Cse260

Lab Assignment - 7

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Ans:

(1) Name of the Experiment:

Designing a circuit that outputs 2's complement of a 3 bit number using encoder & decoder.

(2) Objective:

i) To understand the hardware system to Calculate 2's ~~complet~~ complement of a 3-bit number. (using encoder and decoder).

ii) To have ideas regarding encoder and decoder

iii) To implement ~~ent~~ encoder and decoder in practical circuits.

(3) Required Components and Equipments:

↳ IC: 74ls138 [decoder]

↳ IC: 74ls148 [encoder].

↳ Inputs (using logicstate)

↳ LEDs (Blue or any other color)

↳ Power Source / Ground

↳ NOT Logic Grate

(4) Experimental Setup (i.e., diagram of the circuit):

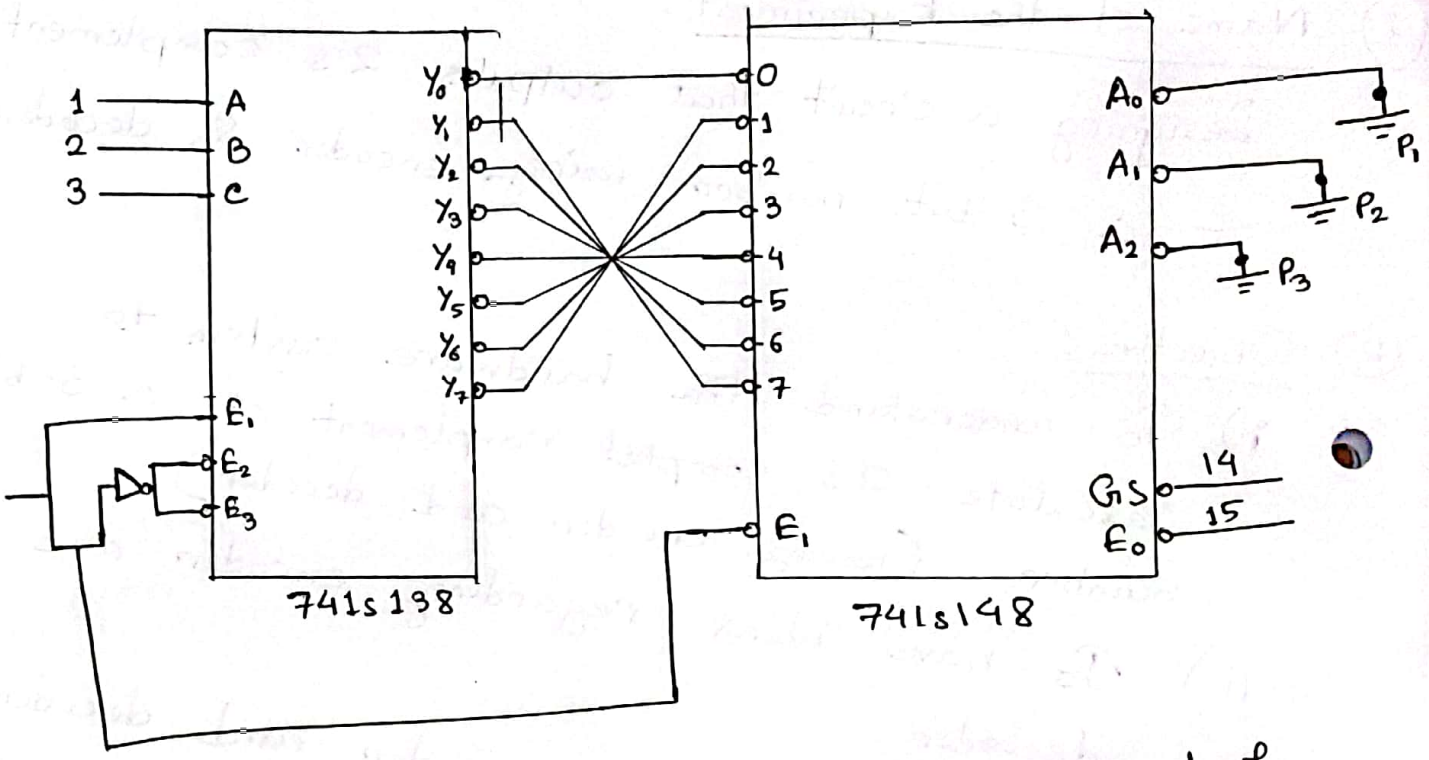

Figure no: Circuit giving output of 2's Complement.

(5) Results and Discussions

(a) To draw 1's complement, we will add Not gates ~~in between~~. at the end.

Circuit diagram with encoder and decoder that will output the 1's complement of 3 bit number is %

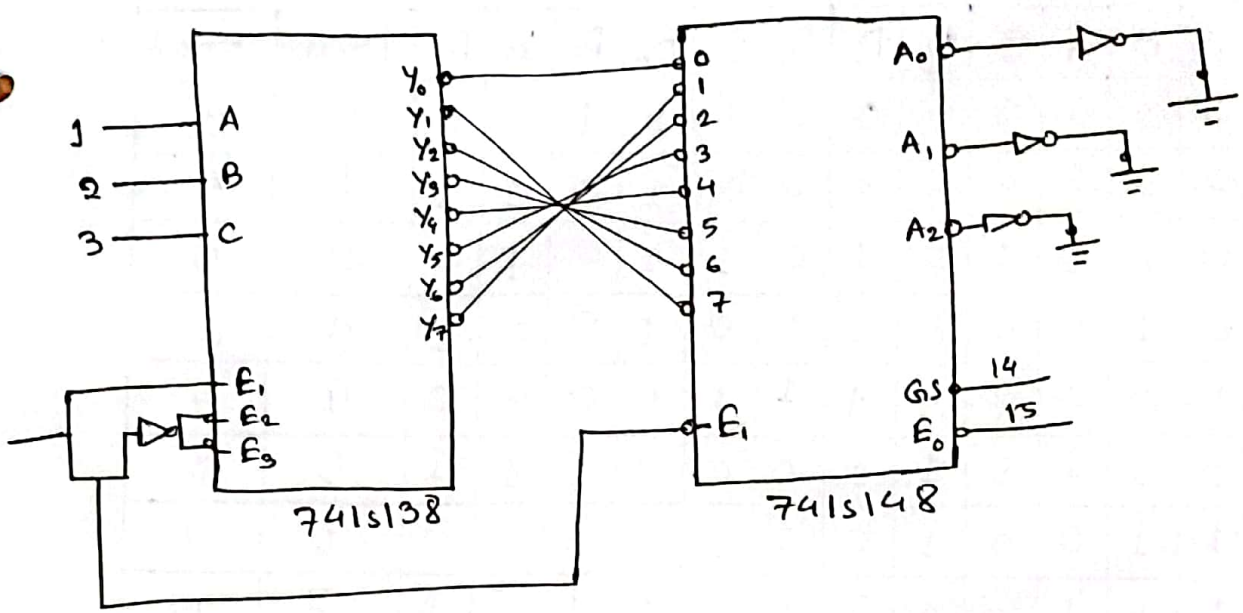

Figure no: Circuit giving output of 1's complement.

(5) (b) Yes, I can implement a code converter with encoder and decoder by designing BCD to Excess -3 code converter with the use of 4x16 decoder and 16x4 encoder.

Truth Table:

Inputs.					Outputs					Active Low Output				Output line Connection	
Min Term	D	C	B	A	Min Term	D_3	D_2	D_1	D_0	D_3	D_2	D_1	D_0	Decoder	Encoder
0	0	0	0	0	3	0	0	1	1	1	1	0	0	0	3
1	0	0	0	1	4	0	1	0	0	1	0	1	1	1	4
2	0	0	1	0	5	0	1	0	1	1	0	1	0	2	5
3	0	0	1	1	6	0	1	1	0	1	0	0	1	3	6
4	0	1	0	0	7	0	1	1	1	1	0	0	0	4	7
5	0	1	0	1	8	1	0	0	0	0	1	1	1	5	8
6	0	1	1	0	9	1	0	0	1	0	1	1	0	6	9
7	0	1	1	1	10	1	0	1	0	0	1	0	1	7	10
8	1	0	0	0	11	1	0	1	1	0	1	0	0	8	11
9	1	0	0	1	12	1	1	0	0	0	0	1	1	9	12
10	1	0	1	0	13	x	x	x	x	x	x	x	x	10	13
11	1	0	1	1	14	x	x	x	x	x	x	x	x	11	14
12	1	1	0	0	15	x	x	x	x	x	x	x	x	12	15
13	1	1	0	1	16	x	x	x	x	x	x	x	x	13	16
14	1	1	1	0	17	x	x	x	x	x	x	x	x	14	17
15	1	1	1	1	18	x	x	x	x	x	x	x	x	15	18

Circuit Diagram: