

24. FULL SUBTRACTOR

EXP.NO: 24

AIM: To design and implement the full subtractor using Logisim simulator.

PROCEDURE:

- 1) Pick and place the necessary gates.
- 2) Insert 3 inputs into the canvas.
- 3) Connect the inputs to the XOR gate, AND gate and OR gate.
- 4) Insert 2 outputs into the canvas.
- 5) Make the connections using the connecting wires.
- 6) Verify the truth table.

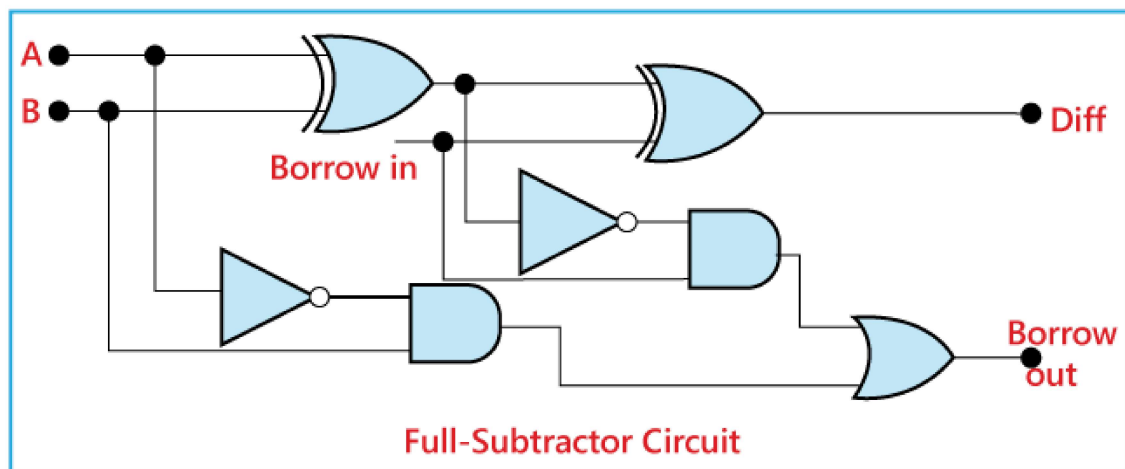
TRUTH TABLE:

INPUT			OUTPUT	
A	B	Bin	D	Bout
0	0	0	0	0
0	0	1	1	1
0	1	0	1	1
0	1	1	0	1
1	0	0	1	0
1	0	1	0	0
1	1	0	0	0
1	1	1	1	1

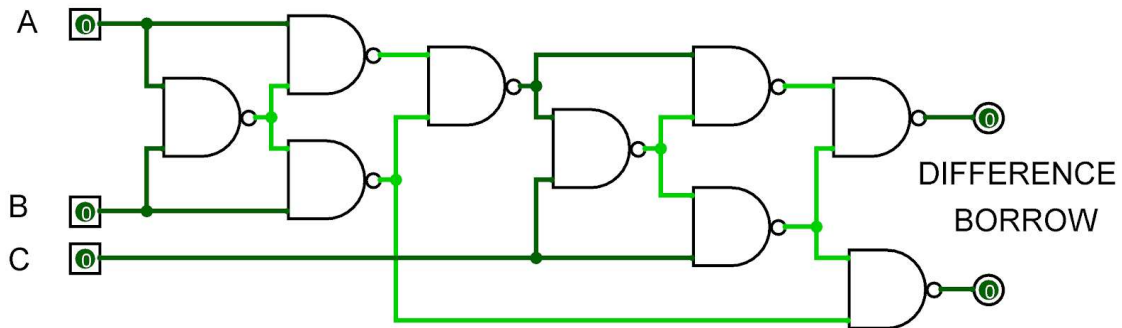
$$\text{Diff} = (A \oplus B) \oplus \text{'Borrow in'}$$

$$\text{Borrow} = A'.B + (A \oplus B)'$$

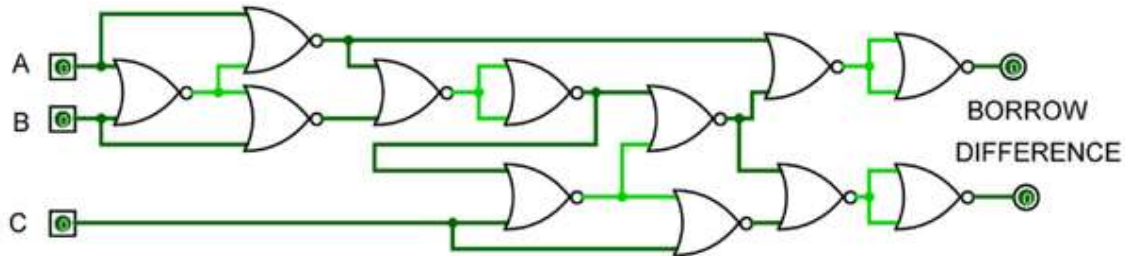
Logic Diagram:



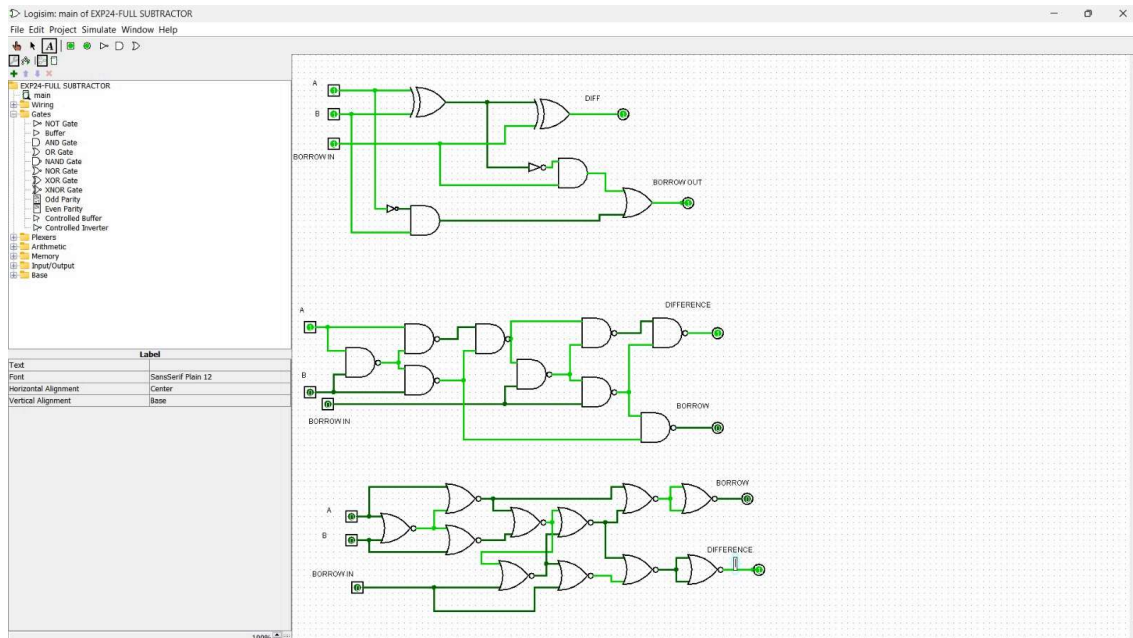
Full Subtractor using NAND Gates:



Full Subtractor using NOR Gates:



OUTPUT



RESULT: Thus full subtractor has been designed and implemented successfully using logisim simulator.