North South University

Department of Electrical & Computer Engineering

Lab Report

Experiment No:	1
Experiment Title:	Design of a 2-bit Logic Unit
Course Code:	**CSE332L**
Course Name:	**Computer Organization & Architecture Lab**
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Date of Experiment:	19/10/2021
Date of Submission:	19/10/2021

Objectives:

* In this experiment our objective is to build a 2-bit logic unit.

Equipment List:

* Trainer Board
* 7404 NOT IC
* 7408 AND IC
* 7432 OR IC
* 7486 XOR IC
* 74F153 MUX IC
* Wires for connection.

Block Diagram:

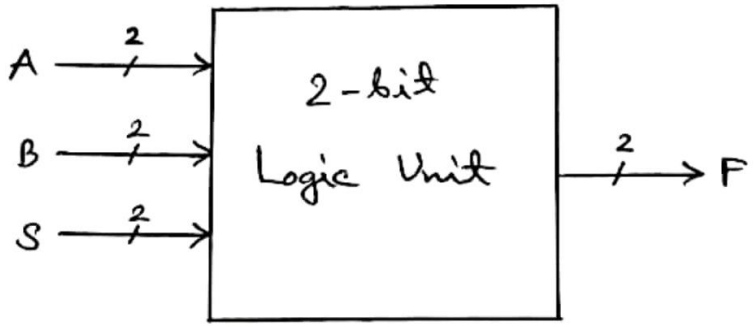

Figure 1: Block Diagram of a 2-bit LU

Truth 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

Table: Truth Table for a 2-bit Logic Unit

Circuit Diagram:

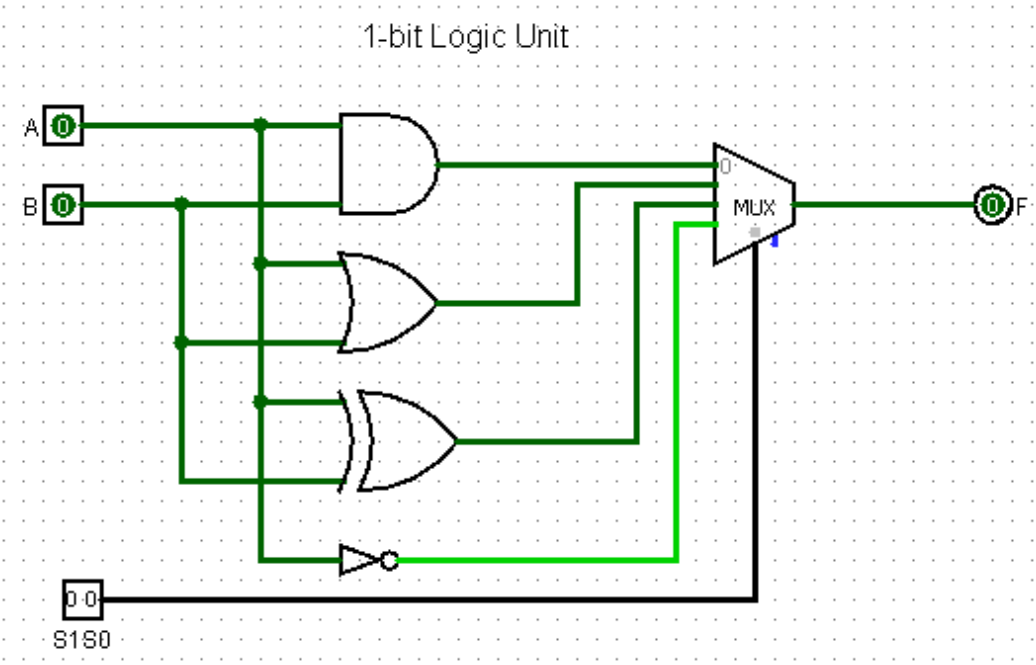

Figure 2: 1-bit Logic Unit

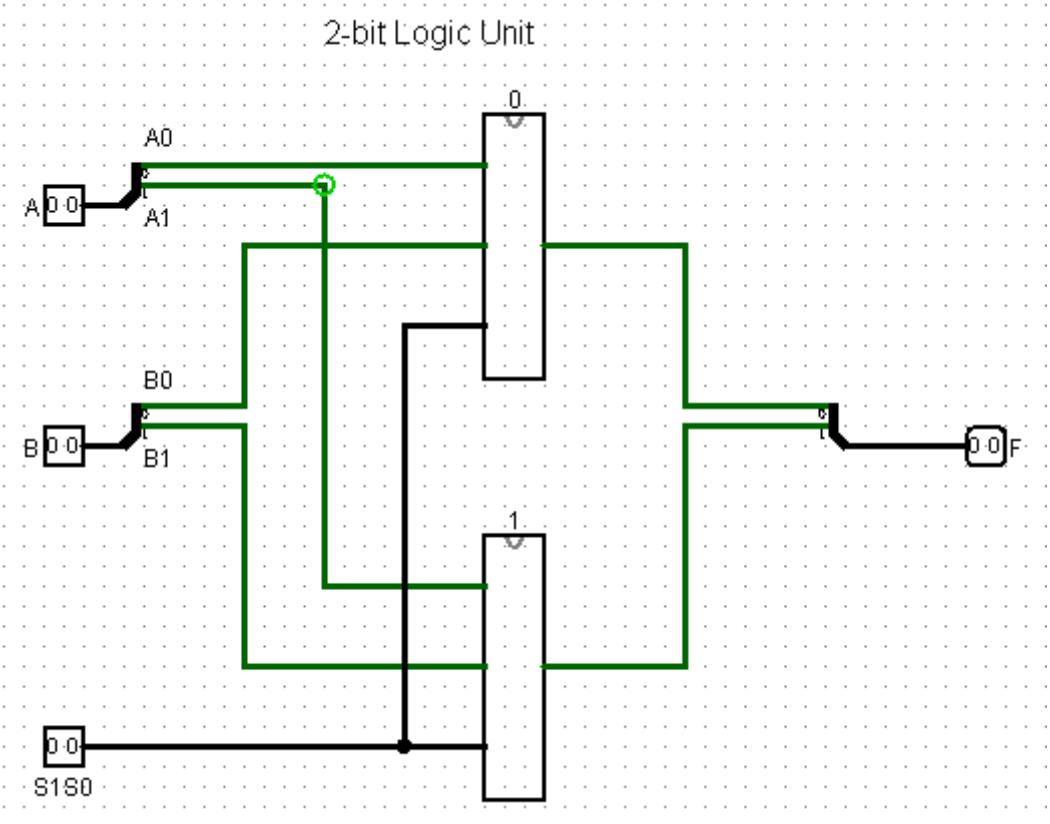

Figure 3: 2-bit Logic Unit

Discussion!

In this experiment we learnt how to build a 2-bit logic unit.

So, to design the LU we first drew the block diagram then we completed the truth table. Then in the logisim we took the 4 gates that we needed for the LU, then took our inputs A, B and connected them to the 4 gates. Then we took a 4:1 MUX where we connected the output of the 4 gates as inputs and we took our 3rd input of LU as select bits of the MUX which was of 2-bit data then we took an output pin and connected it to the output line of the MUX and then we got our circuit for an 1-bit logic unit. Then we took a new circuit under the same project for the 2-bit LU. Then we used the 1-bit LU as a sub-circuit and built the 2-bit LU where we used splitter to split our input A, B and the output F. Thus we got our circuit for the 2-bit logic unit.