Computer Circuit Fundamentals (Lab 11)

MUXs and DeMUXs

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Experiment Performed on **29 November 2019**
Report Submitted on **29 November 2019**

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Computer Circuit Fundamentals
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OBJECTIVES

- To understand how multiplexers function.
- To understand how demultiplexers function.
- To understand how to test and verify multiplexers and demultiplexers.
- To identify multiplexer chips (4-to-1 MUX: 74153, 1-to-4 deMUX: 74139).

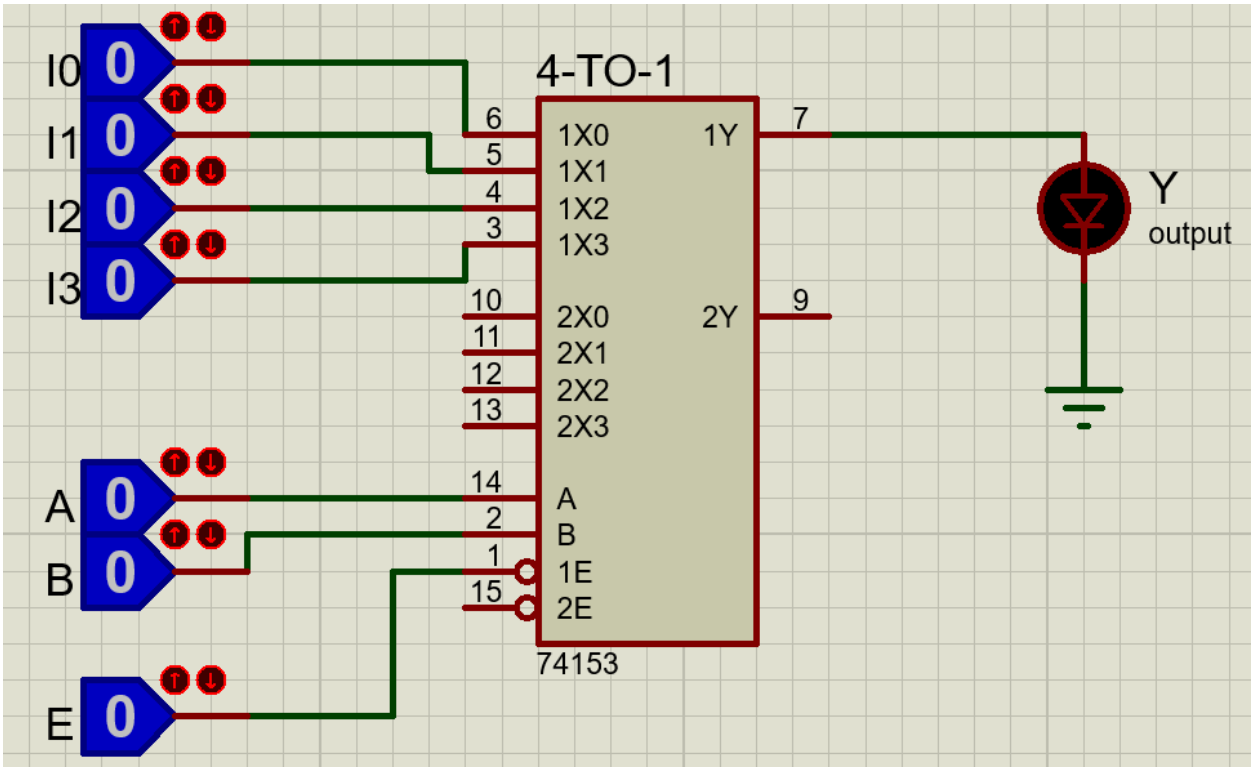
DESIGN

Experiment

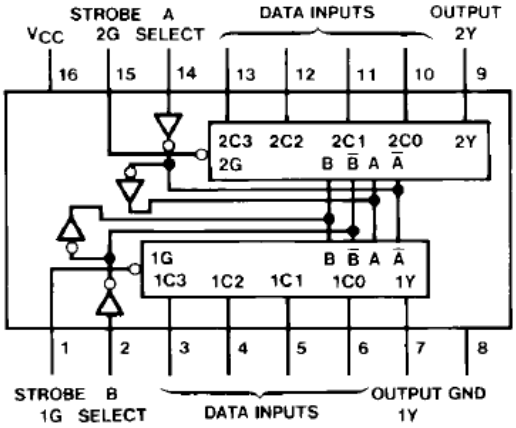
- First, we researched how multiplexers and demultiplexers function and how to identify them. Following that, there were two experiments conducted in this lab. The first one, to test a 4-to-1 MUX (74153) using the pencil box and to check results using a corresponding truth table. The second one, to test a 1-to-4 deMUX (74139) using the pencil box and to check results using a corresponding truth table. The tests were done during the lab period. Below shows the two circuits and their corresponding diagrams.

SCHEMATICS

4-to-1 MUX



Connection Diagram

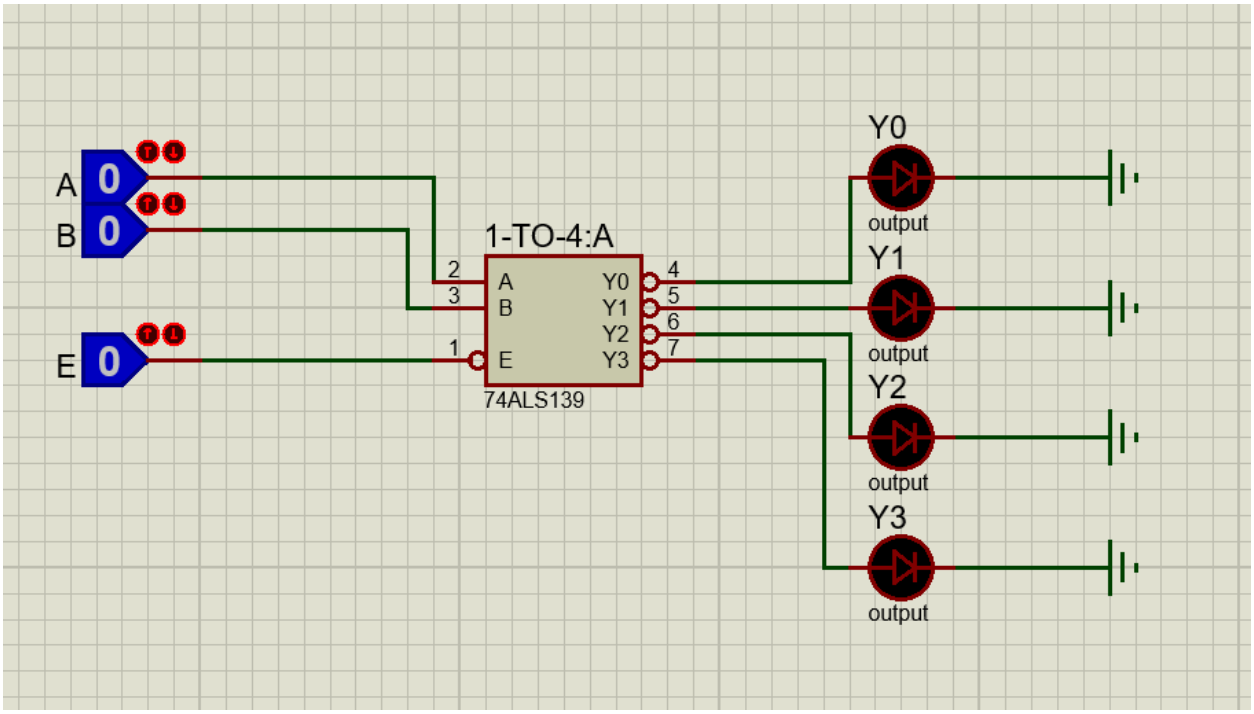


Function Table

Select Inputs		Data Inputs				Strobe	Output
B	A	C0	C1	C2	C3	G	Y
X	X	X	X	X	X	H	L
L	L	L	X	X	X	L	L
L	L	H	X	X	X	L	H
L	H	X	L	X	X	L	L
L	H	X	H	X	X	L	H
H	L	X	X	L	X	L	L
H	L	X	X	H	X	L	H
H	H	X	X	X	L	L	L
H	H	X	X	X	H	L	H

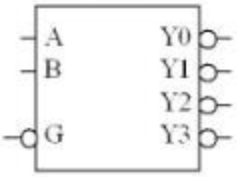
Select inputs A and B are common to both sections.
H = HIGH Level
L = LOW Level
X = Don't Care

1-to-4 deMUX



74139 2-Line-to-4-Line Decoder/Demultiplexer

74139



Enable	Select		Outputs			
G	B	A	Y0	Y1	Y2	Y3
L	L	L	L	H	H	H
L	L	H	H	L	H	H
L	H	L	H	H	L	H
L	H	H	H	H	H	L
H	×	×	H	H	H	H

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