IIID

INDRAPRASTHA INSTITUTE *of* INFORMATION TECHNOLOGY DELHI

Department
of
Electronics & Communication Engineering

ECE111|Digital Circuits
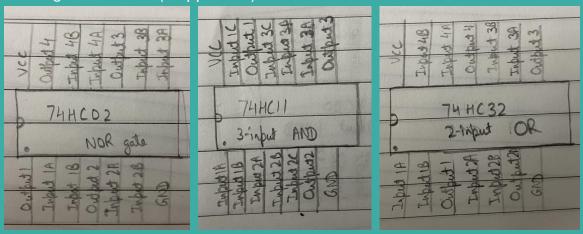Section: B

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Lab_3:

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Aim: In this experiment, we will design 2x1, 4x1 and 8x1 Multiplexers having Enable pin, using basic logic gates in TinkerCad and test its performance for various conditions.
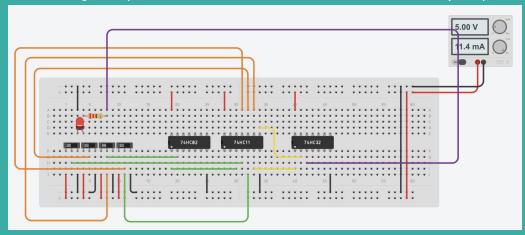
Part A

Components/ICs Used: Breadboard, wires, LEDs, resistors, slide switches, power supply, NOR, 3-input AND, OR gates.

Link of TINKERCAD Workspace: https://www.tinkercad.com/things/7RFiNyEvNvW

Pin Diagram of the IC (If Applicable):

Circuit Diagram: (Screenshot of Circuitverse/TinkerCAD workspace)

Truth Table:

E	S	F
0	0	0
0	1	0
1	0	I0
1	1	I1

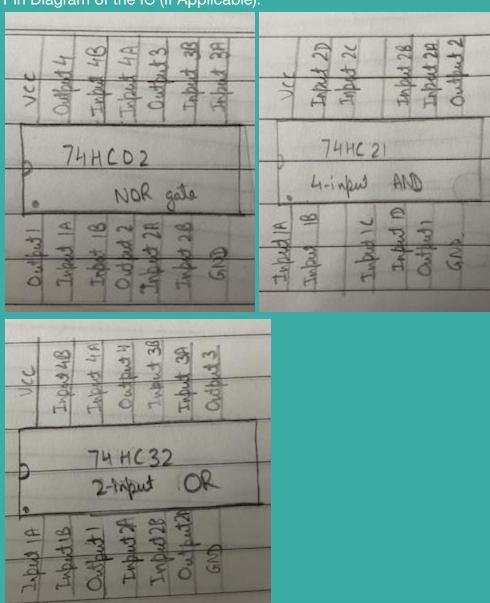Observations/Results: Created a 2x1 MUX switch

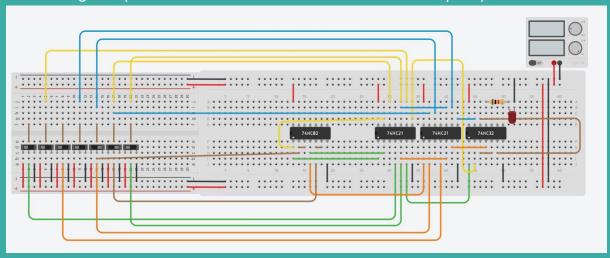Application: It is used to create a switch to see which input is taken

Part B

Components/ICs Used: Breadboard, wires, LEDs, resistors, slide switches, power supply, NOR, 4-input AND, OR gate.

Link of TINKERCAD Workspace: https://www.tinkercad.com/things/h6Lk95tCNQT

Pin Diagram of the IC (If Applicable):

Circuit Diagram: (Screenshot of Circuitverse/TinkerCAD workspace)

Truth Table:

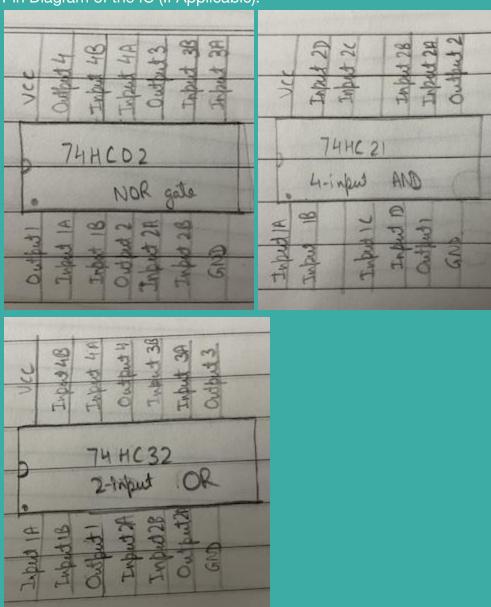| E	S1	S2	F
0	0	0	0
0	0	1	0
0	1	0	0
0	1	1	0
1	0	0	I0
1	0	1	I1
1	1	0	I2
1	1	1	I3

Observations/Results: Created a 4x1 MUX switch

Application: It is used to create a switch to see which input is taken
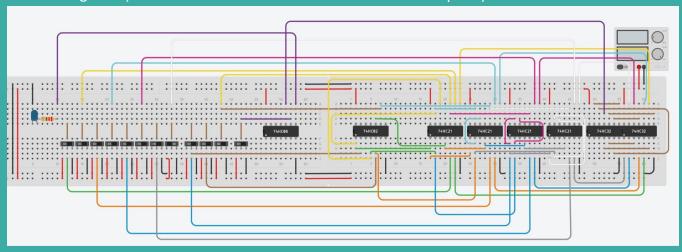
Part C

Components/ICs Used: Breadboard, wires, LEDs, resistors, slide switches, power supply, NOR, OR, AND, 4-input AND gates.

Link of TINKERCAD Workspace: https://www.tinkercad.com/things/IOAo9L3vl82

Pin Diagram of the IC (If Applicable):

Circuit Diagram: (Screenshot of Circuitverse/TinkerCAD workspace)

Truth Table:

E	S1	S2	S3	F
0	0	0	0	0
0	0	0	1	0
0	0	1	0	0
0	0	1	1	0
0	1	0	0	0
0	1	0	1	0
0	1	1	0	0
0	1	1	1	0
1	0	0	0	I0
1	0	0	1	I1
1	0	1	0	I2
1	0	1	1	I3
1	1	0	0	I4
1	1	0	1	I5
1	1	1	0	I6
1	1	1	1	I7

Observations/Results: Create an 8x1 MUX switch

Application: It is used to create a switch to see which input is taken

Problem Statement

Statement solution:

Since the bottom gate needs to be open when the gate level is turned on, the lock is drained, and value control is 0 when the lock is drained
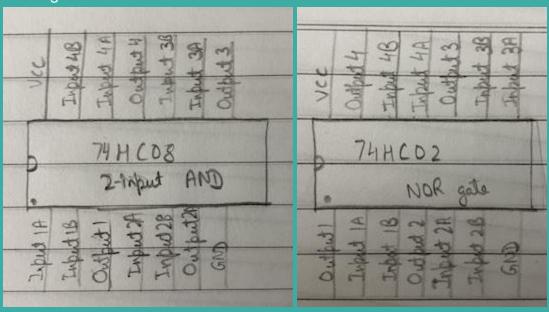
=> X (bottom) = Valve' AND gate lever

Similarly, for top gate lock must be filled, and value control is 1 when the lock is filled

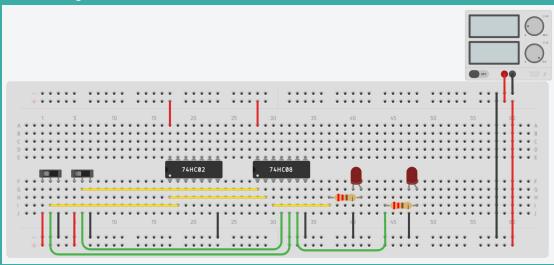=> Y (top) = Valve AND gate lever

Components/ICs Used: Breadboard, wires, LEDs, resistors, slide switches, power supply, AND, NOR gates.

Link of TINKERCAD Workspace:https://www.tinkercad.com/things/7o8cbQxoQzx

Pin diagram of the IC:

Circuit Diagram:

Truth Table:

Valve	Gate Lever	X (bottom)	Y (top)
0	0	0	0
0	1	1	0
1	0	0	0
1	1	0	1