Rajshahi University of Engineering & Technology

Course No: CSE 2204

Course Title: Sessional based on CSE 2203

Submitted To:

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Experiment No.: 7.1

7.1.1: <u>Name of the experiment:</u>

7.1.2: <u>Objectives:</u>

- To understand how to use the logisim software, test logic design and debug it.
- To study & implement multiplexers with input & output.
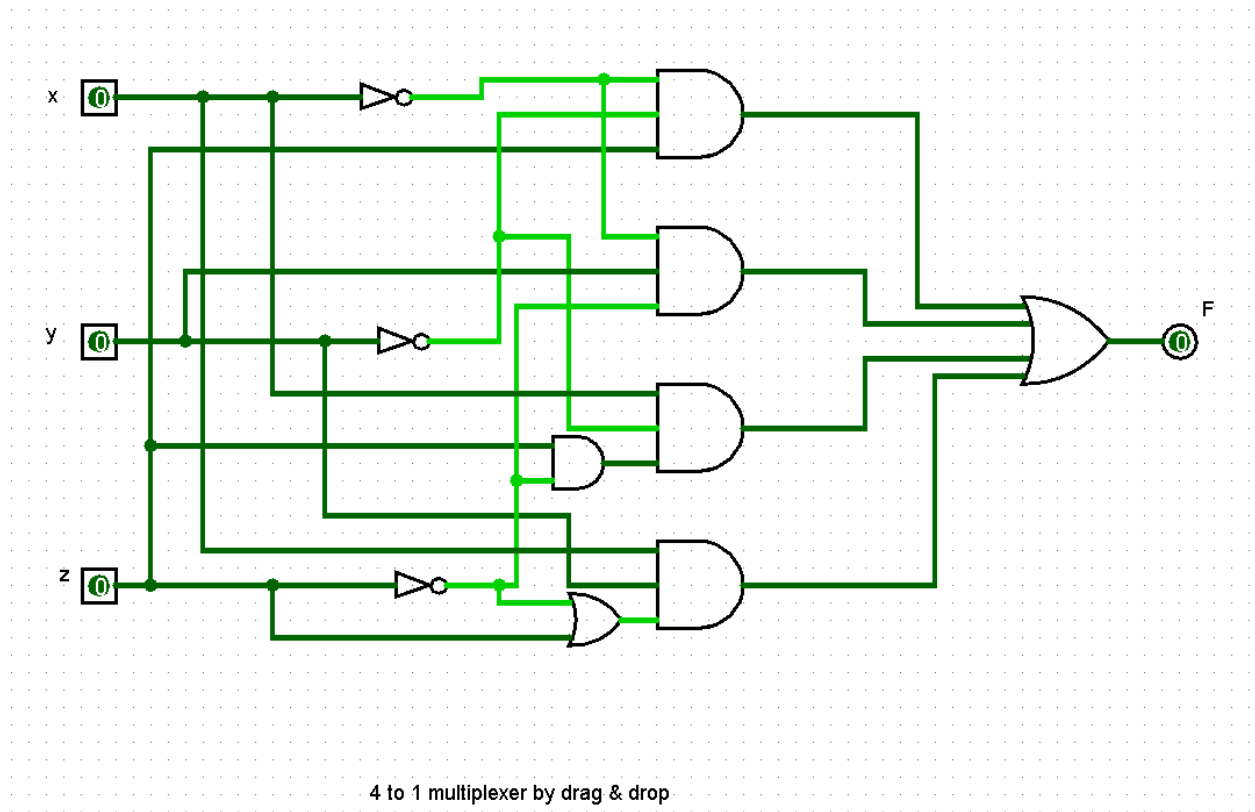- Understand how to implement simple circuits based on a schematic diagram using logic gates.

7.1.3: <u>Theory:</u>

7.1.4: <u>Experimental Analysis:</u>

(i) <u>Truth Table:</u>

A	B	C	X
0	0	0	0
0	0	1	1
0	1	0	1
0	1	1	0
1	0	0	0
1	0	1	0
1	1	0	1
1	1	1	1

(ii) <u>Circuit Diagram:</u>

4 to 1 multiplexer by drag & drop

7.1.5: Conclusion:

A Multiplexer is a device that allows one of several analog or digital input signals which are to be selected and transmits the input that is selected into a single medium. Multiplexer is also known as Data Selector. In this experiment, a 4x1 multiplexer was implemented in two ways. One was through drag & drop & the other was through analyzing circuit in logisim software.

Thus the experiment was done successfully.

Experiment No.: 6.2

6.2.1: Name of the experiment:

Verify various Encoders Input and Output.

6.2.2: Objectives:

- To understand how to use the logisim software, test logic design and debug it.
- To study & implement Encoders Input and Output with priority encoder.
- Understand how to implement simple circuits based on a schematic diagram using logic gates.

6.2.3: Theory:

An encoder is a combinational circuit that converts binary information in the form of a 2^N input lines into N output lines, which represent N bit code for the input. For simple encoders, it is assumed that only one input line is active at a time.

A priority encoder is a circuit or algorithm that compresses multiple binary inputs into a smaller number of outputs. The output of a priority encoder is the binary representation of the original number starting from zero of the most significant input bit. They are often used to control interrupt requests by acting on the highest priority interrupt input.

An ordinary encoder has a number of input lines but only one of them is activated at a given time. But a priority encoder can have more than one input activated at the same time.

Truth table of a 4 input priority encoder is given below:

Inputs				Outputs		
D_0	D_1	D_2	D_3	x	y	V
0	0	0	0	X	X	0
1	0	0	0	0	0	1
X	1	0	0	0	1	1
X	X	1	0	1	0	1
X	X	X	1	1	1	1

Where,

$x = D_2 + D_3$

$y = D_3 + D_1 D'_2$

$V = D_0 + D_1 + D_2 + D_3$

6.2.4: <u>Experimental Analysis:</u>

   (i)   <u>Truth Table:</u>

A	B	C	D	x	y	V
0	0	0	0	0	0	0
0	0	0	1	0	0	1
0	0	1	0	1	0	1
0	0	1	1	1	0	1
0	1	0	0	0	1	1
0	1	0	1	0	1	1
0	1	1	0	0	1	1

0	1	1	1	0	1	1
1	0	0	0	1	1	1
1	0	0	1	1	1	1
1	0	1	0	1	1	1
1	0	1	1	1	1	1
1	1	0	0	1	1	1
1	1	0	1	1	1	1
1	1	1	0	1	1	1
1	1	1	1	1	1	1

(ii)   Circuit Diagram:

4 input priority encoder
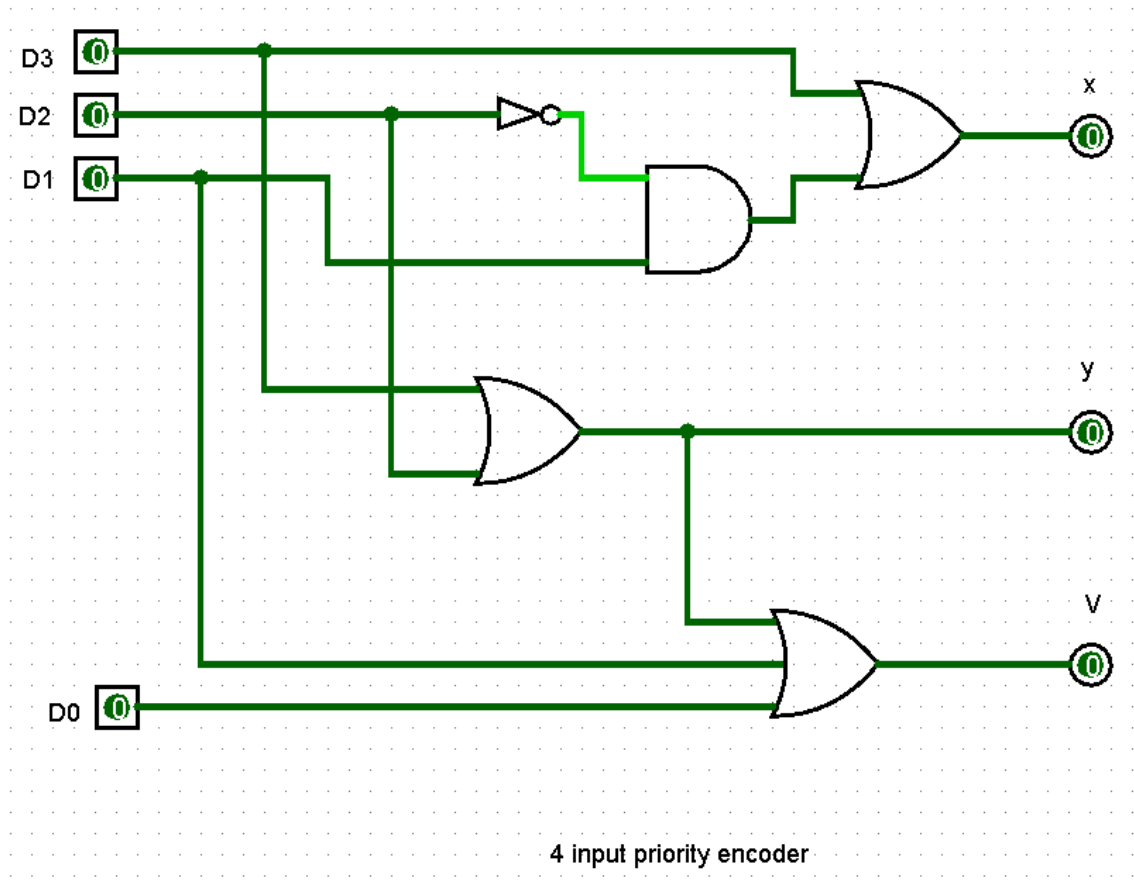
6.2.5: Conclusion:

A priority encoder overcomes this disadvantage of the binary encoder. It gives a coded output by assigning a priority to the bits of input. The lower priority bits' values don't matter. If the higher priority bit is high, then the priority encoder will generate the output depending on the high bit's position. In this experiment a 4 input priority encoder was implement in logisim software by drag & drop.

Thus the experiment was done successfully.