

NORTH SOUTH UNIVERSITY
Department of Electrical and Computer Engineering
CSE 332 / EEE 336

Experiment No: 1

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

Introduction:

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

Equipments:

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

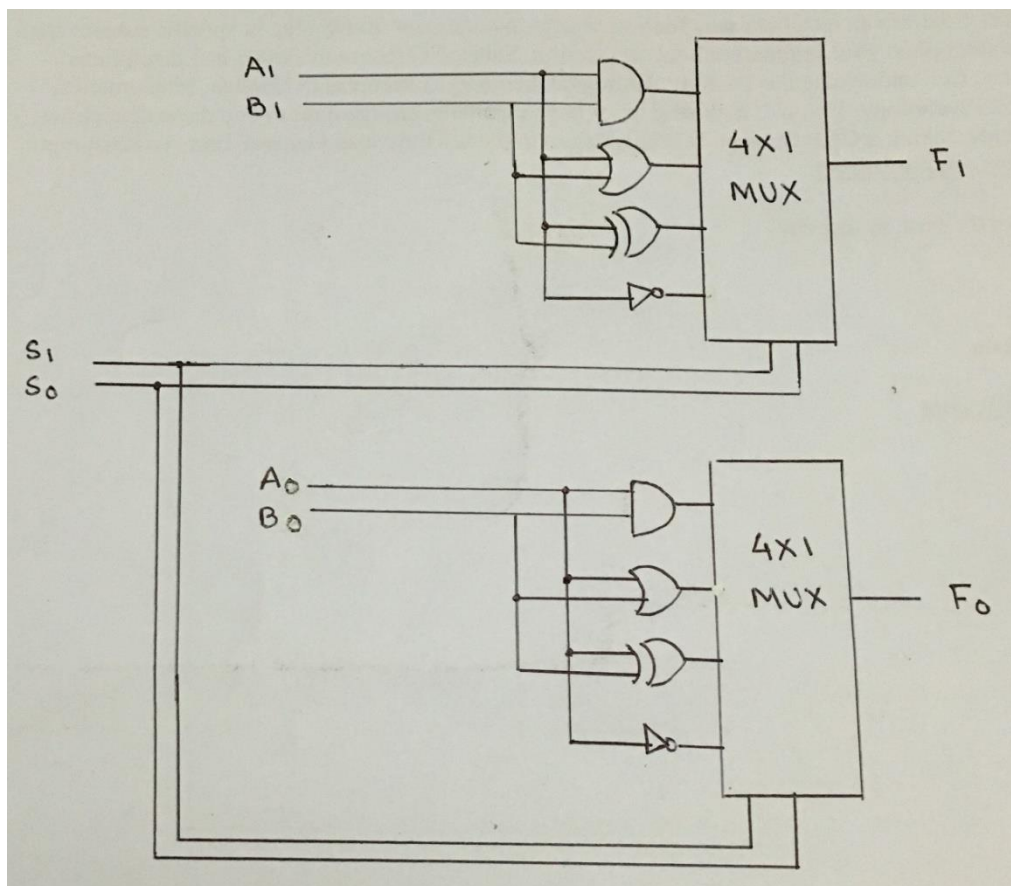
Truth Table:

Complete the Truth Table according to your theoretical knowledge.

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

1	0	1	1								
1	1	0	0								
1	1	0	1								
1	1	1	0								
1	1	1	1								

Logic Diagram:



Procedure:

- 1) Place the ICs on the trainer board.
- 2) Connect V_{cc} 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.

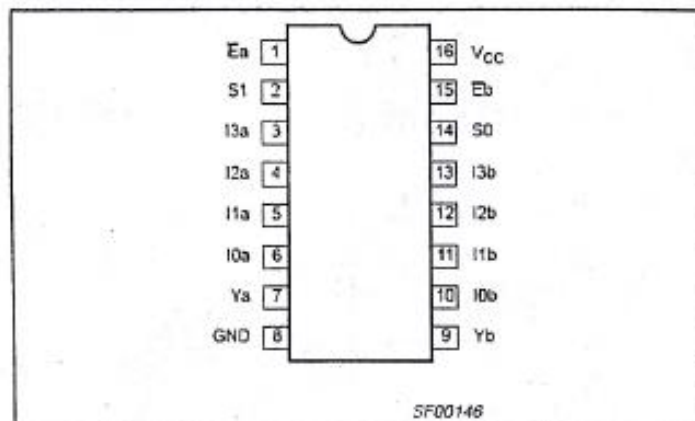
Assignment:

- 1) Prepare the lab report.
- 2) Implement the circuit in Logisim. Take a screenshot and include it in your lab report.

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

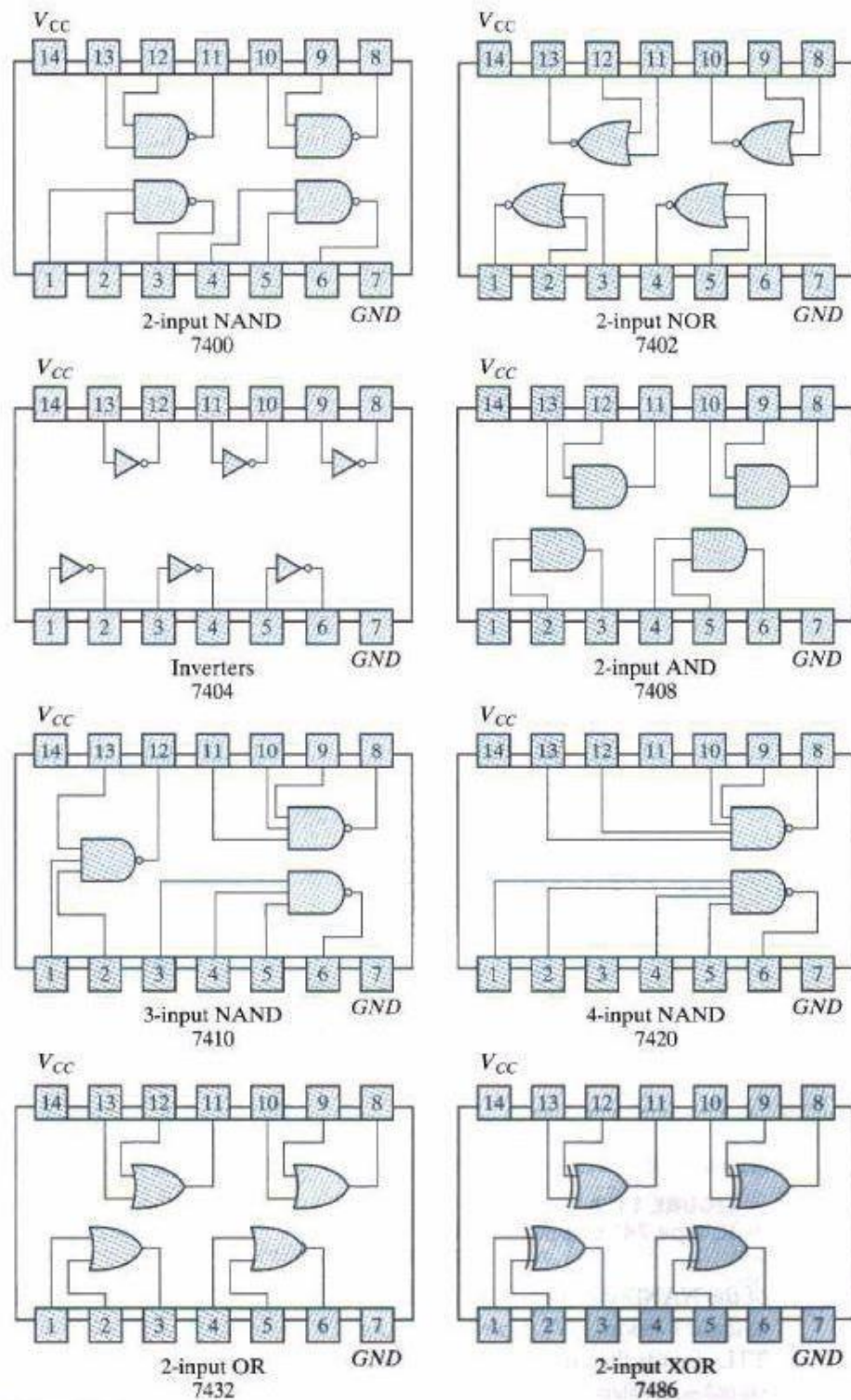


FIGURE 11.1
Digital gates in IC packages with identification numbers and pin assignments