

North South University

ECE

Lab Report-1

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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Objective:

The objective is to make a ALU capable of doing basic Arithmetic operation

like:

- (1) And
- (2) OR
- (3) XOR

④ NOT

When those operation are selected by selection bit the selective operation should be performed

Equipment list:

Trainer Board

IC 7404, 7408, 7486, 74F153

Wires for connection

Block Diagram:

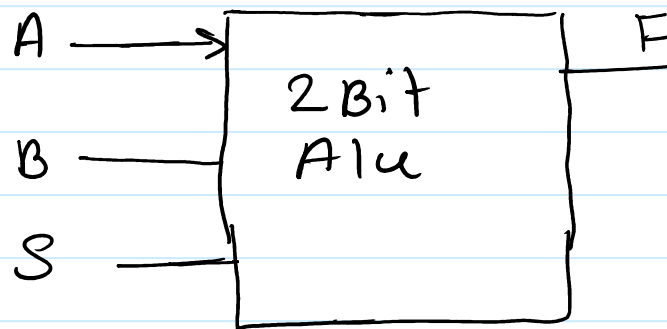
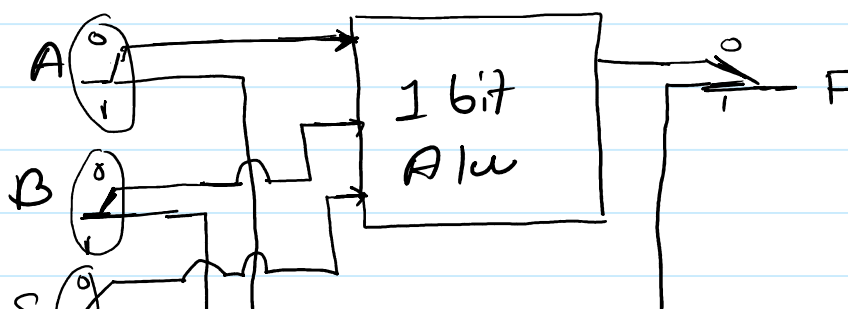


Fig-1: 2bit ALU



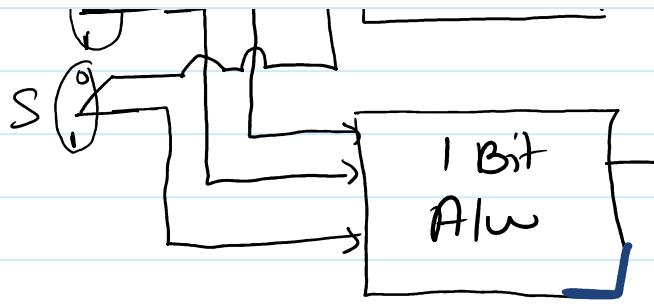


Fig-2: 2bit ALU Breakdown

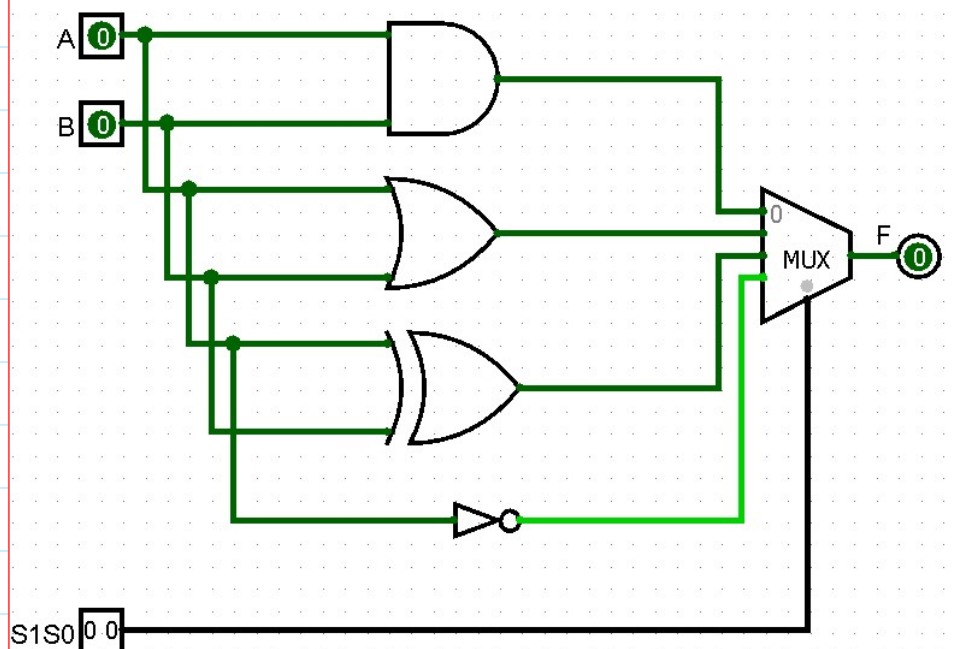
Truth table:

A ₁	A ₀	B ₁	B ₀	And ₁	And ₀	OR ₁	OR ₀	XOR ₁	XOR ₀	NOT A ₁	NOT A ₀
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	0	1	1	0	1	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-1: 2bit ALU Truth Table

Circuit Diagram:



$S(00)_2$	And
$S(01)_2$	OR
$S(10)_2$	XOR
$S(11)_2$	NOT

Fig-3: Circuit- Inside 1bit ALU

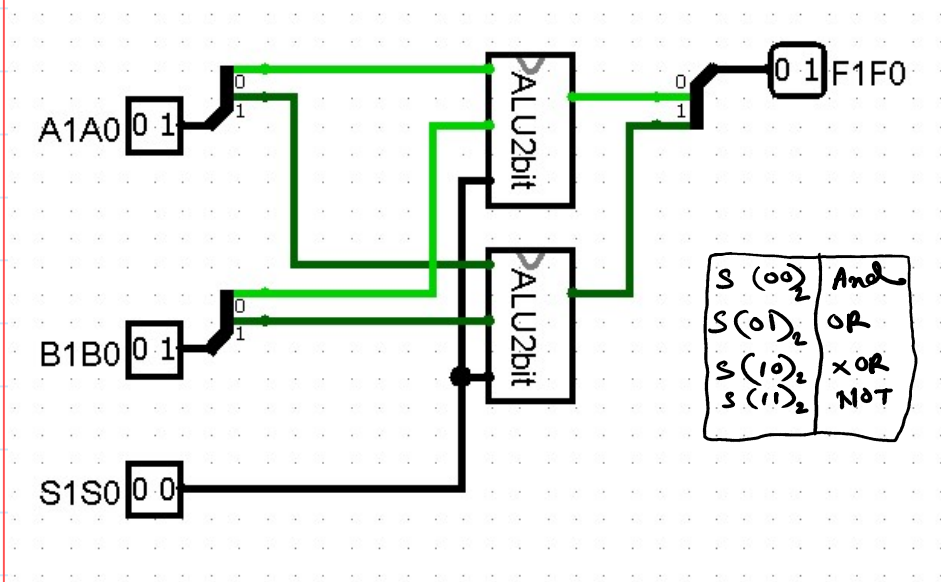


Fig-3: Circuit- 2bit ALU

Discussion:

Here using circuit we made it so that we can perform basic Arithmetic operation.

We created the circuit in logisim using 1-bit ALU. Combining them to be used as 2-bit ALU with the help of mux.

Here Selection bit determine which operation are being performed

$S(00)_2 \rightarrow \text{And}$

$S(01)_2 \rightarrow \text{OR}$

$S(10)_2 \rightarrow \text{XOR}$

$S(11)_2 \rightarrow \text{NOT}$

Hopefully we didn't face any problem
erating it