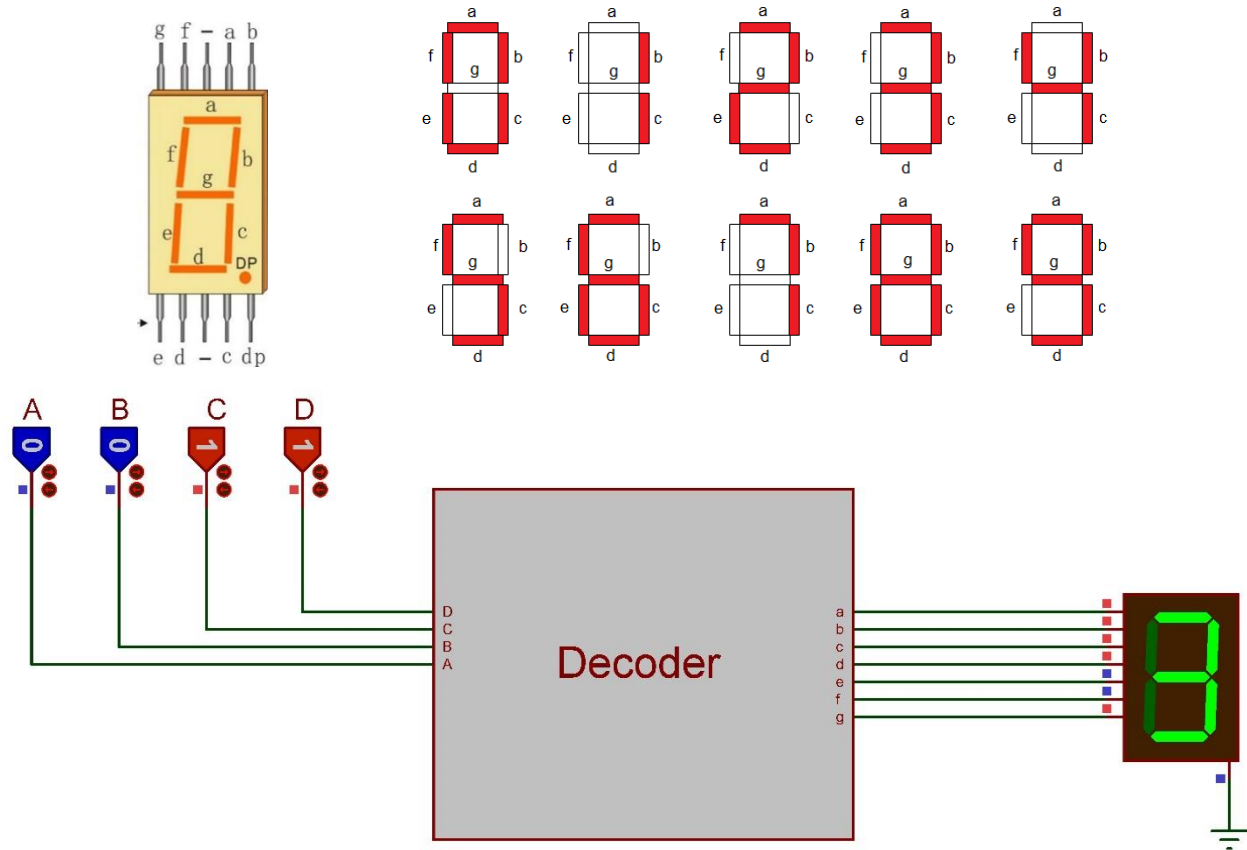


Name, Last name:
Student No:

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 based on the led statuses given in the picture above.
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 the completed version of this file as a 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. 7 Segment display must show all the digits (0-9) correctly corresponding to BCD input. A base design file is given in the assignment.

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

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	0	0	0	1	0	1	1				
2	0	0	1	0	1	1	0				
3	0	0	1	1	1	1	1				
4	0	1	0	0	0	1	1				
5	0	1	0	1	1	0	1				
6	0	1	1	0	1	0	1				
7	0	1	1	1	1	1	1				
8	1	0	0	0	1	1	1				
9	1	0	0	1	1	1	1				

AB \ CD	00	01	11	10
00	1	0	1	1
01	0	1	1	1
11	X	X	X	X
10	1	1	X	X

$$F_a = B'D' + BD + C + A$$

AB \ CD	00	01	11	10
00	1	1	1	1
01	1	0	1	0
11	X	X	X	X
10	1	1	X	X

$$F_b = C'D' + CD + B'$$

AB \ CD	00	01	11	10
00	1	1	1	0
01	1	1	1	1
11	X	X	X	X
10	1	1	X	X

$$F_c = C' + D + B$$

AB \ CD	00	01	11	10
00				
01				
11				
10				

$$F_d =$$

AB \ CD	00	01	11	10
00				
01				
11				
10				

$$F_e =$$

AB \ CD	00	01	11	10
00				
01				
11				
10				

$$F_f =$$

AB \ CD	00	01	11	10
00				
01				
11				
10				

$$F_g =$$