

## **TWO BIT HALF SUBTRACTOR**

**EXP.NO: 22**

### **AIM:**

To design and implement the two bit half subtractor using Logisim simulator.

### **PROCEDURE:**

- 1) Pick and place the necessary gates.
- 2) Insert 2 inputs into the canvas.
- 3) Connect the inputs to the OR gate, AND gate and NOT gate.
- 4) Insert 2 outputs into the canvas.
- 5) Make the connections using the connecting wires.
- 6) Verify the truth table.

### **TRUTH TABLE:**

A	B	Diff	Borrow
0	0	0	0
0	1	1	1
1	0	1	0
1	1	0	0

$$\text{Diff} = A'B + AB'$$

$$\text{Borrow} = A'B$$

## OUTPUT

The screenshot displays the Logisim software interface. The top menu bar includes File, Edit, Project, Simulate, Window, and Help. The left sidebar shows a project tree with a hierarchy: Untitled 2\* > main > Wiring > Gates. The main workspace contains a circuit diagram with two 8-bit input buses (labeled 00000000 and 00000001) connected to an OR gate and an AND gate. The AND gate has an inverter on its second input. The OR gate's output is connected to an 8-bit output bus (00000000), and the AND gate's output is connected to another 8-bit output bus (00000000). The bottom status bar shows 100% zoom.

Pin	
Facing	East
Output?	No
Data Bits	1
Three-state?	No
Pull Behavior	Unchanged
Label	
Label Location	West
Label Font	SansSerif Plain 12

**RESULT:** Thus 2-bit half subtractor has been designed and implemented successfully using logisim simulator.