

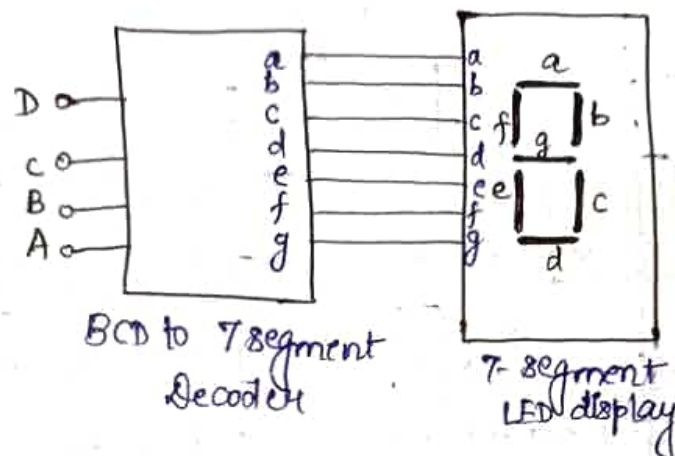
LAB 2 Pre-labwork

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AV232

BCD code (4 bit) to Seven Segment Display (8bit)

Types of seven segment display:

- ① Common Cathode: All cathodes of the 7 LEDs are connected together to the ground or $-V_{CC}$ and the anodes are supplied with HIGH signal.
- ② Common Anode: All the anodes are connected to battery or $+V_{CC}$ and individual cathodes are supplied with Low signal.



Truth Table: (For common cathode type)

	A	B	C	D	a	b	c	d	e	f	g	
0	0	0	0	0	1	1	1	1	1	1	0	0
1	0	0	0	1	0	1	1	0	0	0	0	1
2	0	0	1	0	1	1	0	1	1	0	1	2
3	0	0	1	1	1	1	1	1	0	0	1	3
4	0	1	0	0	0	1	1	0	0	1	1	4
5	0	1	0	1	1	0	1	1	0	1	1	5
6	0	1	1	0	1	0	1	1	1	1	1	6
7	0	1	1	1	1	1	1	0	0	0	0	7
8	1	0	0	0	1	1	1	1	1	1	1	8
9	1	0	0	1	1	1	1	1	0	1	1	9

K-Map Deduction

For a:

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

$$a = A + c + BD + \bar{B}\bar{D}$$

For b:

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

$$b = \bar{B} + \bar{C}\bar{D} + CD$$

For c:

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

$$c = B + \bar{C} + D$$

For d:

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

$$d = \bar{B}\bar{D} + \bar{C}\bar{D} + \bar{B}C\bar{D} + \bar{B}C + A$$

For e:

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

$$e = \bar{B}\bar{D} + \bar{C}\bar{D}$$

For f:

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

$$f = A + \bar{C}\bar{D} + \bar{B}\bar{C} + \bar{B}\bar{D}$$

For g:

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

$$g = \bar{B}C + \bar{C}\bar{D} + \bar{B}\bar{C} + A$$

Logic Circuit

