North South University

Department of Electrical & Computer Engineering

LAB REPORT

Course Name: CSE332L

Experiment Number: 01

Experiment Name: Design of a 2-bit logic unit.

Experiment Date: 03/03/2021

Report Submission Date: 10/03/2021

Faculty: SFM

Submitted to: Md Saidur RRahman

Section: 06

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Remarks:	

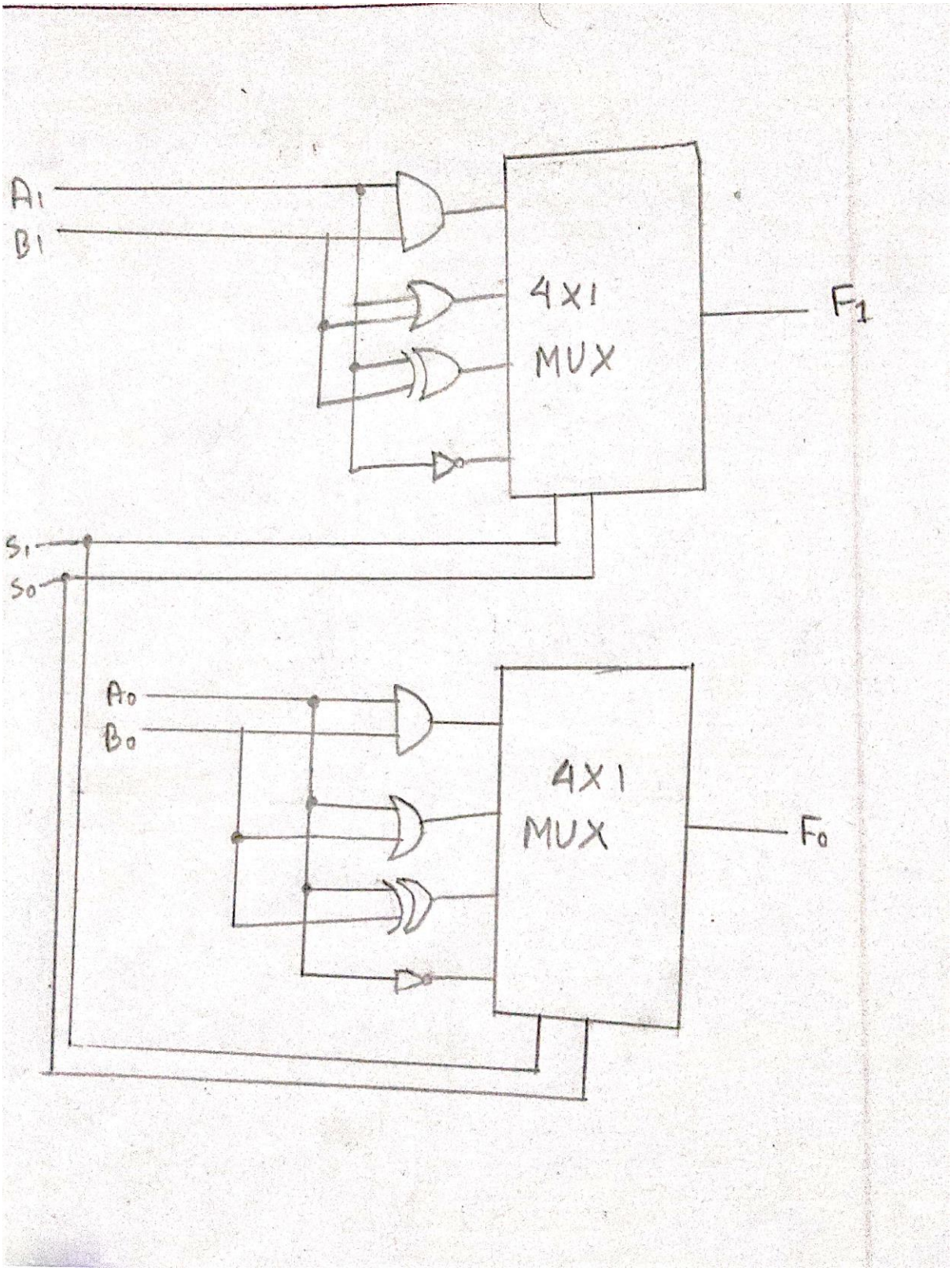
Objectives:

In this experiment, we are going to construct a 2-bit logic unit which is a part of an arithmetic logic unit (ALU). This logic unit will have 4 micro-operations which are AND, OR, XOR, and NOT operations. They can be used to change bit values, delete a group of bits or insert a new set of bits in a register. Logic micro-operations are very useful for manipulating individual bits or a portion of a word stored in a register. As we are going to design a 2-bit logic unit, we will have two outputs which are one output for each of the 2 bits.

Apparatus:

- Trainer board
- IC 7404,7408,7432,7486, 74F153 Wires for connection.

Circuit Diagram:



Logic Table:

A1	A0	B1	B0	AND1	AND0	OR1	OR0	XOR1	XOR0	NOT A1	NOT A0
0	0	0	0	0	0	0	0	0	0	1	1
0	0	0	1	0	0	0	1	0	1	1	1
0	0	1	0	0	0	1	0	1	0	1	1
0	0	1	1	0	0	1	1	1	1	1	1
0	1	0	0	0	0	0	1	0	1	1	0
0	1	0	1	0	1	0	1	0	0	1	0
0	1	1	0	0	0	1	1	1	1	1	0
0	1	1	1	0	1	1	1	1	0	1	0
1	0	0	0	0	0	1	0	1	0	0	1
1	0	0	1	0	0	1	1	1	1	0	1
1	0	1	0	1	0	1	0	0	0	0	1
1	0	1	1	1	0	1	1	0	1	0	1
1	1	0	0	0	0	1	1	1	1	0	0
1	1	0	1	0	1	1	1	1	0	0	0
1	1	1	0	1	0	1	1	0	1	0	0
1	1	1	1	1	1	1	1	0	0	0	0

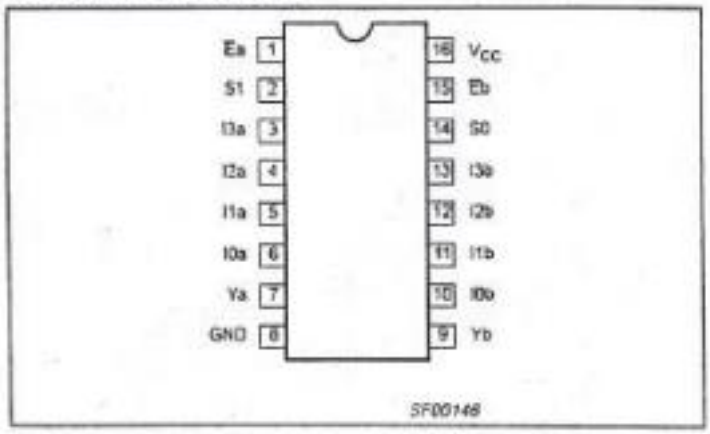
Instruction:

1) Place the ICs on the trainer board.
2) Connect Vcc and ground to the respective pins of IC.
3) Connect the inputs with the switches and the outputs with LEDs.
4) Apply various combinations of inputs and observe the outputs.
5) Verify the experimental outputs with the Truth Table.

Pin configuration of ICs:

EEE336/CSE232 LAB
Dual 4x1 Multiplexer 74F153
Data Sheet

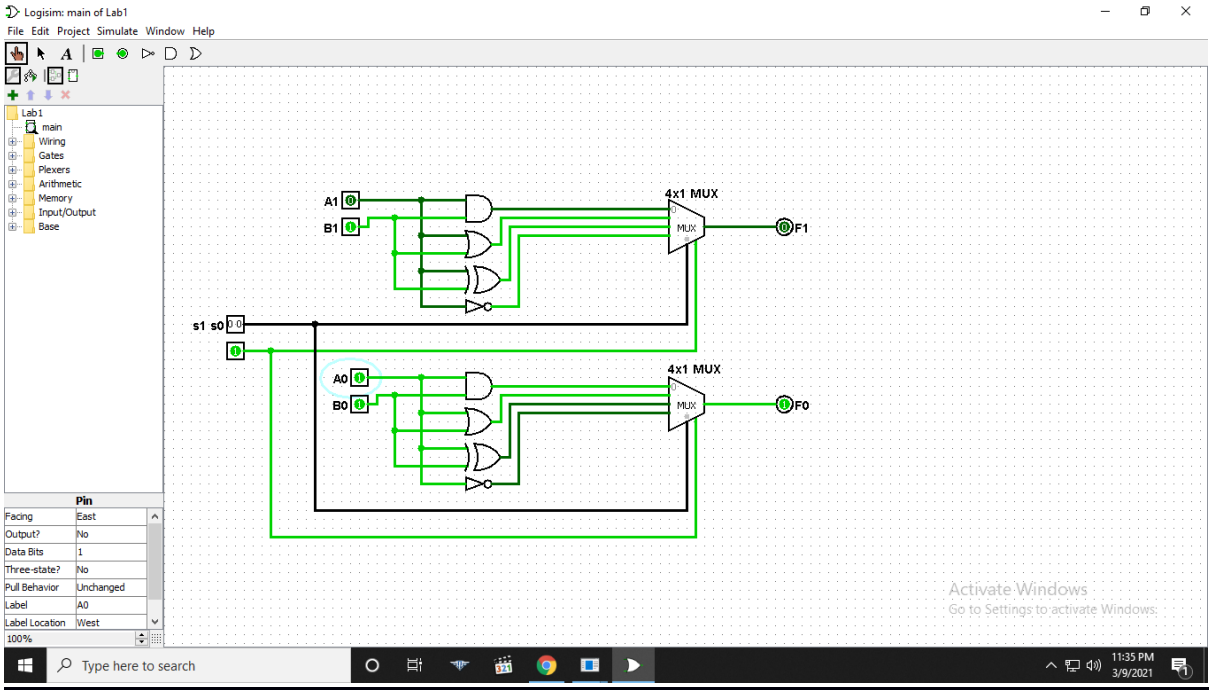
PIN CONFIGURATION



INPUT AND OUTPUT LOADING AND FAN-OUT TABLE

PINS	DESCRIPTION
I0a – I3a	Port A data inputs
I0b – I3b	Port B data inputs
S0, S1	Common Select inputs
Ea	Port A Enable input (active Low)
Eb	Port B Enable input (active Low)
Ya, Yb	Port A, B data outputs

Logisim works screenshot(s) :



Discussion:

In lab 1 and in the lab class I face some problem doing the 4x1 MUX. I had done mistake, in min terms but I solve that by following the equation. There are 4 input, two select line, an enable key. Every component in the circuit is 2 bit. But this lab was pretty simple. It took some time but finally I found out where the problem was and fix IC circuit and then solved it properly. By the help of our class lab instructor I fix that problem also. That was all human e error problem. After understanding all the problem and practicing that problem, I answered all the questions.