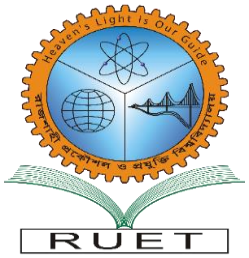

RAJSHAHI UNIVERSITY OF ENGINEERING AND TECHNOLOGY

Course no: CSE 2204

Course Title : Sessional Based on CSE 2203

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Experiment no:5.1.1

Experiment name: Verify the Half Adder Circuit (implementing by basic logic gates)

Objectives :

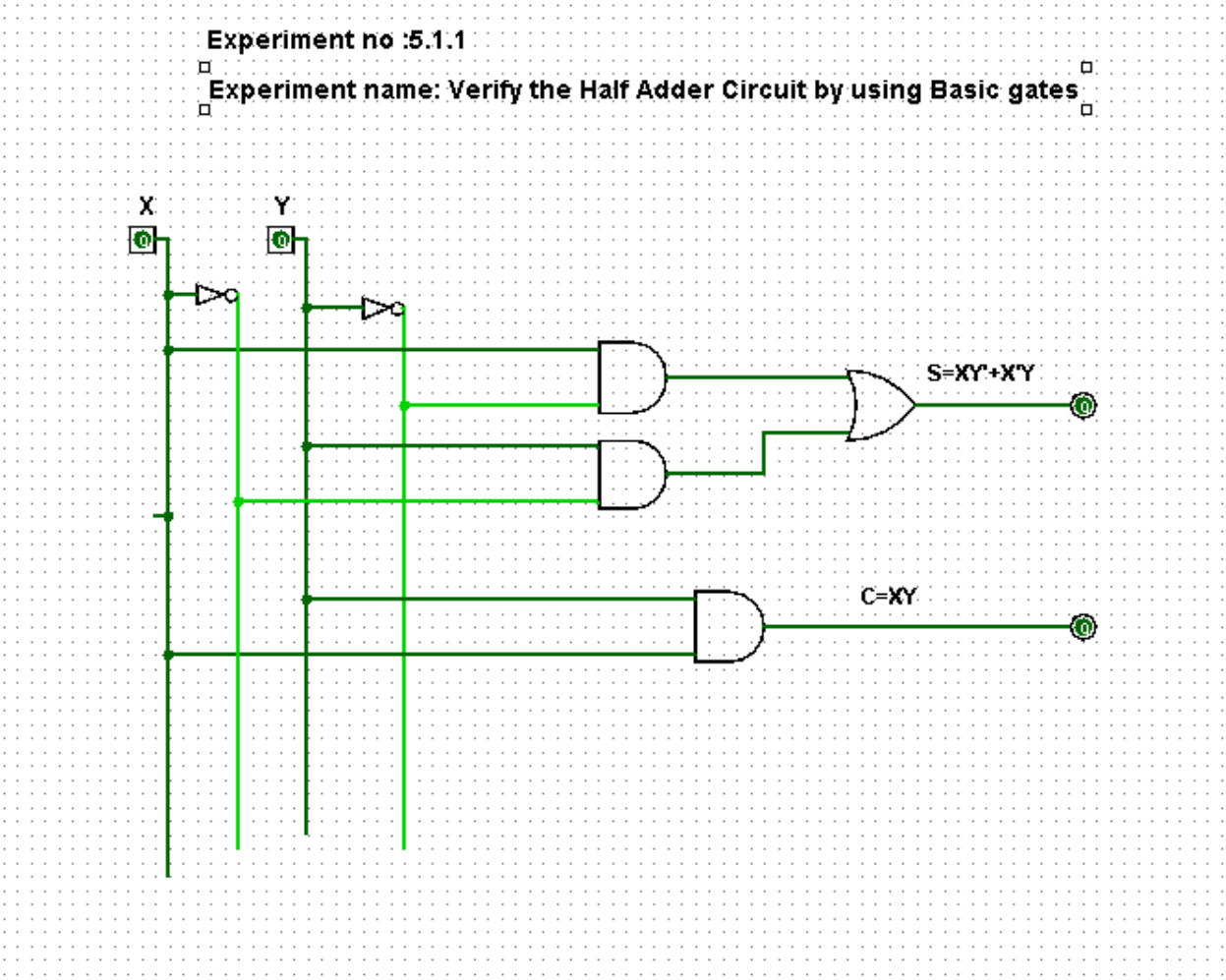
- To learn about Half Adder Circuit
- Implement it by using basic gates
- Draw the truth table and verify the output result

Theory:

A half adder is an electronic circuit that performs the addition two single binary digits and provide the output plus a carry value . It has two inputs called A and B and two outputs S(sum),and C(carry).In this experiment here use basic gates including AND,OR and NOT gate (without using XOR) to implement half adder.

Experimental result analysis:

1.Circuit Diagram:



2.Truth Table:

X	**Y**	**S**(sum)	**C**(carry)
0	**0**	**0**	**0**
0	**1**	**1**	**0**
1	**0**	**1**	**0**
1	**1**	**0**	**1**

Conclusion:

This half adder gate is implemented through logisim software with basic logic gate .By analyzing circuit I get a truth table which is similar the original half adder circuit truth table .That means the experiment finished successfully.

Experiment no:5.1.2

Experiment name: Verify the Half Adder Circuit (implementing by XOR gate)

Objectives :

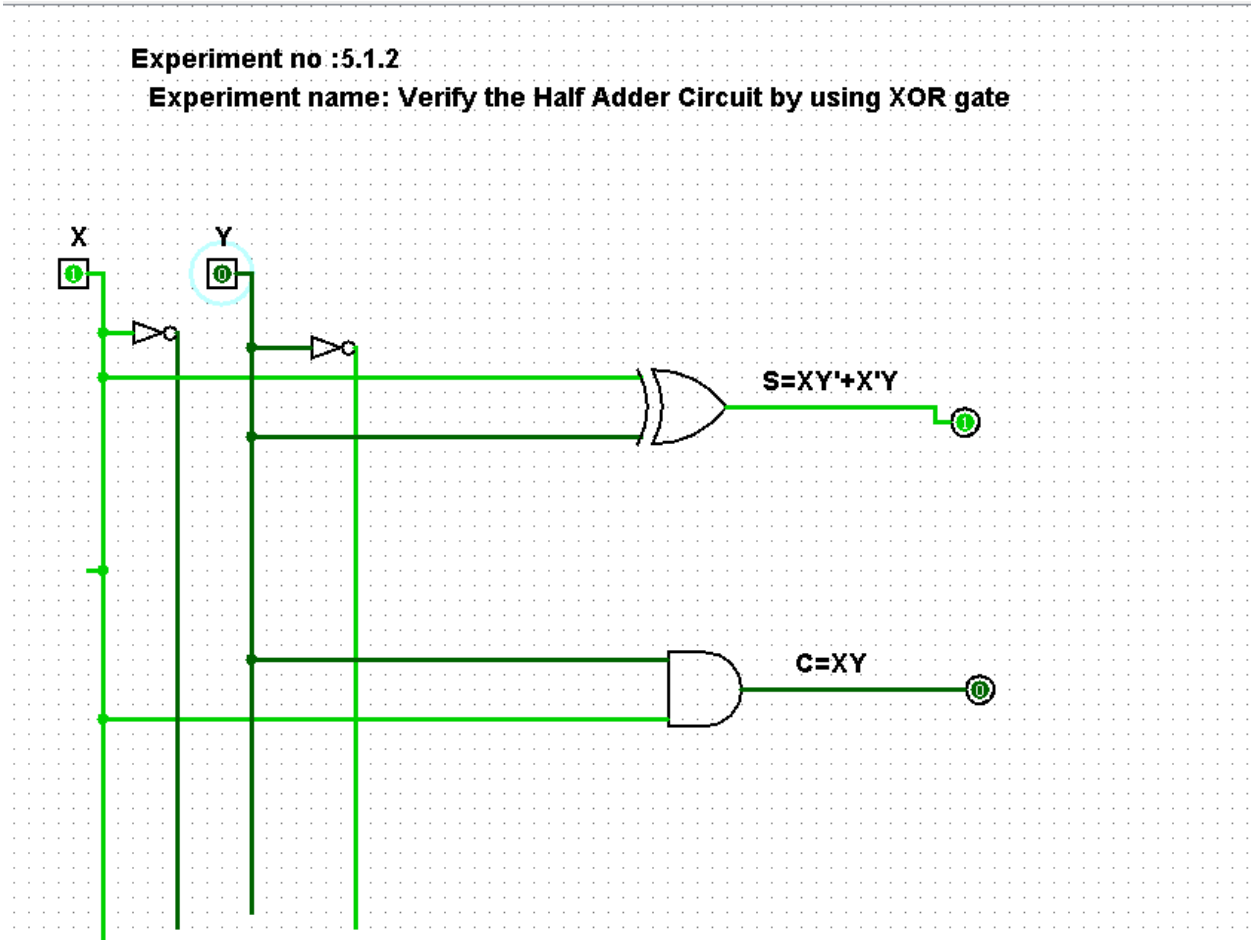
- To learn about Half Adder Circuit
- Implement it by using XOR gate
- Draw the truth table and verify the output result

Theory:

A half adder is an electronic circuit that performs the addition two single binary digits and provide the output plus a carry value . It has two inputs called A and B and two outputs S(sum),and C(carry).In this experiment here uses basic gates(AND,OR,NOT) and XOR gate to implement half adder.

Experimental result analysis:

1.Circuit Diagram:



2.Truth Table:

X	**Y**	**S**(sum)	**C**(carry)
0	**0**	**0**	**0**
0	**1**	**1**	**0**
1	**0**	**1**	**0**
1	**1**	**0**	**1**

Conclusion:

This half adder gate is implemented through logisim software with XOR gate .

By analyzing circuit I get a truth table which is similar the original half adder circuit truth table .That means the experiment finished successfully.

Experiment no:5.2.1

Experiment name: Verify the Full Adder Circuit(Implement by basic logic gates)

Objectives :

- To learn about Full Adder Circuit
- Implement it by using basic gates
- Draw the truth table and verify the output result

Theory:

A Full adder is an electronic circuit that performs the addition three single binary digits and provide the output plus a carry value . It has three inputs called A ,B and C and two outputs S(sum),and C(carry).From Sum of Product equation ,we implement the full adder circuit .

The SOP equation is,

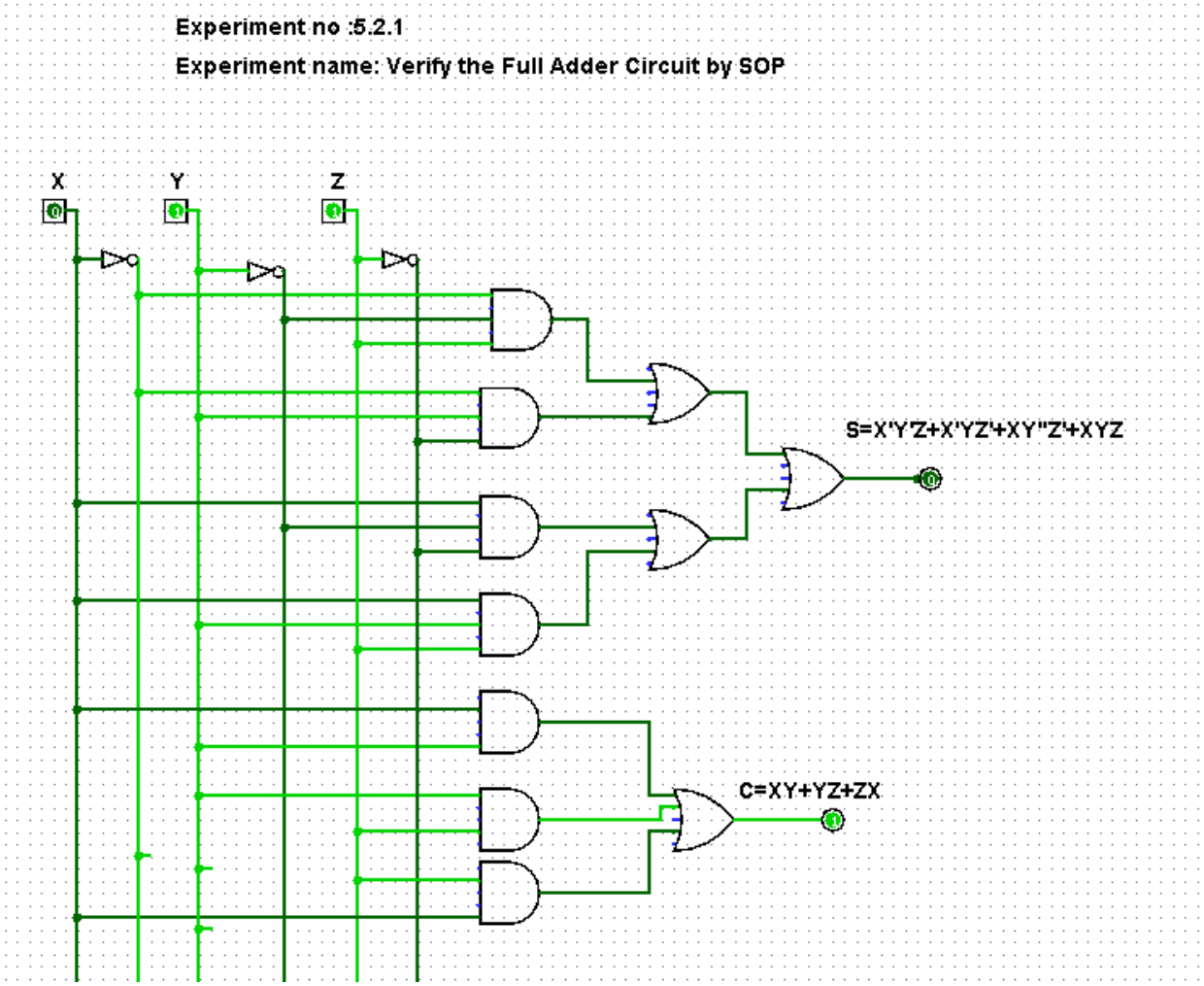
S=X'Y'Z+X'YZ'+XY'Z'+XYZ

and

C=XY+YZ+ZX

Experimental result analysis:

1.Circuit Diagram:



2.Truth Table:

X	Y	Z	S(sum)	C(carry)
0	0	0	0	0
0	0	1	1	1
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

Conclusion:

This Full Adder gate is implemented through logisim software with basic logic gate .By analyzing circuit I get a truth table which is similar the original full adder circuit truth table .Thus the experiment finished successfully.

Experiment no:5.2.2

Experiment name: Verify the Full Adder Circuit(Implement by XOR gates)

Objectives :

- To learn about Full Adder Circuit
- Implement it by using XOR gate
- Draw the truth table and verify the output result

Theory:

A Full adder is an electronic circuit that performs the addition three single binary digits and provide the output plus a carry value . It has three inputs called A ,B and C and two outputs S(sum),and C(carry).

The SOP equation is,

$S=X'Y'Z+X'YZ'+XY'Z'+XYZ$

$=Z(X'Y'+XY)+Z'(X'Y+XY')$

$=Z(X\oplus Y)'+Z'(X\oplus Y)$

$=(X\oplus Y\oplus Z)$

and

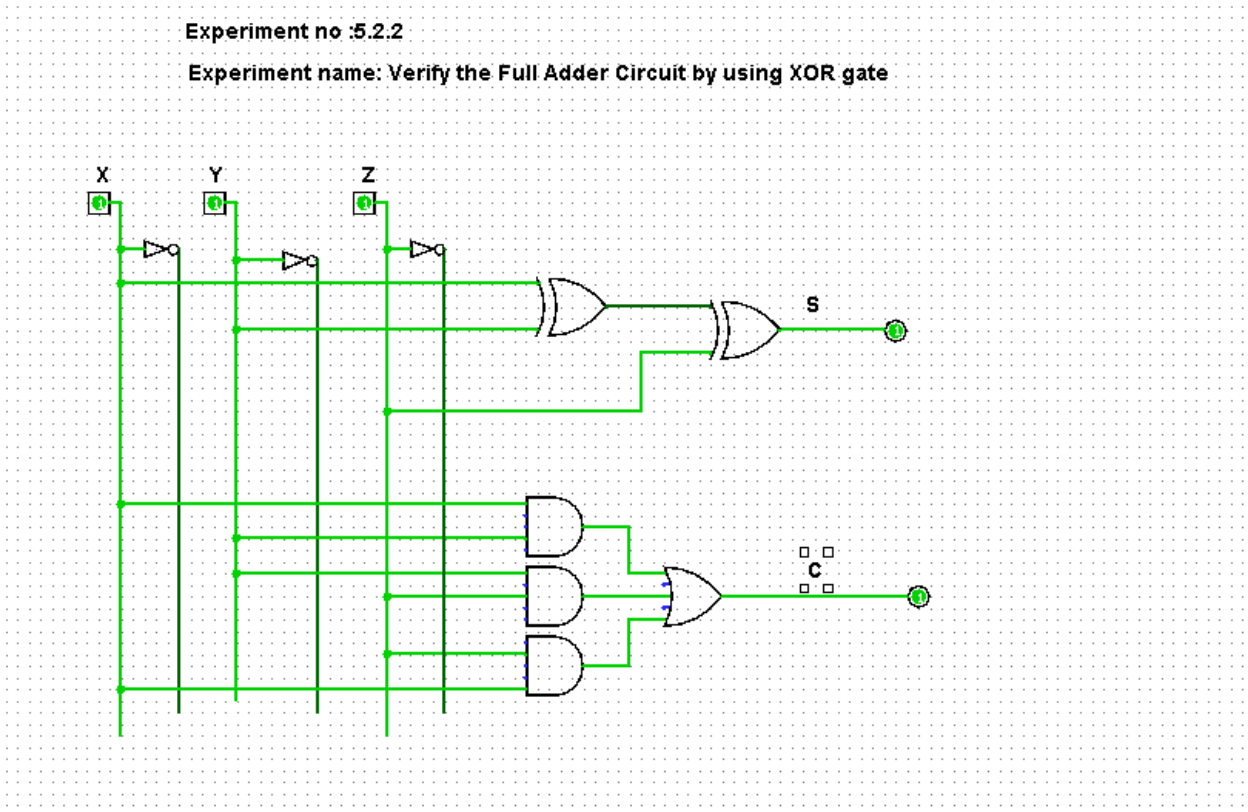
$C=X'YZ+XY'Z+XYZ'+XYZ$

$=X'YZ+XYZ+XY'Z+XYZ+XYZ'+XYZ$

$=(XY+YZ+ZX)$

Experimental result analysis:

1.Circuit Diagram:



2.Truth Table:

X	Y	Z	S(sum)	C(carry)
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

Conclusion:

This Full Adder gate is implemented through logisim software with XOR gate .

By analyzing circuit I get a truth table which is similar the original full adder circuit truth table .Thus the experiment finished successfully.

Experiment no:5.3

Experiment name: Implement the Full Adder circuit by using Half Adder Circuit and verify the result

Objectives :

- To learn about Full Adder Circuit
- Implement it by using half adder circuit
- Draw the truth table and verify the output result

Theory:

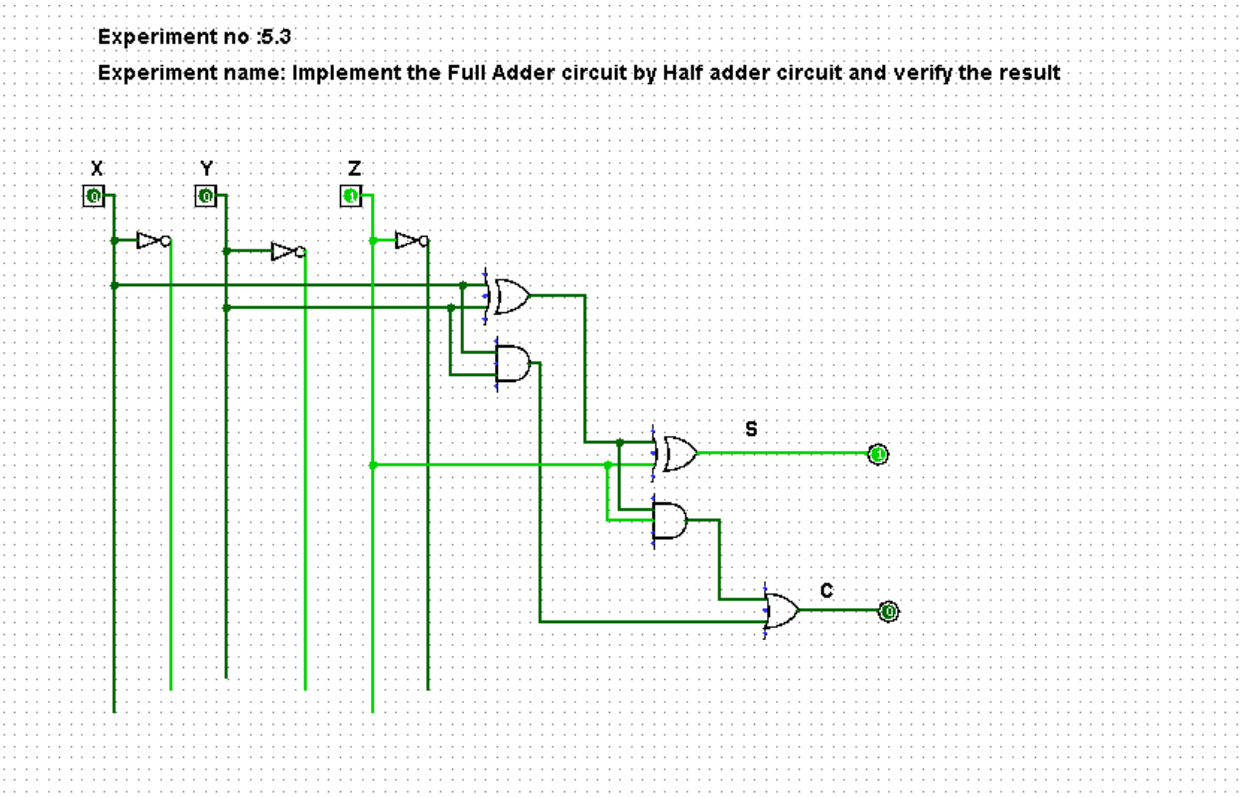
A Full adder is an electronic circuit that performs the addition three single binary digits and provide the output plus a carry value . It has three inputs called A ,B and C and two outputs S(sum),and C(carry).We can implement full adder circuit by using two half adder circuit and a OR gate .

Experimental result analysis:

1.Circuit Diagram:

Experiment no :5.3

Experiment name: Implement the Full Adder circuit by Half adder circuit and verify the result



2.Truth Table:

X	Y	Z	S(sum)	C(carry)
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

Conclusion:

This Full Adder gate is implemented through logisim software with two half adder circuit .

By analyzing circuit I get a truth table which is similar the original full adder circuit truth table .Thus the experiment finished successfully.