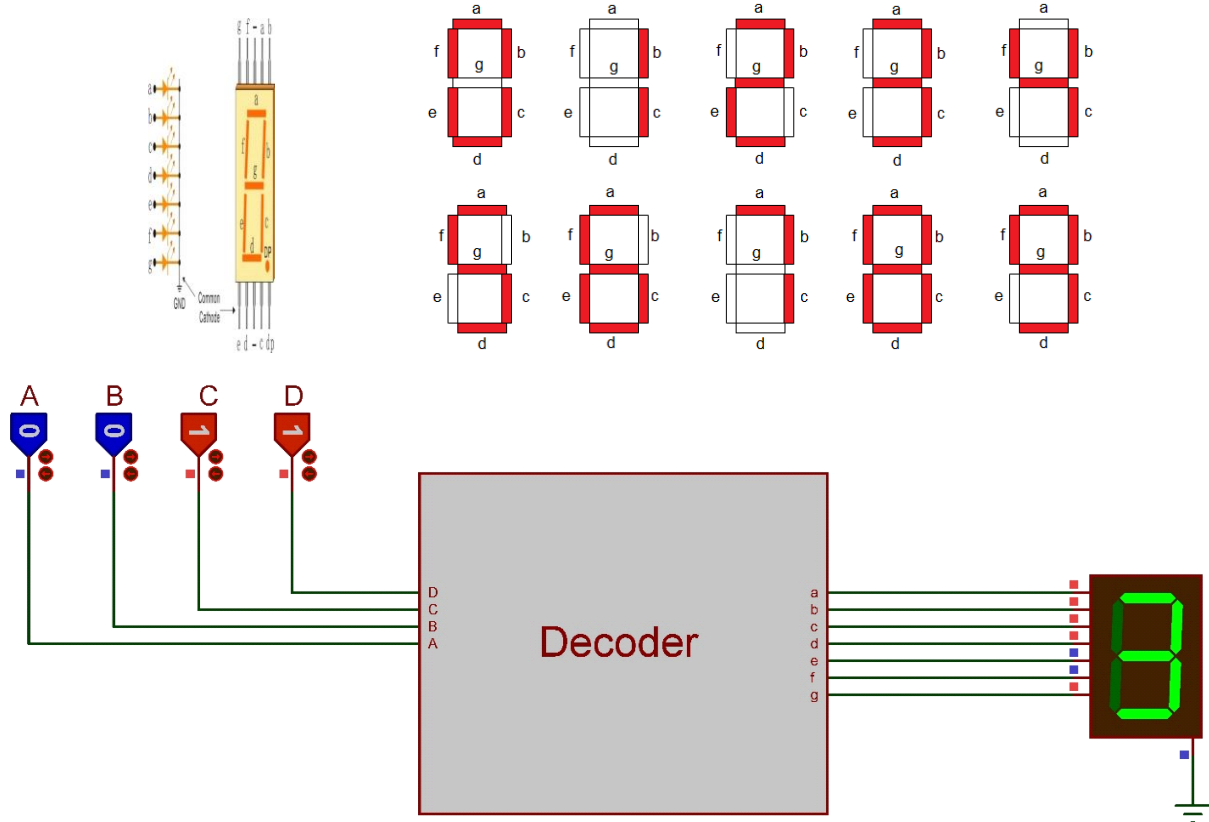


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LAB03 Assignment



Your task is to design a decoder circuit that runs a 7-segment display. The circuit must show the numbers from 0 to 9 that is controlled with 4-bit input (ABCD). The steps you should do as follows.

1. Fill the truth table in page 2.
2. **Fill the Karnaugh Maps** on the page 3 to obtain the simplest Boolean function for each LED (from **a** to **g**) of the 7-segment display. We did first 3 LED (a,b,c) in the Lab class. Fill the karnaugh maps in page 3 and write the functions you obtained to the last row of each K-Map table. For each rectangle use different colors on the rectangles to make the table easy to understand (Example tables is given in the first K-Map which is for Fa, Fb, Fc). (To add rectangle you can copy and paste existing ones)

PS: Upload first and second questions as single .pdf file.

3. Finally, design the Boolean functions on Proteus Design Suite. (Use JUMPERS as we did in the lab!). Upload the project file.

PS: Don't forget to fill your name and student number on each page.

Truth Table

Digit	Inputs				Outputs (Seven Segment Led Pins)						
	A	B	C	D	a	b	c	d	e	f	g
0	0	0	0	0	1	1	1	1	1	1	0
1	0	0	0	1	0	1	1	0	0	0	0
2	0	0	1	0	1	1	0	1	1	0	1
3	0	0	1	1	1	1	1	1	0	0	1
4	0	1	0	0	0	1	1	0	0	1	1
5	0	1	0	1	1	0	1	1	0	1	1
6	0	1	1	0	1	0	1	1	1	1	1
7	0	1	1	1	1	1	1	0	0	0	0
8	1	0	0	0	1	1	1	1	1	1	1
9	1	0	0	1	1	1	1	1	0	1	1

Emre Eldemir

CD	00	01	11	10
AB				
00	1	0	1	1
01	0	1	1	1
11	X	X	X	X
10	1	1	X	X
$B'D' + BD + C + A$				

CD	00	01	11	10
AB				
00	1	1	1	1
01	1	0	1	0
11	X	X	X	X
10	1	1	X	X
$C'D' + CD + B'$				

CD	00	01	11	10
AB				
00	1	1	1	0
01	1	1	1	1
11	X	X	X	X
10	1	1	X	X
$C' + D + B$				

CD	00	01	11	10
AB				
00	1	0	1	1
01	0	1	0	1
11	X	X	X	X
10	1	1	X	X
$B'C + CD' + BC'D + A + B'D'$				

CD	00	01	11	10
AB				
00	1	0	0	1
01	0	0	0	1
11	X	X	X	X
10	1	0	X	X
$CD' + B'D'$				

CD	00	01	11	10
AB				
00	1	0	0	0
01	1	1	0	1
11	X	X	X	X
10	1	1	X	X
$A + C'D' + BD' + BC'$				

CD	00	01	11	10
AB				
00	0	0	1	1
01	1	1	0	1
11	X	X	X	X
10	1	1	X	X
$BC' + B'C + A + CD'$				