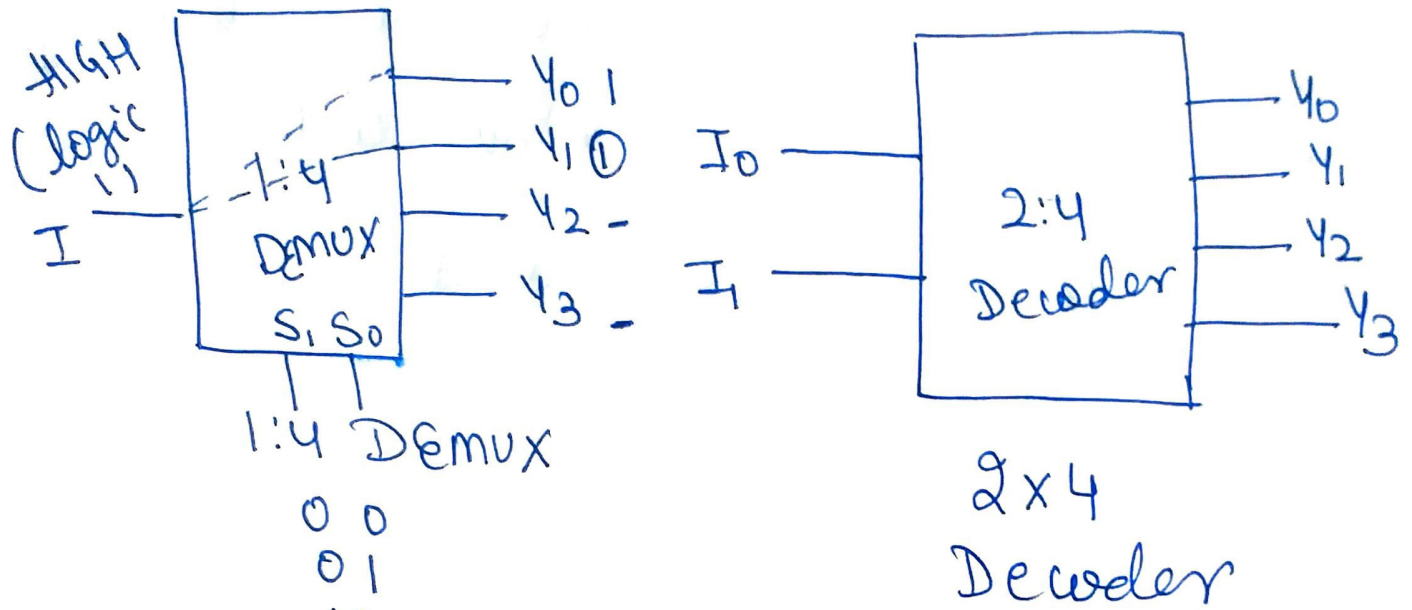


## DEMUX as decoder

→ 2:4 decoder.



1:8 DEMUX to 3:8 decoder.

- ↳ In DEMUX selection lines decide the O/P
- ↳ In Decoder  $I_0$  &  $I_1$  decide the O/Ps

$I_1, I_0$	$Y_0$	$Y_1$	$Y_2$	$Y_3$
0 0	1	0	0	0
0 1	0	1	0	0
1 0	0	0	1	0
1 1	0	0	0	1

Decoder

Make 3:8 decoder by 1:8 DEMUX

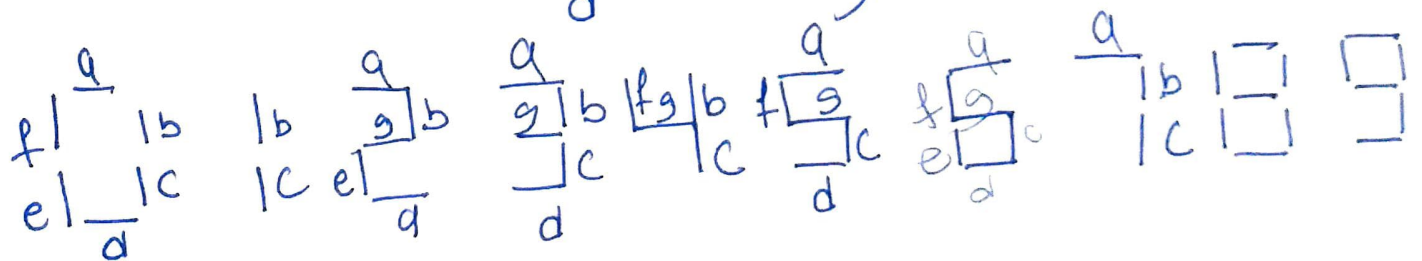
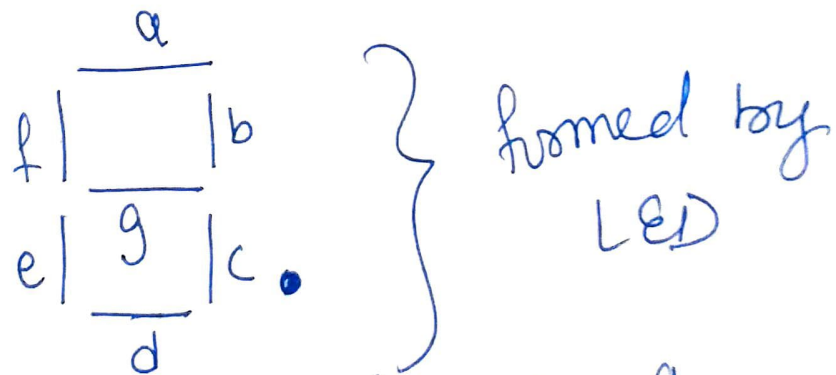
## Code Converters

↳ A Code Converter is a logic circuit that changes data present in one type of binary code to another type of binary code.

↳ Commonly used Code Converter

- 1) BCD to binary
- 2) Binary to BCD
- 3) Binary to Gray Code
- 4) Gray to Binary.

↳ Seven Segment Display Decoder



↳ According LED glows.

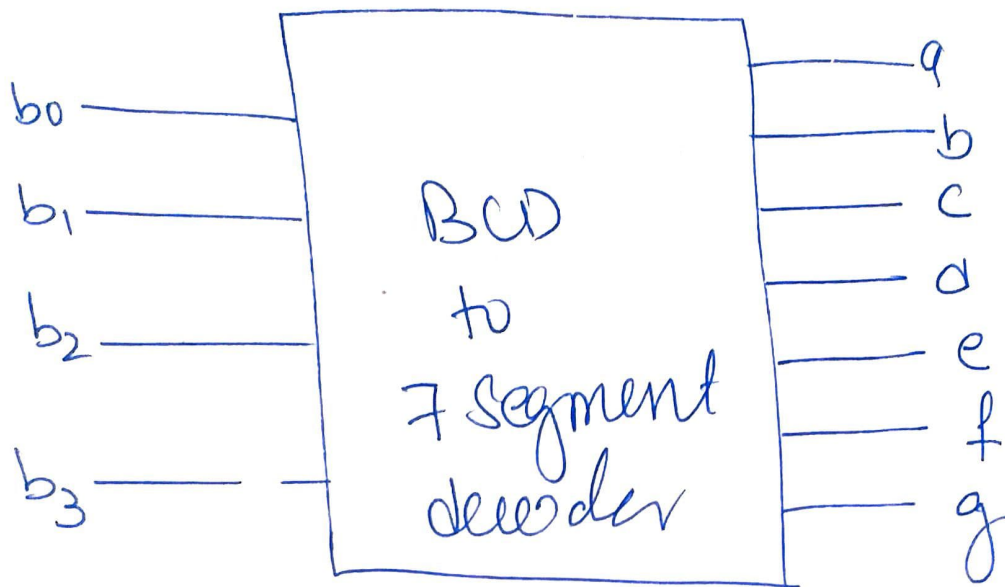
$b_3$	$b_2$	$b_1$	$b_0$	a	b	c	d	e	f	g
0	0	0	0	1	1	1	1	1	1	0
0	0	0	1	0	1	1	0	0	0	0
0	0	1	0	1	1	0	1	1	0	1
0	0	1	1	1	1	1	1	0	0	1
0	1	0	0	0	1	1	0	0	1	1
0	1	0	1	1	0	1	1	0	1	1
0	1	1	0	1	0	1	1	1	1	1
0	1	1	1	1	1	1	0	0	0	0
1	0	0	0	1	1	1	1	1	1	1
1	0	0	1	1	1	1	1	0	1	1

1 0 1 0  
 1 1 1 1

don't  
care

↓  
 we need two 7 segment display

one for 1 4  
 one for 4



a:-

$b_3b_2$	$b_1b_0$				
	00	01	11	10	
00	1	0	1	1	$\underline{111}$
01	0	1	1	1	
11	X	X	X	X	$\underline{11}$
10	1	1	X	X	$\underline{1}$

$$a = b_3 + b_1 + \bar{b}_2 \bar{b}_0 + b_2 b_0$$

$$= b_3 + b_1 + b_2 \odot b_0$$

b:-

$b_3b_2$	$b_1b_0$				
	00	01	11	10	
00	X	1	1	1	$\underline{111}$
01	1	0	1	0	
11	X	X	X	X	$\underline{11}$
10	1	1	X	X	

$$b = b_3 + b_1 b_0 + \bar{b}_3 \bar{b}_2 + \bar{b}_1 \bar{b}_0$$

$$c = b_3 + b_2 + \bar{b}_1 + b_0$$

$$d = b_3 + b_1 \bar{b}_0 + \bar{b}_2 \bar{b}_0 + \bar{b}_2 b_1 + b_2 \bar{b}_1 b_0$$

$$e = b_1 \bar{b}_0 + \bar{b}_2 \bar{b}_0$$

$$f = b_3 + b_2 \bar{b}_1 + b_2 \bar{b}_0 + \bar{b}_1 \bar{b}_0$$

$$g = b_3 + b_1 \bar{b}_0 + b_2 \bar{b}_1 + \bar{b}_2 \bar{b}_1$$