



# SLIIT

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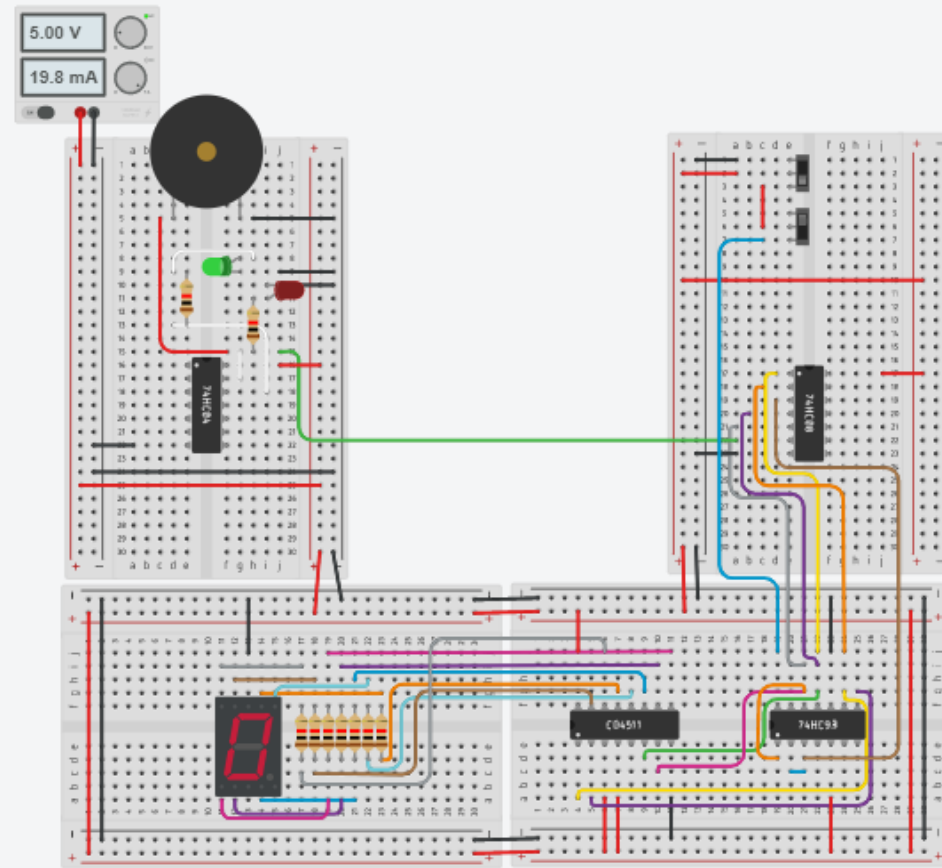
Digital Electronics

Digital circuit for an elevator which can carry a maximum of 9 people.

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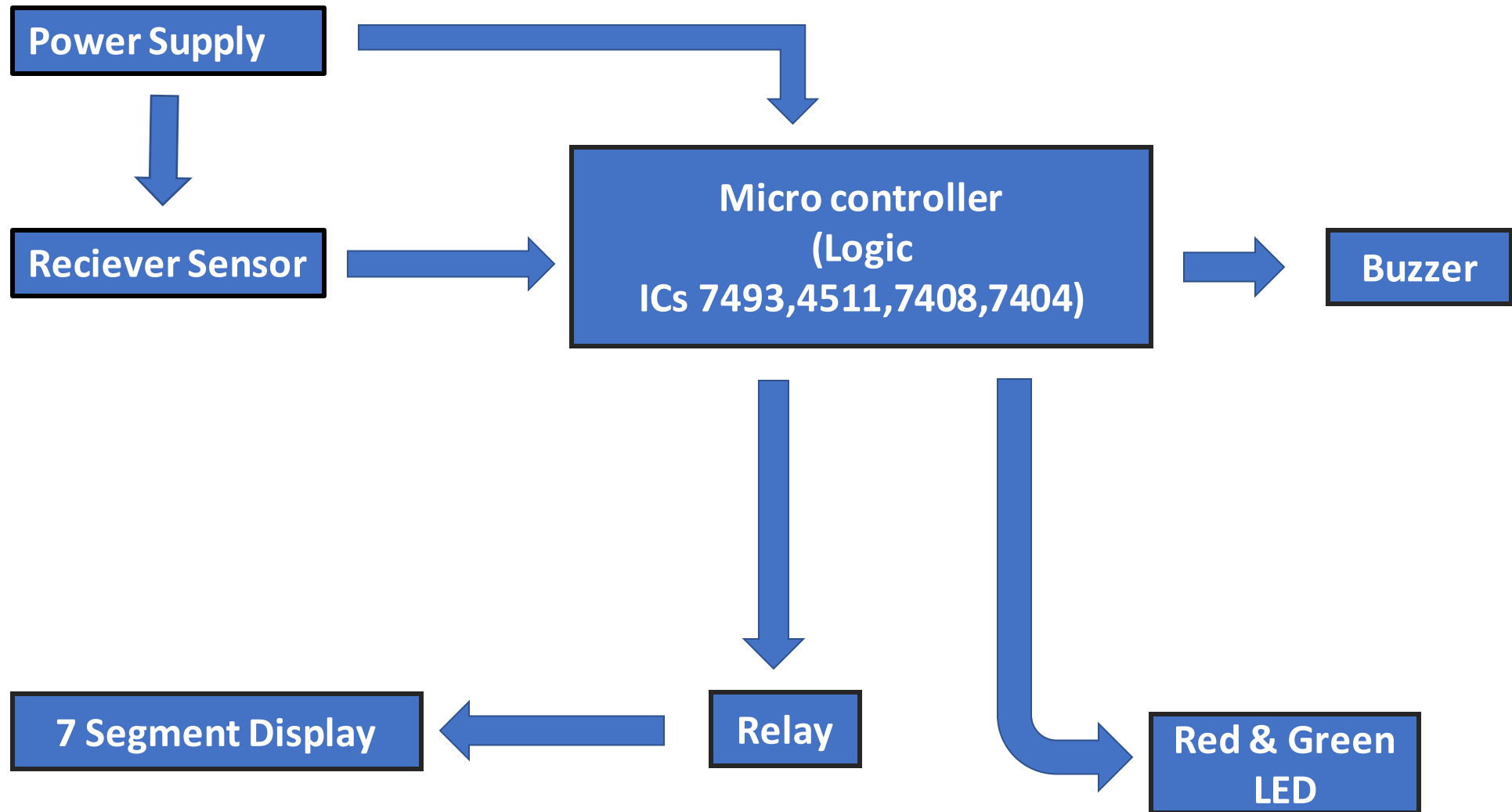
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Photograph of our circuit build on  
Tinkercad

# Block diagram of the circuit



**93A**  
**Count Sequence**  
**(See Note C)**

Count	Outputs			
	Q <sub>D</sub>	Q <sub>C</sub>	Q <sub>B</sub>	Q <sub>A</sub>
0	L	L	L	L
1	L	L	L	H
2	L	L	H	L
3	L	L	H	H
4	L	H	L	L
5	L	H	L	H
6	L	H	H	L
7	L	H	H	H
8	H	L	L	L
9	H	L	L	H
10	H	L	H	L
11	H	L	H	H
12	H	H	L	L
13	H	H	L	H
14	H	H	H	L
15	H	H	H	H

- 
- Turn on the power supply and receiver detect the object moving within the respective range. Then it gives high(1) voltage pulse to input A in 7493 IC in the microcontroller.
  - We use 7493 as 4-bit binary counter, therefore we should connect input B to QA. After the receiving 1st clock pulse QA will be high(H) and QB,QC,QD outputs are stay low(L).

- The CD4511 decoder receive the BCD code to inputs(A,B,C,D) and generates the necessary signals in output ports(a,b,c,d,e,f,g) to appropriate led segment(Table 1).

- Then that outputs taken as inputs of 7 segment display through relay because to protect from electricity vulnerabilities. So then it will display the respective decimal value which is '1' .

**Table 1: BCD outputs and corresponding digits**

Clock Pulse	BCD4510 output/ BCD4511 input				BCD4511 output							7-Segment Displayed Digit
	D	C	B	A	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	0	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

- So likewise, when moving objects through receiver, continuously it will produce clock pulse and count up to 9.

Where the value of QA(outputbit 0) & QD(outputbit 3) become **High(1)** in the 7493 IC. Both input2A & Input2B in the 7408 IC that has been connected will be **High(1)**. So then it output also **High(1)**. After that the Red bulb will be turned on and the value of buzzer will be positive. Therefor buzzer will switch on & alarm will ring , With the connection of the output2 of 7408 IC to the input of 7404 IC; the green bulb in there will be switched off. (with the switching on the red bulb)

93A

Reset/Count Function Table

Reset Inputs		Outputs			
R0(1)	R0(2)	QD	QC	QB	QA
H	H	L	L	L	L
L	X	COUNT			
X	L	COUNT			

Note A:

Output Q<sub>A</sub> is connected to input B for BCD count.

Note B:

Output Q<sub>D</sub> is connected to input A for bi-quinary count.

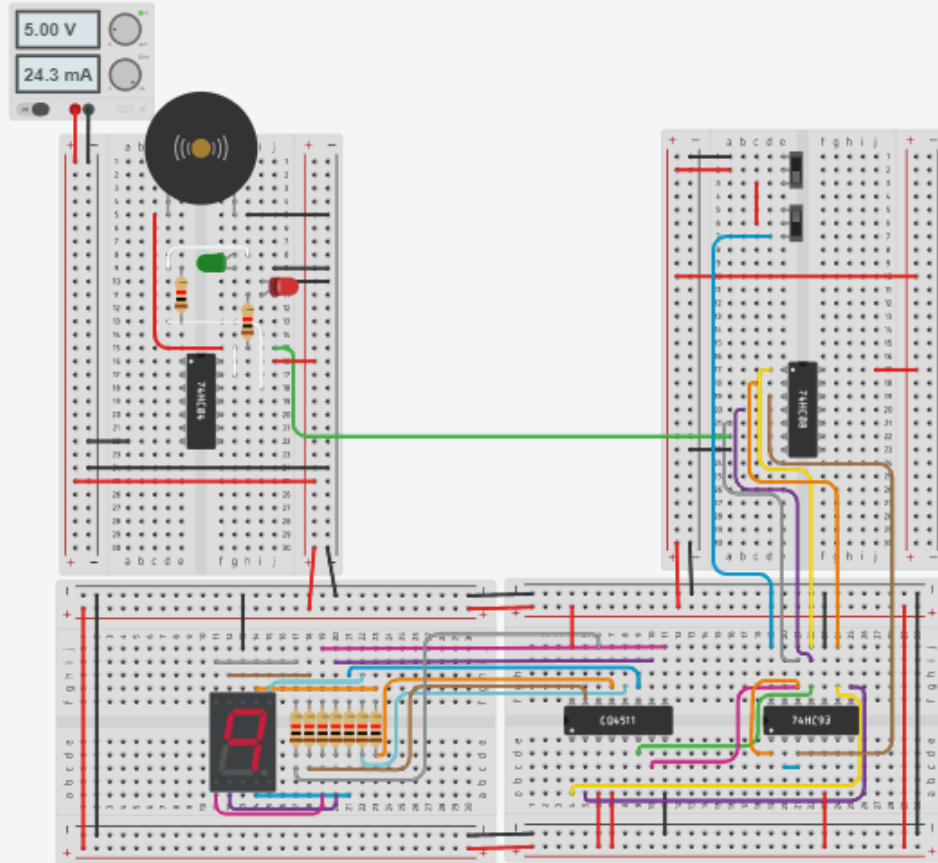
Note C:

Output Q<sub>A</sub> is connected to input B.

Note D:

H = High Level, L = Low Level, X = Don't Care.

After that QB & QD will be **High(1)** when pulse reached up to 10. Then Inputs(Input 1A & Input 1B) in 7408 also **High(1)**. Therefor 7408 output 1 also **High(1)**. After that both values of reset pins in 7493 IC becomes **High(1)** because 7408 output 1 has been connected to it. Then reset bits which is R1 and R2 becomes **High(1)** but it works as a NAND gate. So the output of it become low(0) and Q0 , Q1 , Q2 , Q3 also will become low(0). Therefor Inputs of the 4511 IC also will become low(0) . So 0 will display in the 7 segment display.





# Contributions

- Member = 1

- Implementing Buzzer

Buzzer must be turn on if the people count is more than or equal to 9. Therefore when the 7493 input becomes 9th clock pulse, if we check the output of QA,QB,QC,QD is 1,0,0,1. So then its have a unique output. Then took the output of QA and QD through AND gate because all the other outputs of QA,QD is 1,0 or 0,1. That's why I choose AND to implement the logic. Output of AND gate is always equal to 1 when it reached 9, So I took it as buzzer input to turn on.



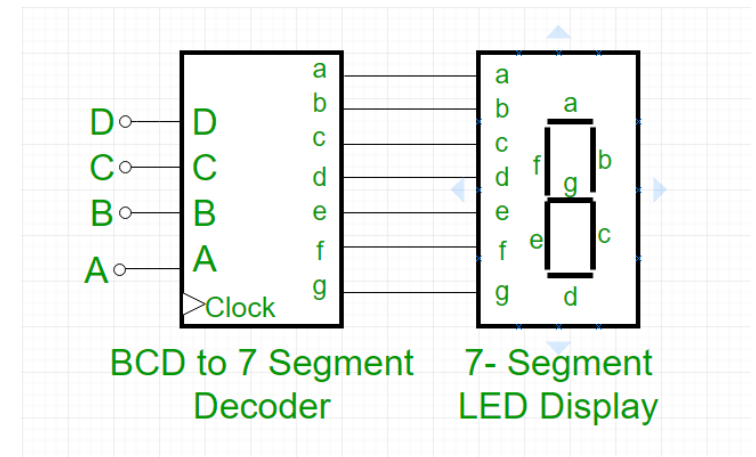
# Contributions

- Member = 2
  - Implementing 7 segment display
1. **Binary Coded Decimal** encoding scheme each of the decimal numbers(0-9) is represented by its equivalent binary pattern
  2. Two types of seven segment LED display
    - Common Cathode Type
    - Common Anode Type

When we directly supply to the power to the parts at LED, the 7th segment display will not work.

Firstly our decimal point is change to the it's equal signals of BCD, BCD will translate to the 7th segment decoder.

A	B	C	D	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



# Contributions

Member = 3

- Implementing Counter using 7493 IC

Non-symmetric counter is a calculation which haven't a clock beat because of that. It is not change the Exactly value of the flip-flop. 7493 Ic is a Non-symmetric counter. This Ic shows a real value of the digital column.

# Contributions

- Member = 4
- Implementing the Red and Green light logic

The green bulb is on until, value of the 7th segment is 8. After that if we switch off and then it will on.

Red LED must be turn on if the people count is more that or equal to 9. And also if again we off & on the Switch ,the circuit will reset and the green bulb will on.