North South University

Department of Electrical & Computer Engineering

Lab Report

Experiment No: 1

Experiment Title: 2-bit Logic Unit

Course Code: **CSE332L**

Section: **10**

Course Name: **Computer Organization & Architecture Lab**

Lab Group #: 3

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Experiment name: Design of a 2-bit ~~Binary Up-Down counter~~ logic Unit

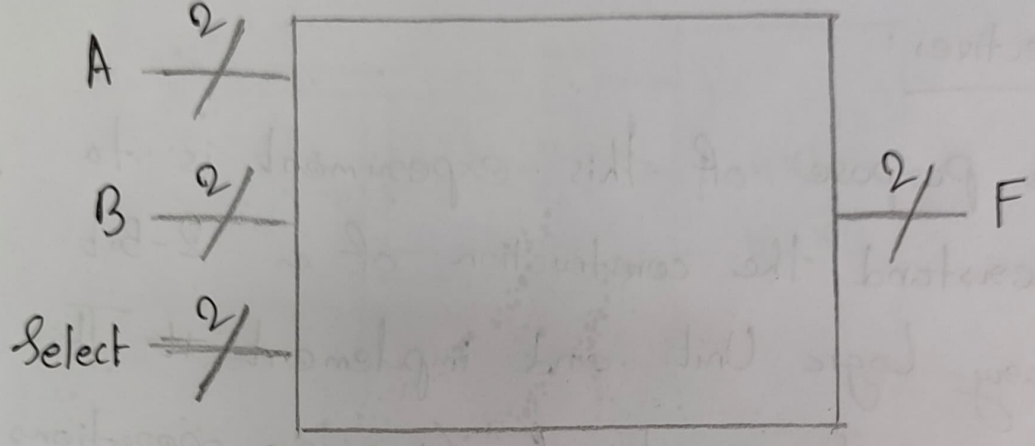
Objectives:

The purpose of this experiment is to understand the construction of a 2-Bit Binary Logic Unit and implement it. This logic unit consists of 4 micro operations: AND, OR, NOT and XOR. In our 2-bit logic unit, we will have two outputs for 2-bits. We'll ~~kat have two~~ verify the 2-bit logic unit using the truth table.

Equipments list:

- Trainer Board
- IC 7404 (NOT)
- IC 7408 (AND)
- IC 7432 (OR)
- IC 7486 (XOR)
- IC 74F153 (Multiplexer)
- Wires

Block Diagram



Truth Table

A1	A0	B1	B0	AND1	AND0	OR1	OR0	XOR1	XOR0	NOTA1	NOTA0
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

Circuit Diagram

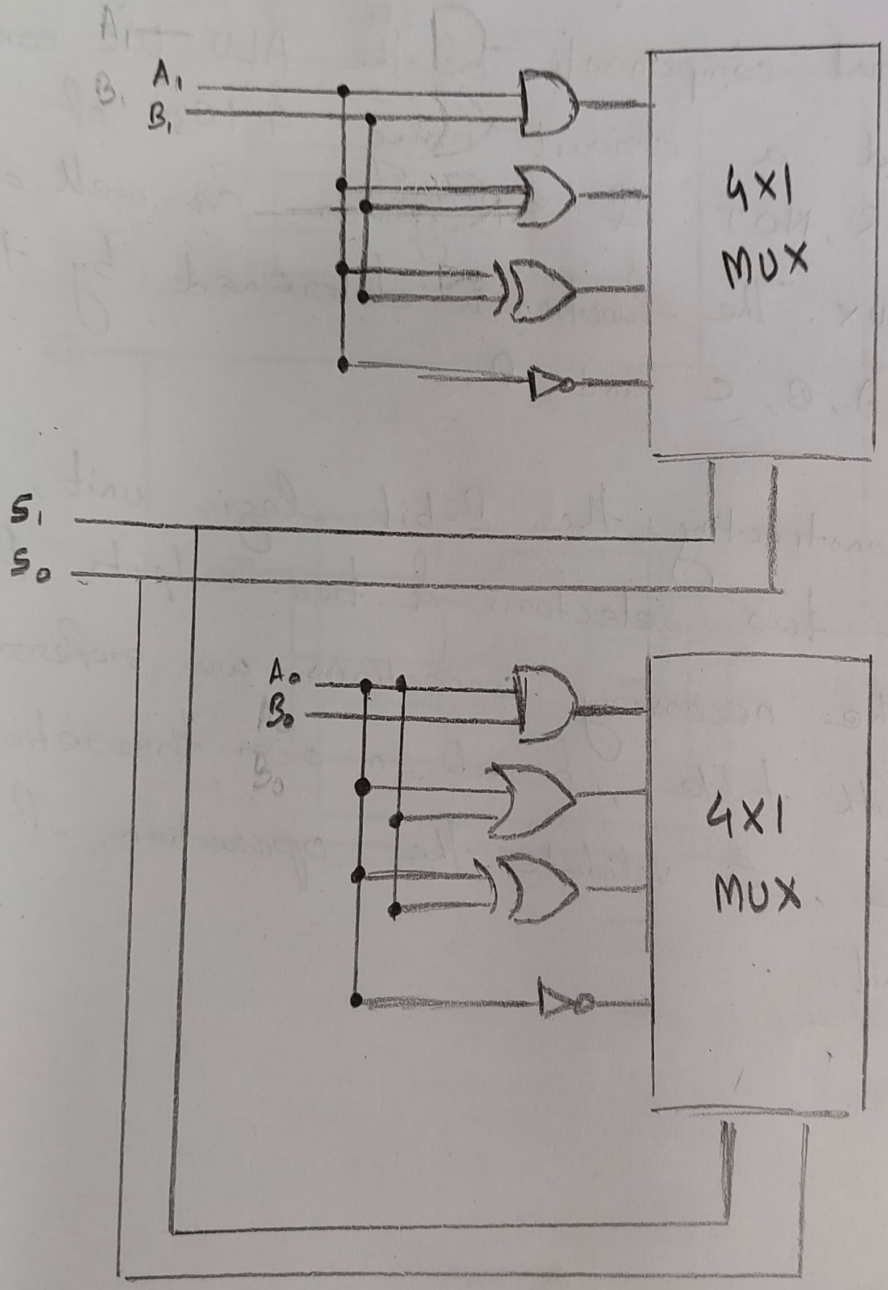


Fig: 2-bit Logic Unit

Discussion:

In our experiment, our main objective was to design and implement a 2-bit logic unit, an integral component of the ALU. We ~~created~~ constructed a circuit using 4 ICs of AND, OR, NOT & XOR gates as well as 4:1 MUX. The function is determined by the inputs A, B, C and D.

When constructing the 2-bit logic unit, we also had two selectors & two outputs. After making the necessary connections, we referred to a truth table, based on our theoretical knowledge, to validate the operation of our logic unit.

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