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BCS-2D1
Lab Task # 5

Lab 5

To Demonstrate the Working of Binary Adders

Note: You may draw all the logic diagrams with hand and paste the pictures here or on logicly software with your name, roll number & section mentioned in your workspace. Make sure that all of your connections are clearly visible and distinguishable.

Tasks

1. **Construct a logic circuit for half and full adder with the help of truth table. Also write the Boolean expression for output(s).**

Half Adder

a) Truth Table

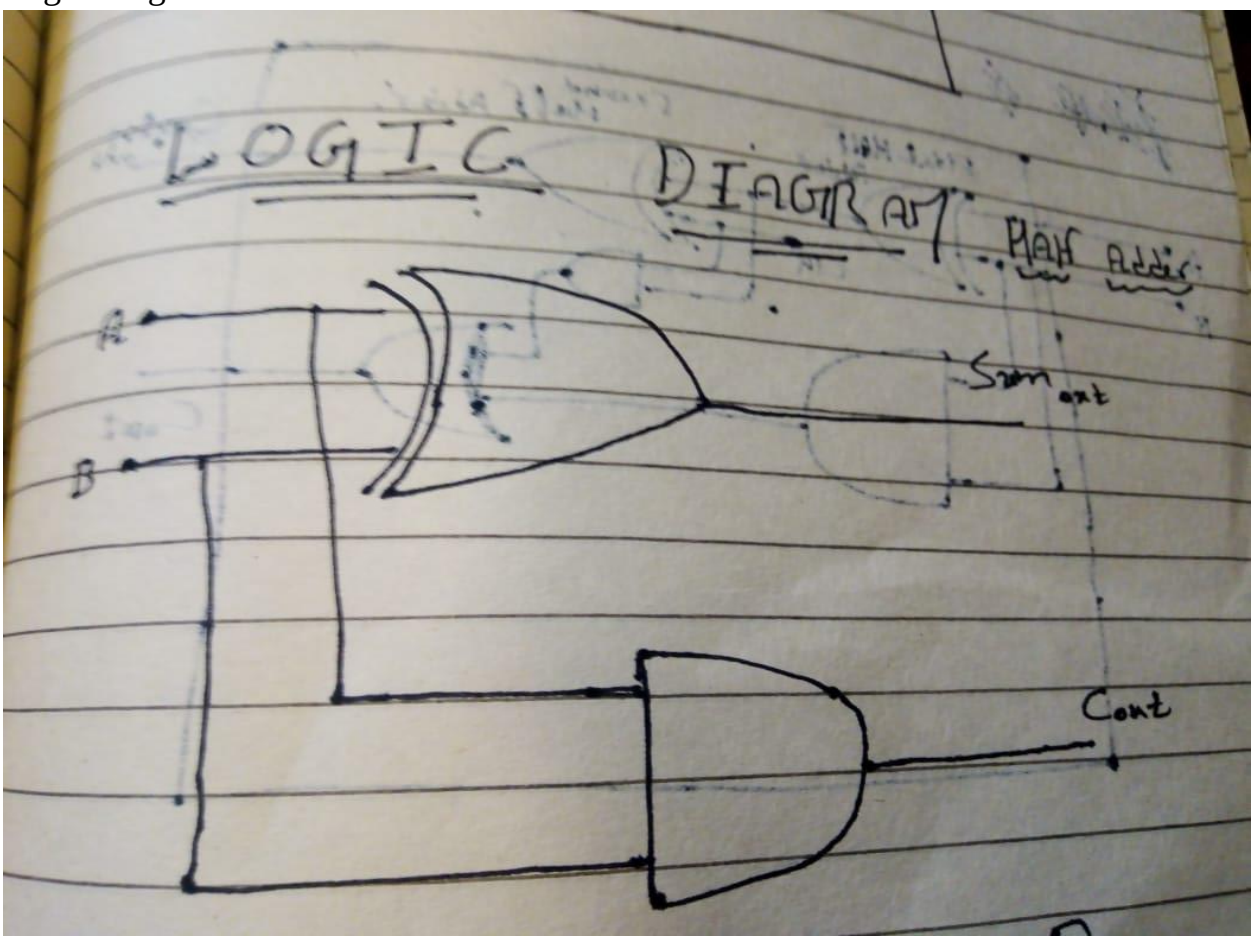
A	B	SUM	COUT
0	0	0	0
0	1	1	0
1	0	1	0
1	1	0	1

b) Boolean Expression (Simplified)

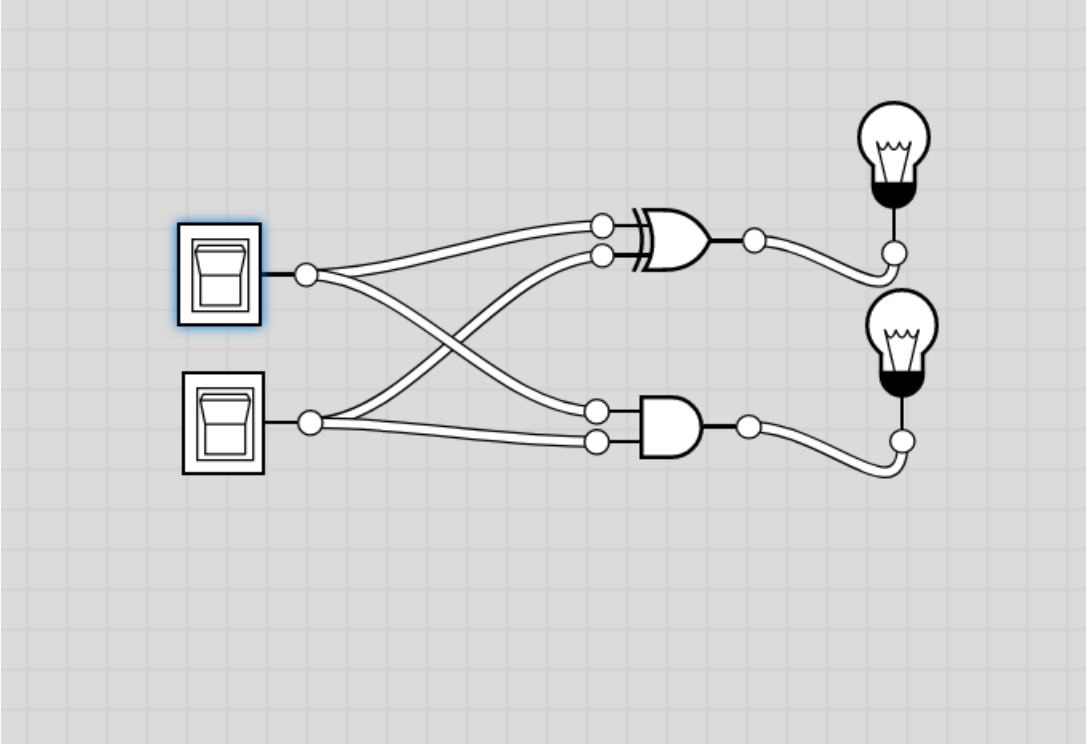
SUM: $A \oplus B = A \text{ XOR } B$

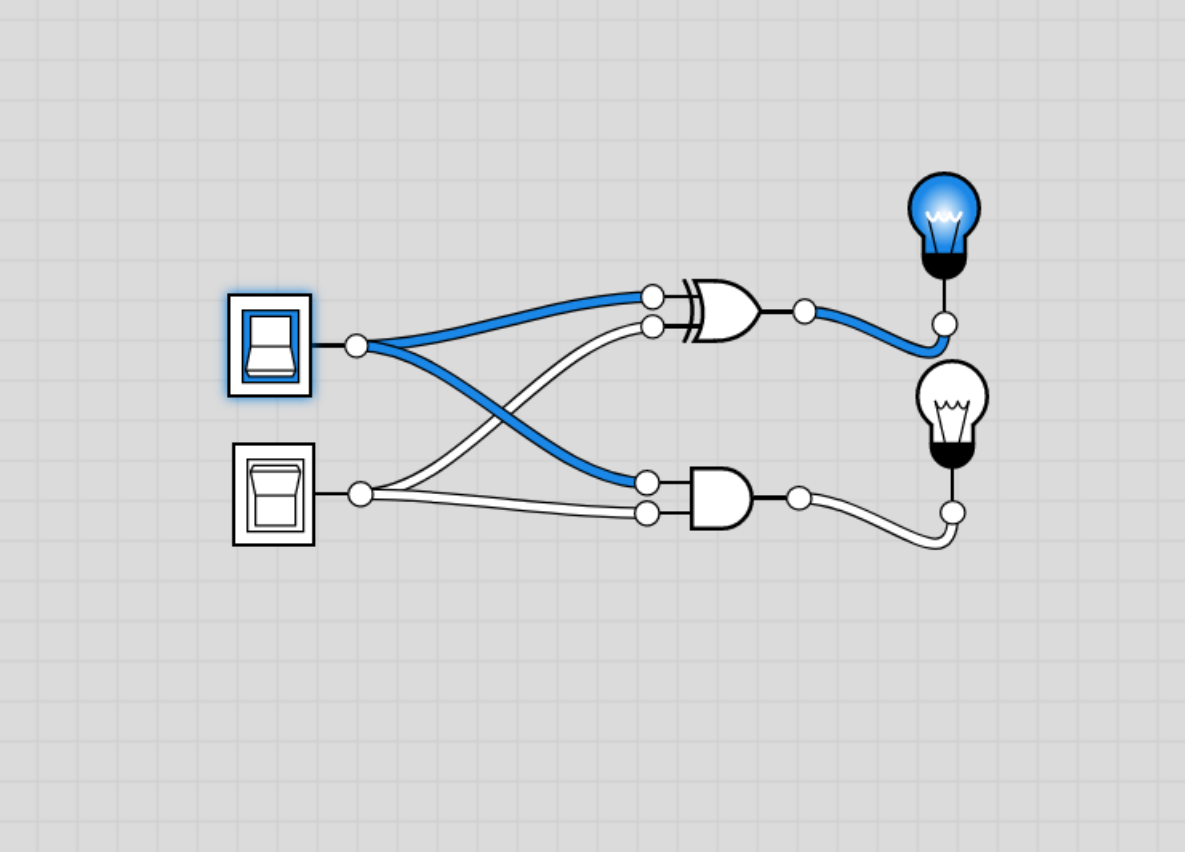
CARRY: A . B = A AND B

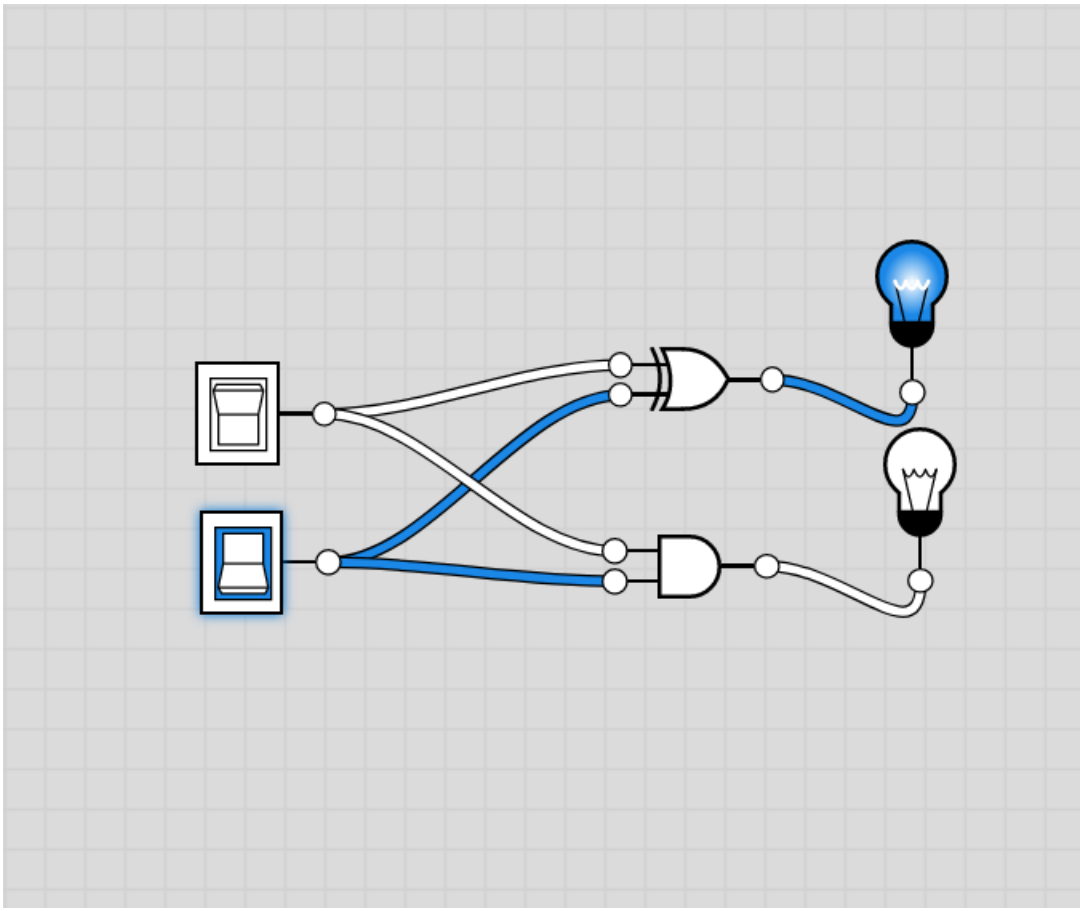
c) Logic Diagram

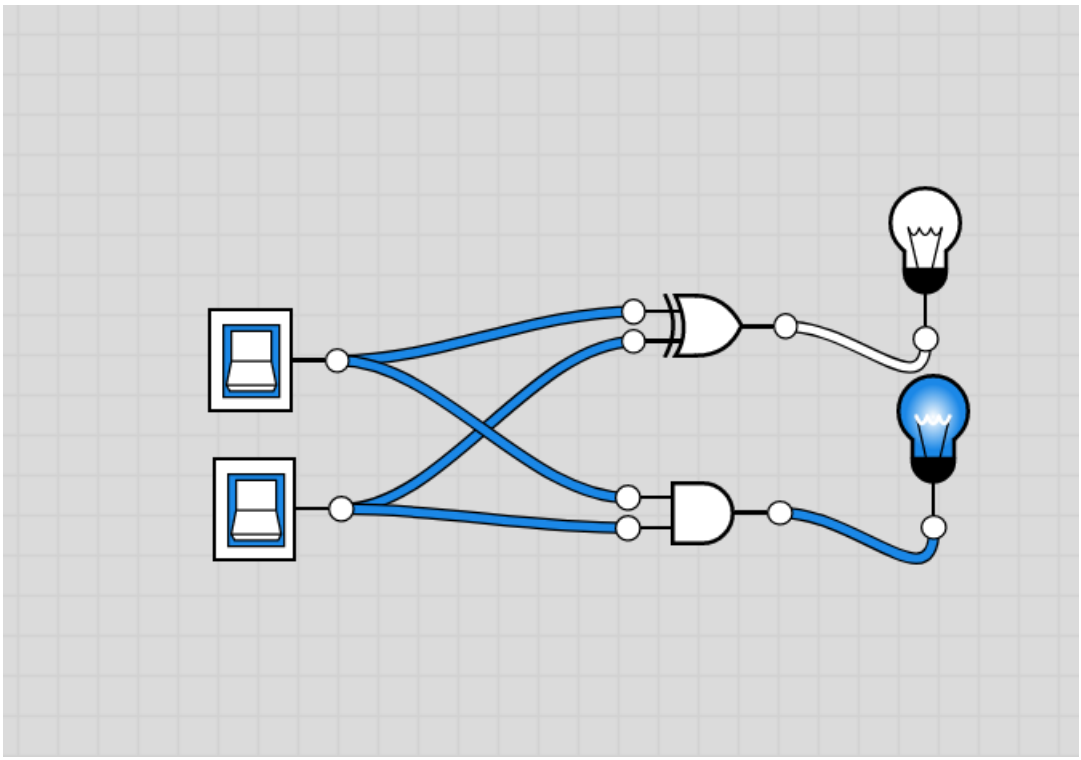


d) Software Simulation (Show here your results for each combination that gives a high output)









Full Adder

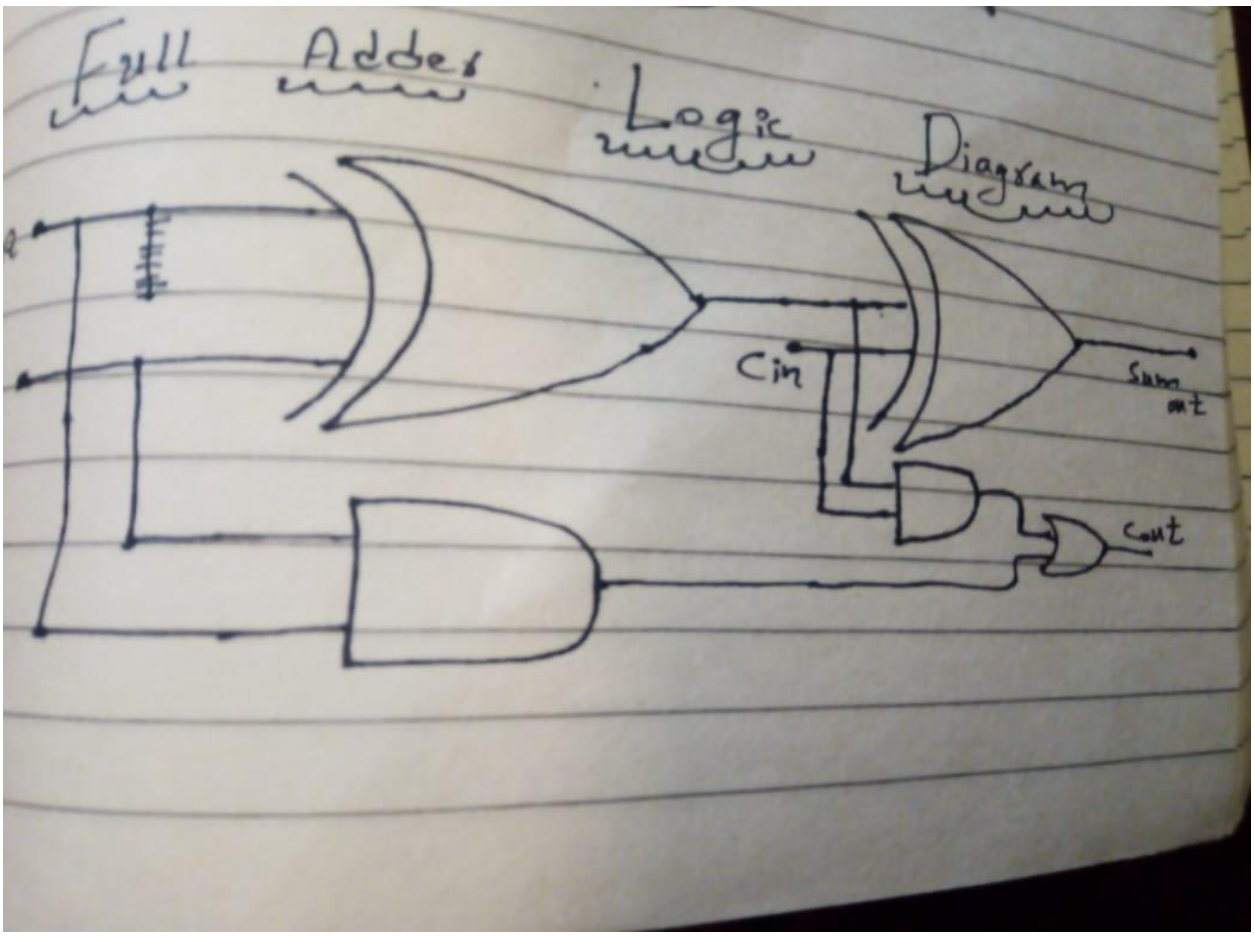
a) Truth Table

A	B	CIN	SUM	COUT
0	0	0	0	0
0	0	1	1	0
0	1	0	1	0
0	1	1	0	1
1	0	0	1	0
1	0	1	0	1
1	1	0	0	1
1	1	1	1	1

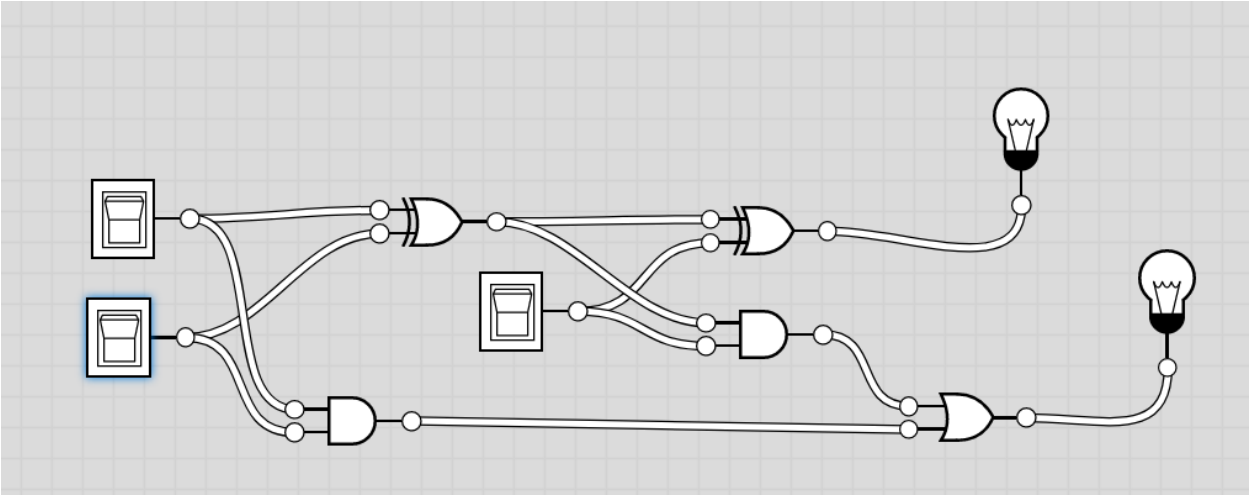
b) Boolean Expression (Simplified)

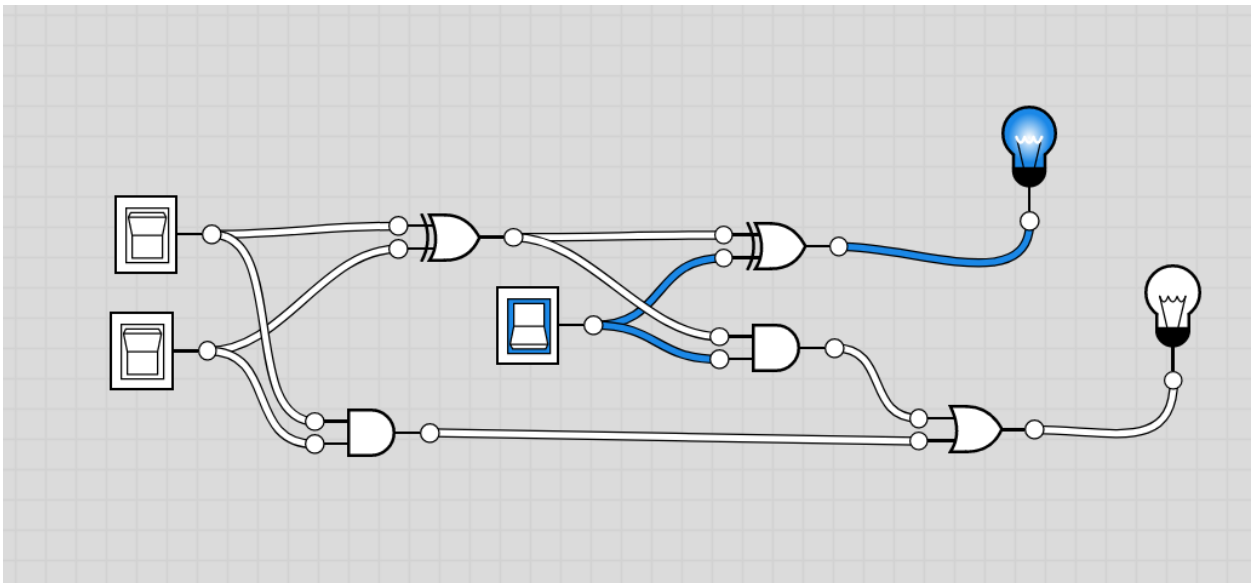
(A XOR B) XOR CIN = $(A \oplus B) \oplus CIN$

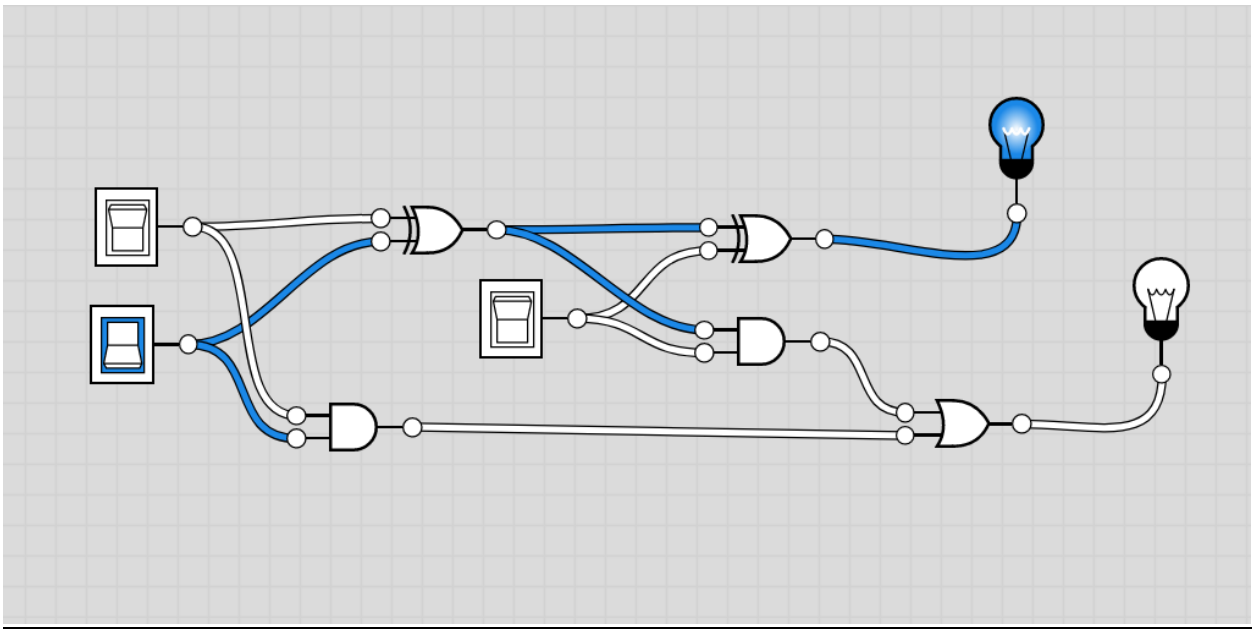
c) Logic Diagram

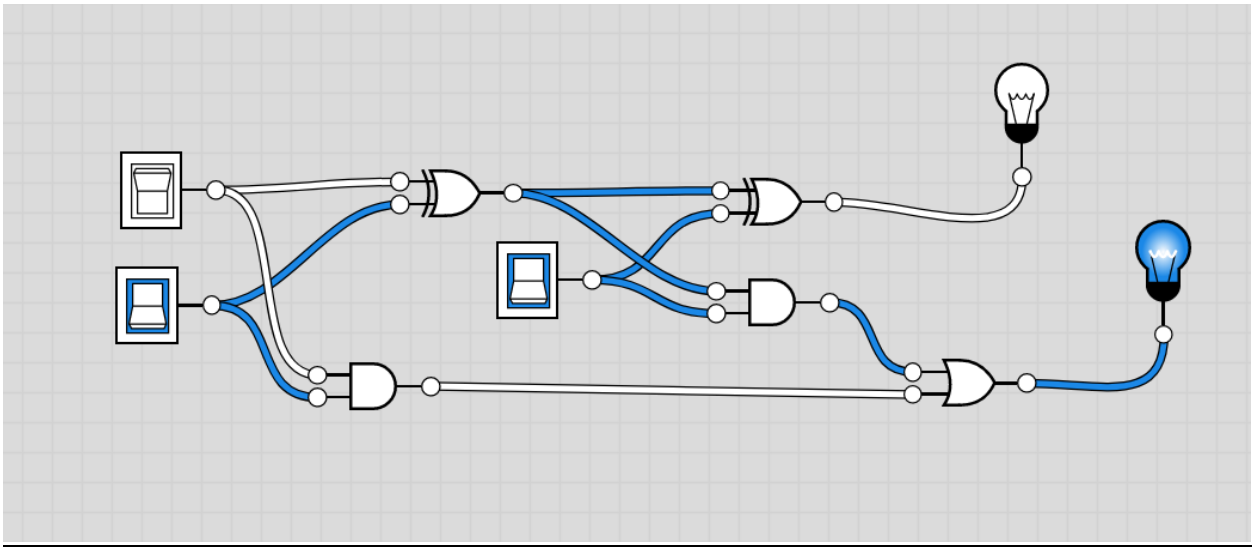


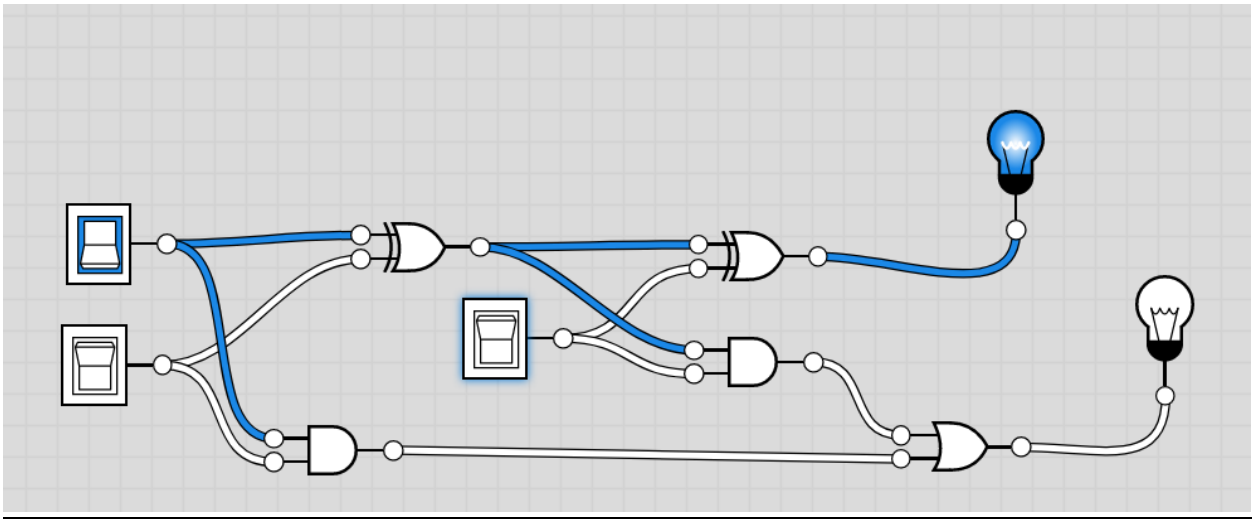
d) Software Simulation (Show here your results for each combination that gives a high output)

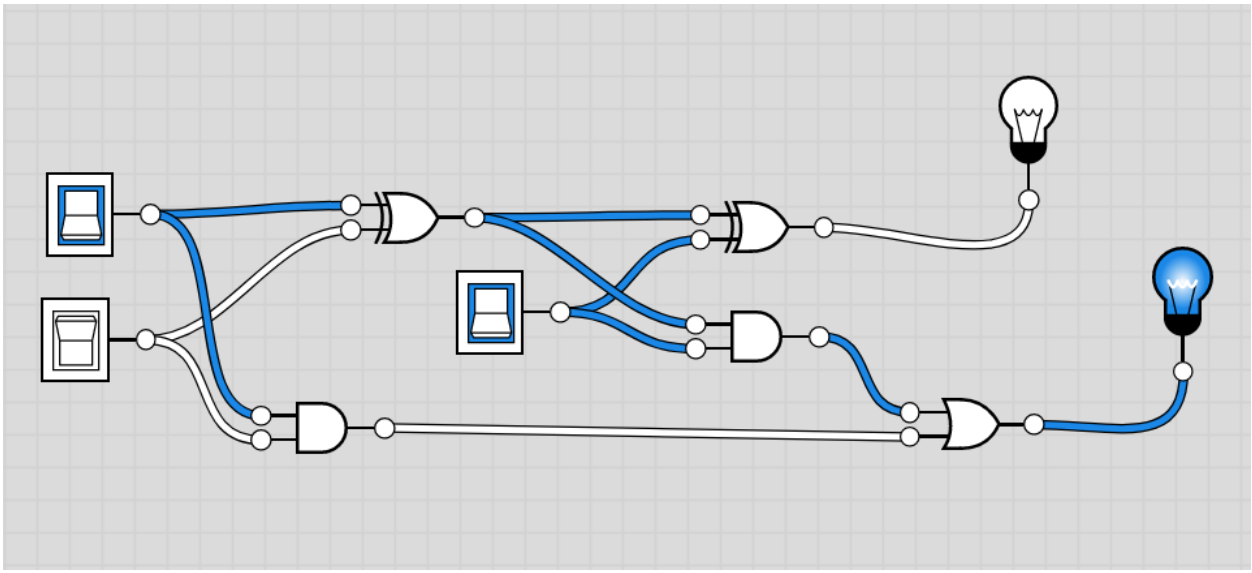


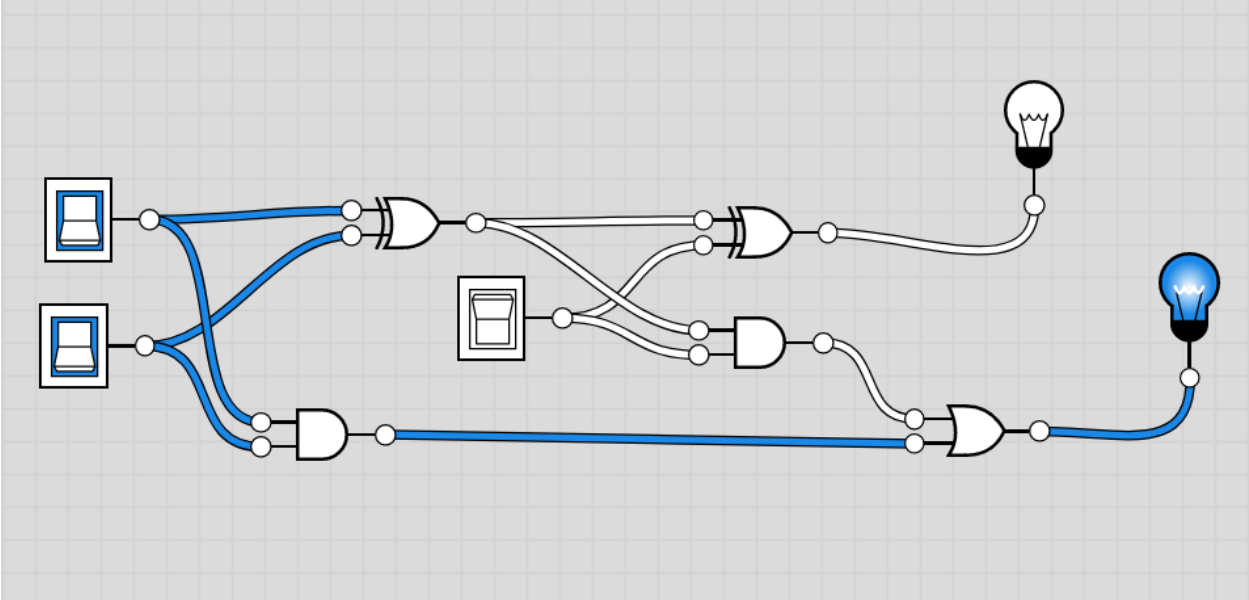


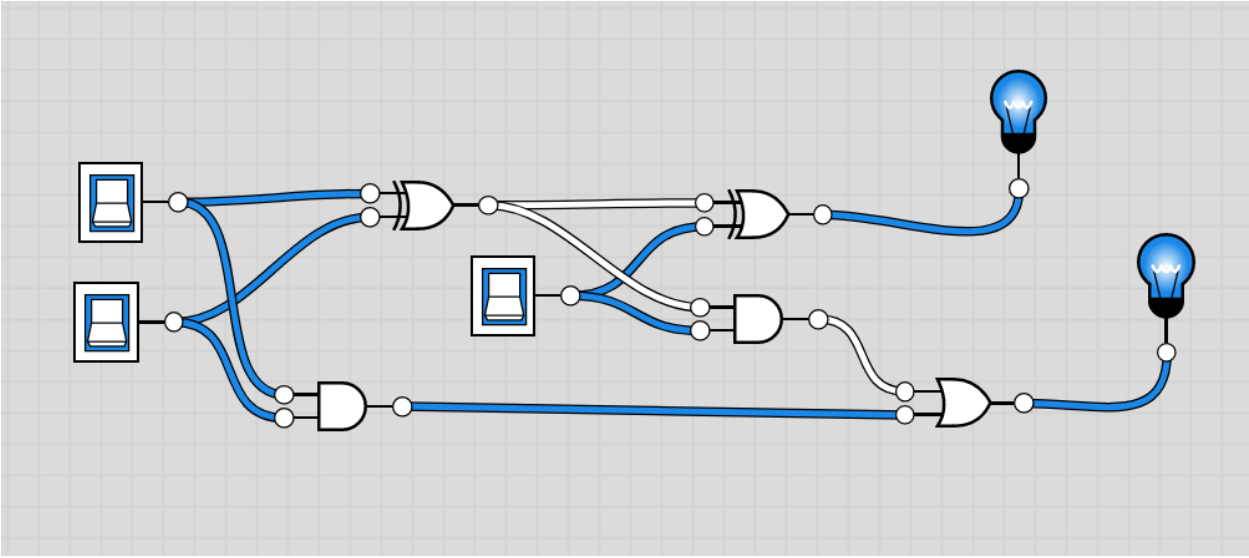












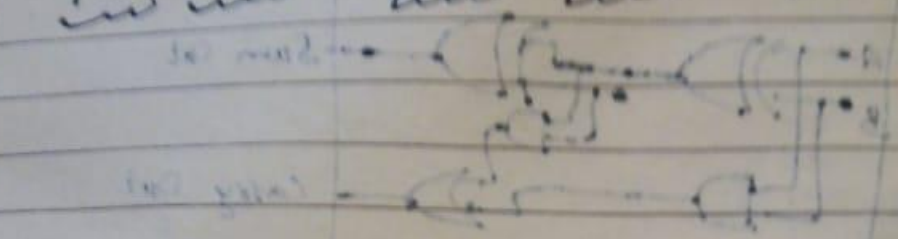
2. **A full adder can be implemented using 2-half adders. Demonstrate the logic diagram for the said circuit. Simulate your circuit for the verification of results.**

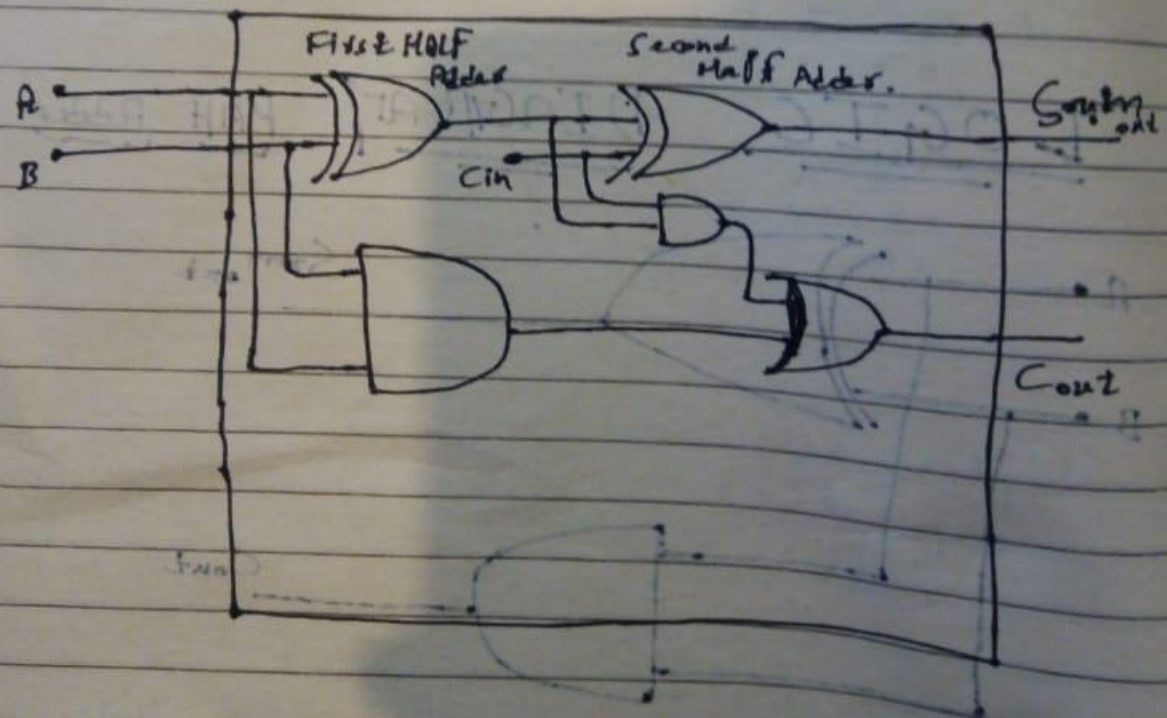
a) Logic Diagram of Full Adder using 2-Half Adders

M T W T F S

Date: __/__/20

Full Adder Using Half Adder





b) Software Simulation (Show here your results for each combination that gives a high output)