4 Bit Arithmetic and Logical Unit

DE Lab Project Report

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1. Problem Identification

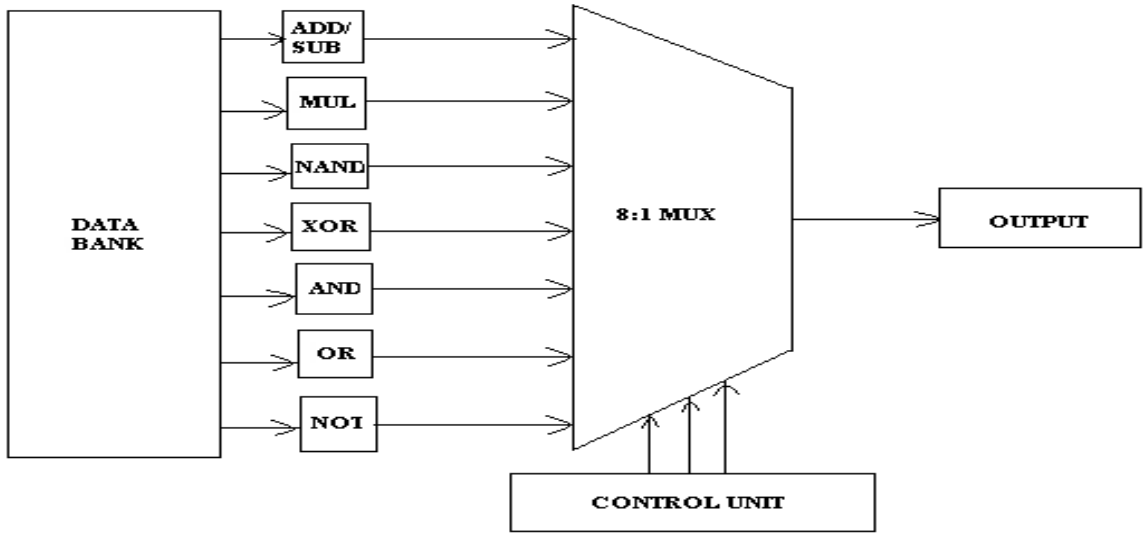
Performing different arithmetic and logical operations (Addition, Subtraction, And, Or, Nand, Nor) using IC's and mux for a 4 bit signal.

2. Features

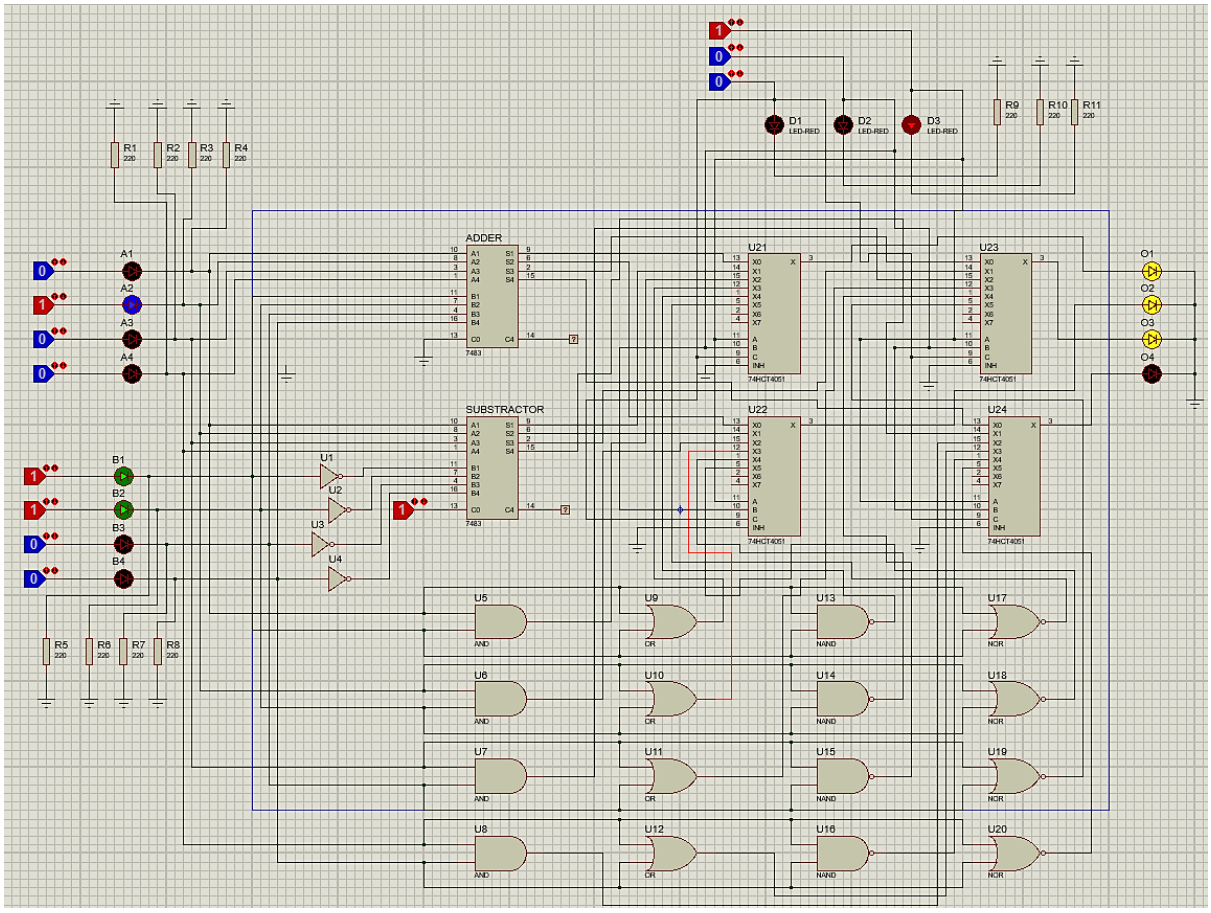
1) Performs different type of operations:-
   a) Addition
   b) Substation
   c) And
   d) Or
   e) Nand
   f) Nor
2) Operation can be performed on a 4 bit signal.
3) Two different signals are inputted from 8 switches.
4) Selections can be made using 3 different switches.
5) Output is performed in from of LED.

3. Design Flow

Block Diagram



Circuit Diagram



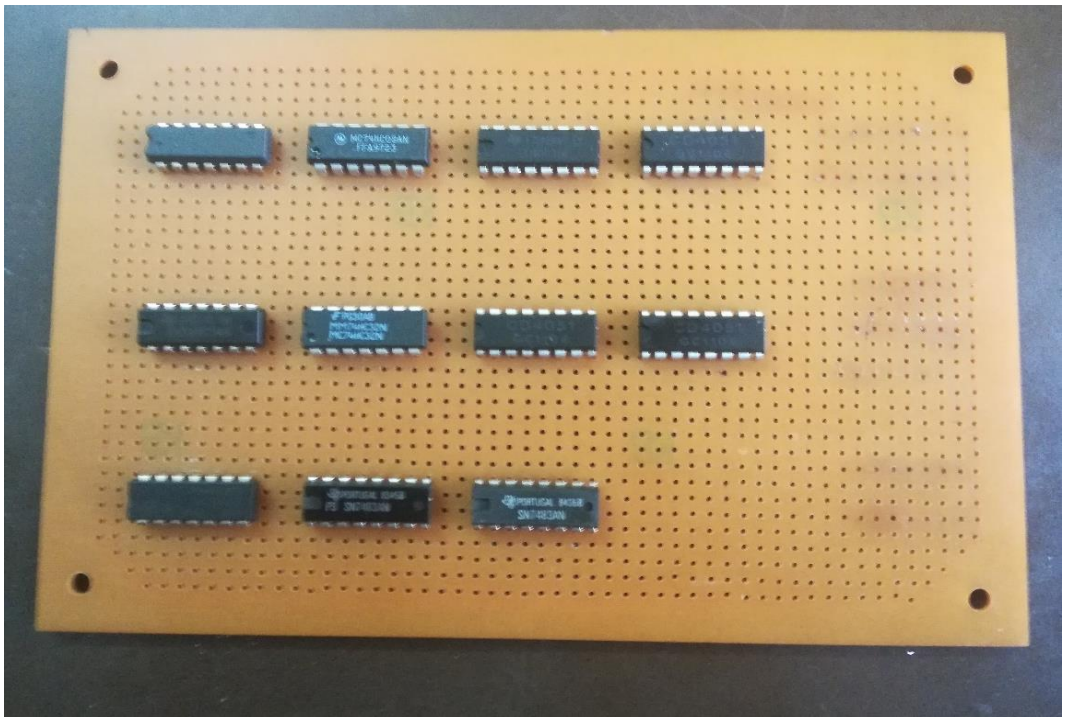
Materials

COMPONENT	QUANTITY	SPECIFICATION
7400	1	QUAD 2-input Nand gate
7402	1	QUAD 2-input Nor gate
7404	1	Hex Inverter
7408	1	QUAD 2-input And gate
7432	1	QUAD 2-input Or gate
7483	2	4-BIT BINARY FULL ADDER
CD4051	4	Single 8-Channel Analog Multiplexer
SWITCH	12	switch
LED	15	Red, yellow and green led
BATTERY	1	9 v battery

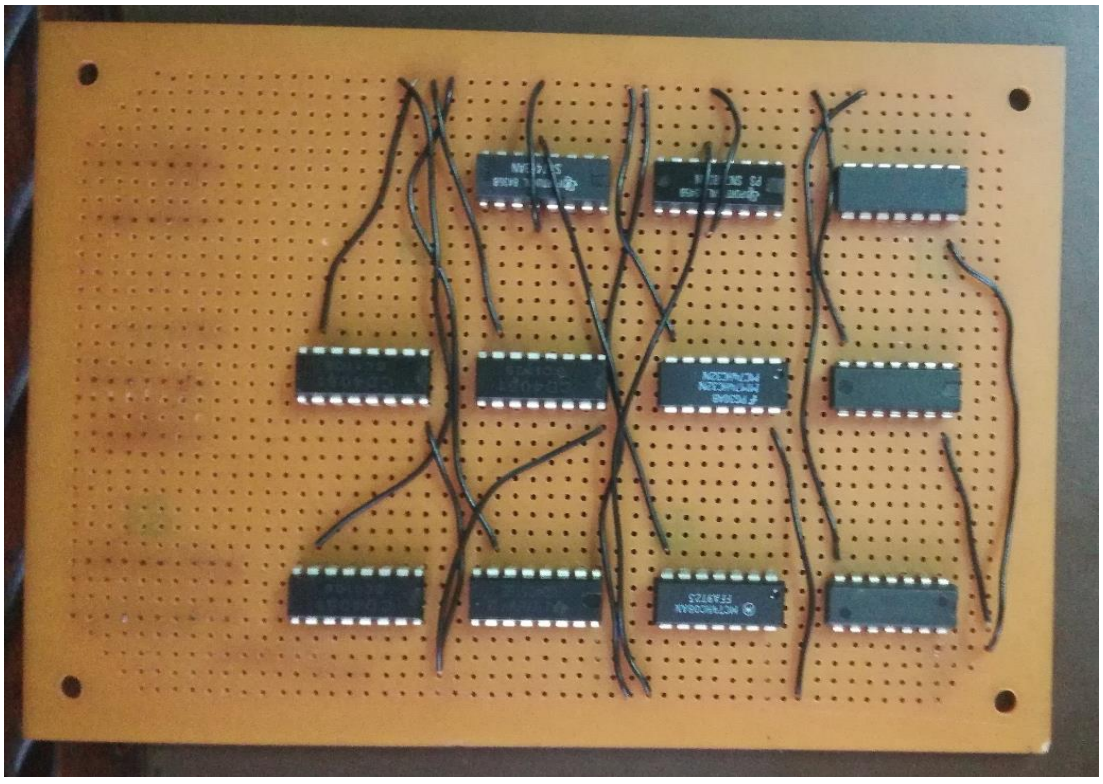
4. Outcome

Steps of Circuit Completion

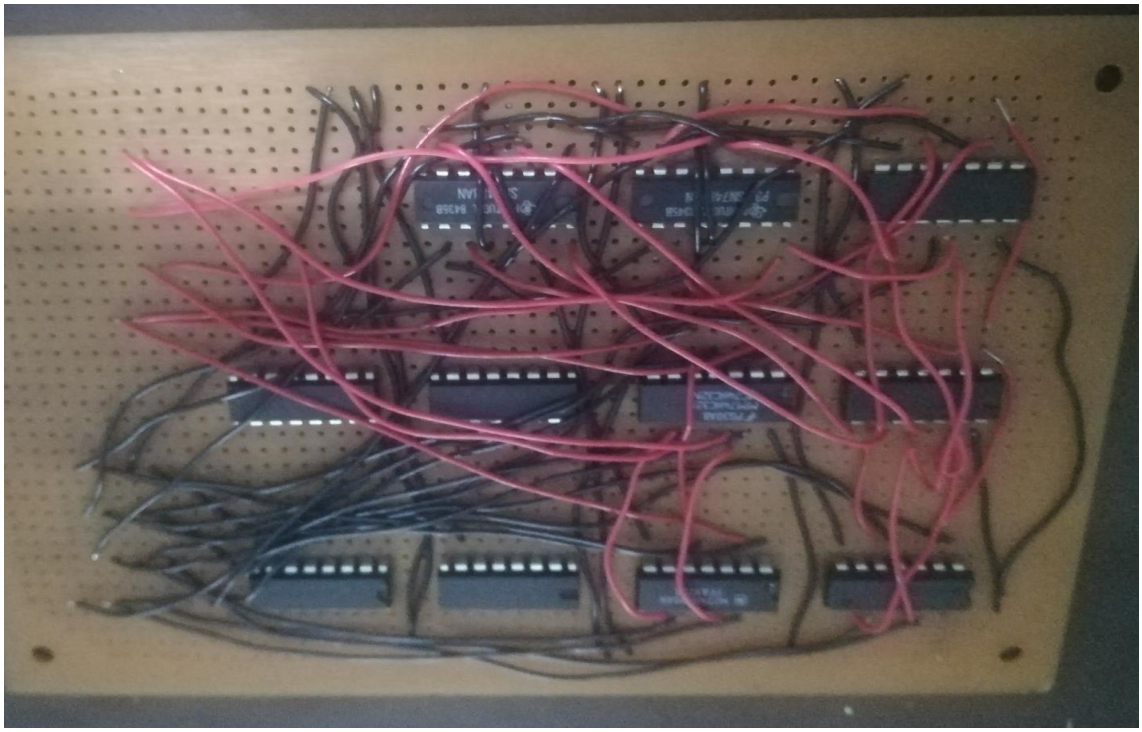
1) IC’s were connected on PCB and each terminal was soldered,



2) Soldering was done and IC’s were powered by connect gnd and vcc;



3) Wires containing Signal A and Signal B was soldered to every IC.



4) Led panel was make along with switch and n/off switch.

5. Cost Analysis

S. No.	Component / Material	Price (in Rs.)
1.	7400	15 * 1
2.	7402	15 * 1
3.	7404	20 * 1
4.	7408	20 * 1
5.	7432	20 * 1
6.	7483	120 * 2
7.	4051	70 * 4
8.	PCB	50 * 1
9.	Switch	10 * 12
10.	led	1 * 20
Total		780/-