INDRAPRASTHA INSTITUTE *of*
INFORMATION TECHNOLOGY
DELHI

Department
of
Electronics & Communication Engineering

ECE111|Digital Circuits

Dr. G.S. Visweswaran

Lab_1:

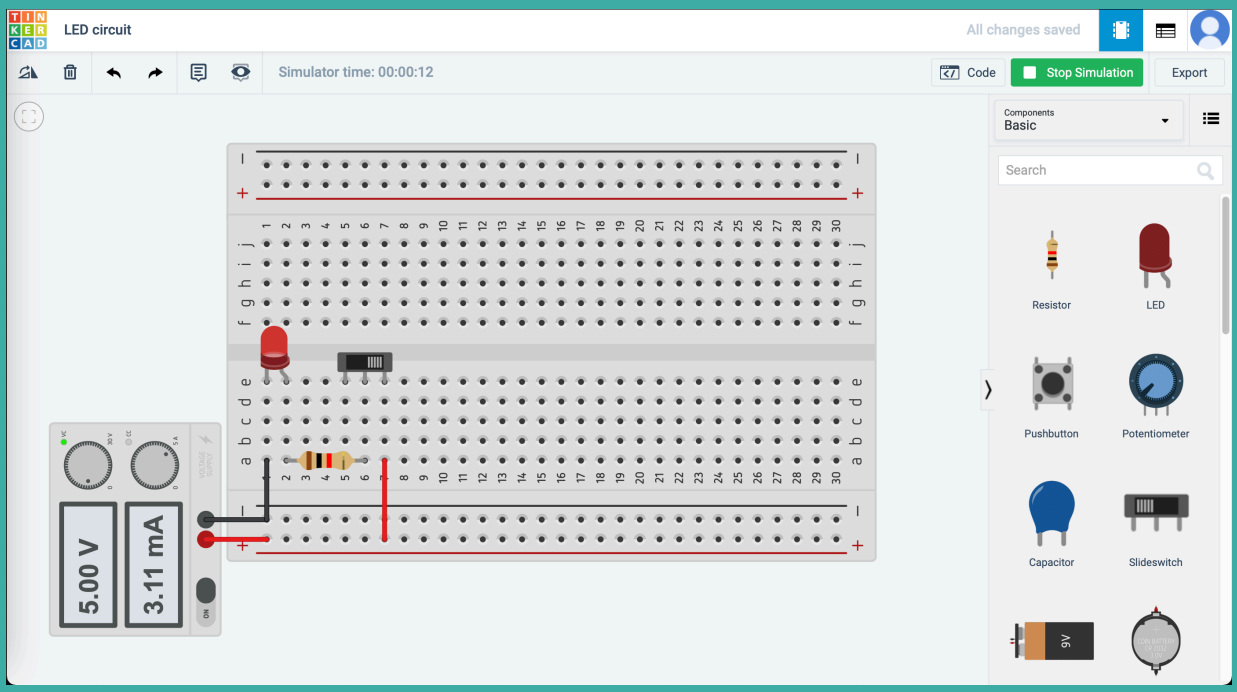
Student Name : Aayush Gakhar
Roll No. : 2020006
Date : 21/1/2021

Aim: Creating a simple circuit using breadboard

Components/ICs Used: Breadboard, Red LED, 1 kΩ Resistor, [5,5 Power Supply], Wire, slideswitch
Link of TINKERCAD Workspace: https://www.tinkercad.com/things/1eF7JFtlWN8

Pin Diagram of the IC (If Applicable)

Circuit Diagram: Screen shot



Truth Table:

Switch	LED
0	0
1	1

K maps (If Applicable):

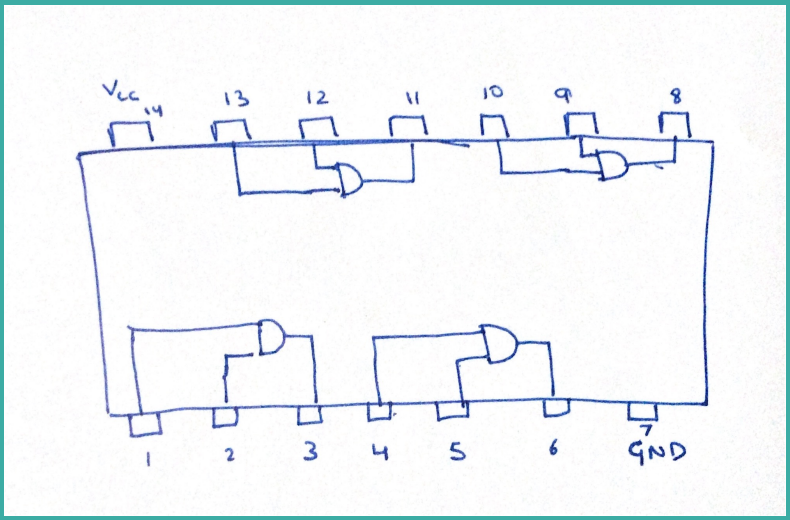
Observations/Results: We can conclude that the LED glows when switch is on and vice versa.

Aim: Testing output of AND gate using Tinkercad

Components/ICs Used: Breadboard, Red LED, 1 kΩ Resistor, [5,5 Power Supply], Wire, slideswitch, Quad AND gate(74HC08)

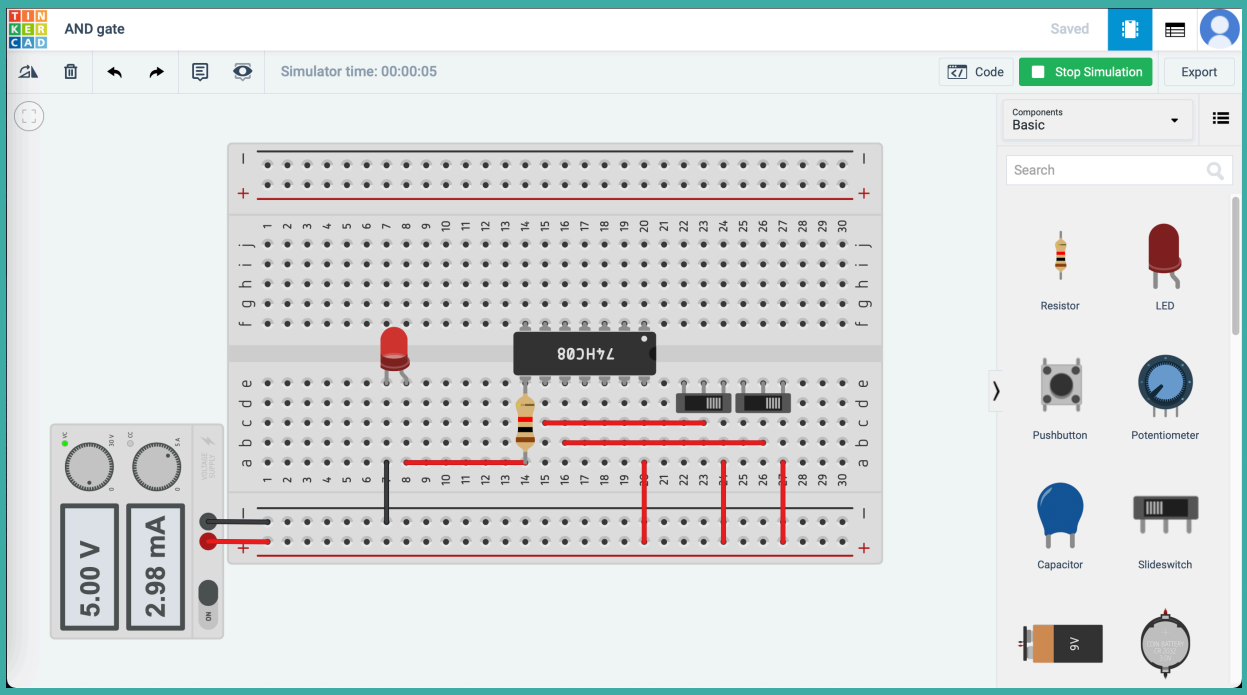
Link of TINKERCAD Workspace: https://www.tinkercad.com/things/1oYHVhukjBu

Pin Diagram of the IC (If Applicable):



74HC08

Circuit Diagram: Screen shot



Truth Table:

X	*Y*	*X AND Y*
0	0	0
0	1	0
1	0	0
1	1	1

K maps (If Applicable):

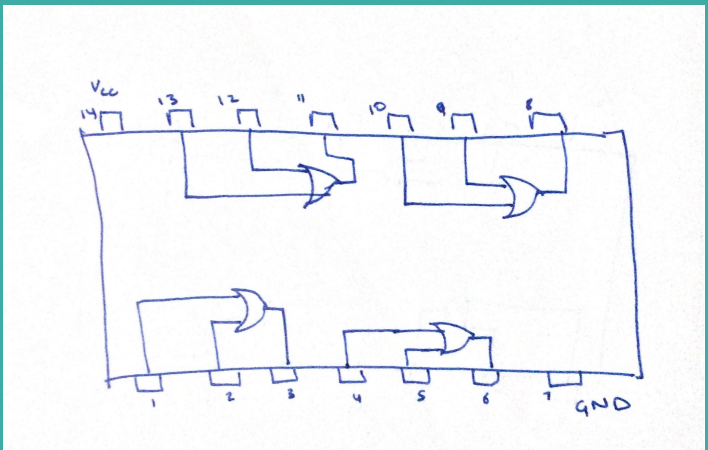
Observations/Results: We can conclude that output of and gate in Tinkercad verifies the truth table.

Aim: Testing output of OR gate using Tinkercad

Components/ICs Used: Breadboard, Red LED, 1 kΩ Resistor, [5,5 Power Supply], Wire, slideswitch, Quad OR gate(74HC32)

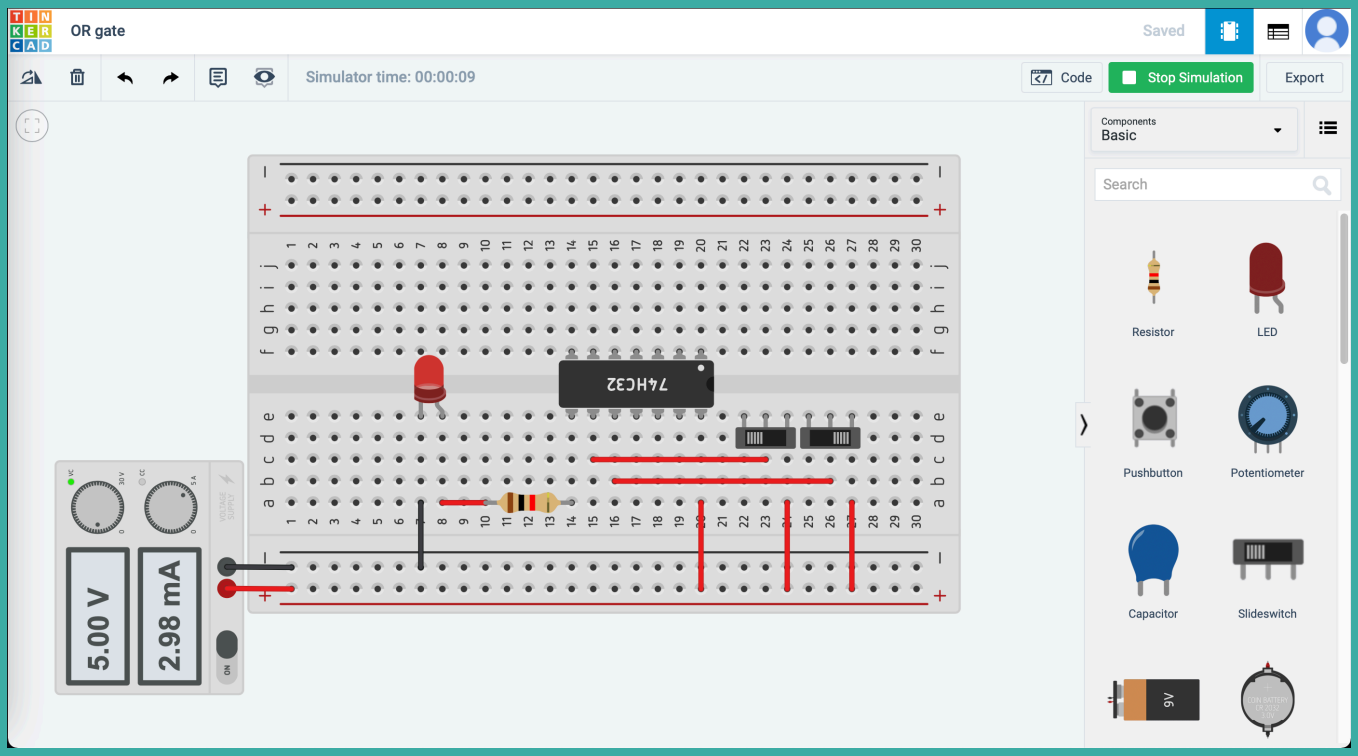
Link of TINKERCAD Workspace: https://www.tinkercad.com/things/beGVDjqiXd4

Pin Diagram of the IC (If Applicable):



74HC32

Circuit Diagram: Screen shot



Truth Table:

X	*Y*	*X OR Y*
0	0	0
0	1	1
1	0	1
1	1	1

K maps (If Applicable):

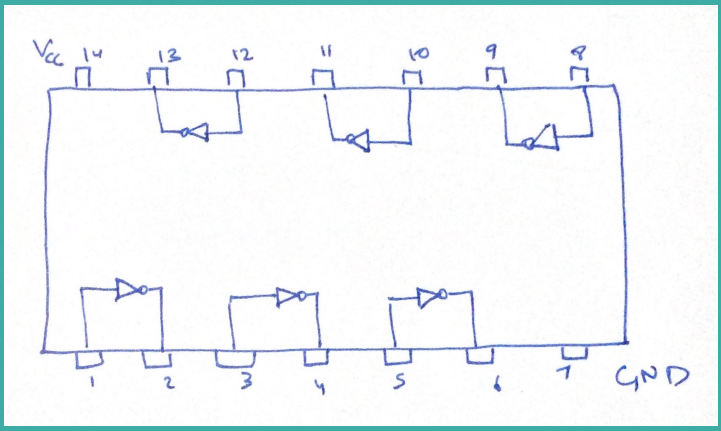
Observations/Results: We can conclude that output of or gate in Tinkercad verifies the truth table.

Aim: Testing output of NOT gate using Tinkercad

Components/ICs Used: Breadboard, Red LED, 1 kΩ Resistor, [5,5 Power Supply], Wire, slideswitch, Hex inverter(74HC04)

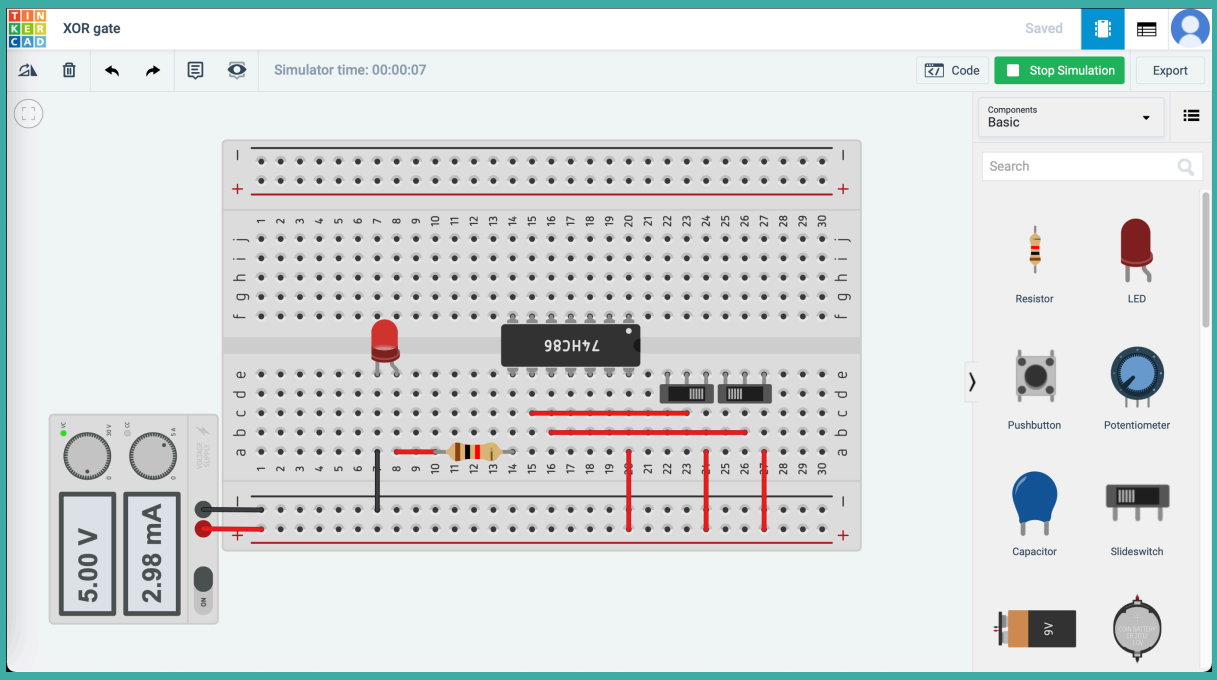
Link of TINKERCAD Workspace: https://www.tinkercad.com/things/koxfRdyyDfT

Pin Diagram of the IC (If Applicable):



74HC04

Circuit Diagram: Screen shot



Truth Table:

X	*NOT X*
0	1
1	0

K maps (If Applicable):

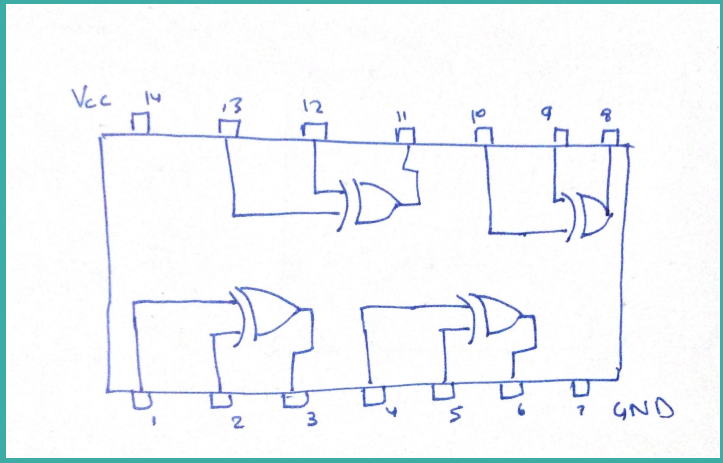
Observations/Results: We can conclude that output of not gate in Tinkercad verifies the truth table.

Aim: Testing output of XOR gate using Tinkercad

Components/ICs Used: Breadboard, Red LED, 1 kΩ Resistor, [5,5 Power Supply], Wire, slideswitch, Quad XOR gate(74HC86)

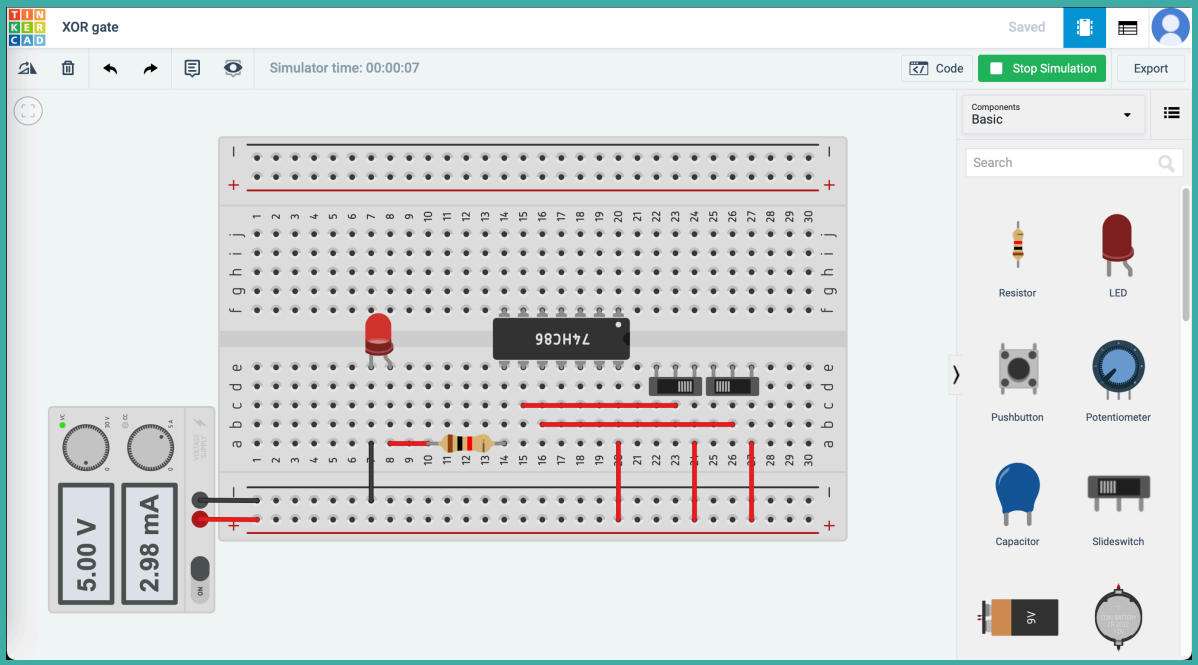
Link of TINKERCAD Workspace: https://www.tinkercad.com/things/20iPVVIRgwy

Pin Diagram of the IC (If Applicable):



74HC86

Circuit Diagram: Screen shot



Truth Table:

X	*Y*	*X XOR Y*
0	0	0
0	1	1
1	0	1
1	1	0

K maps (If Applicable):

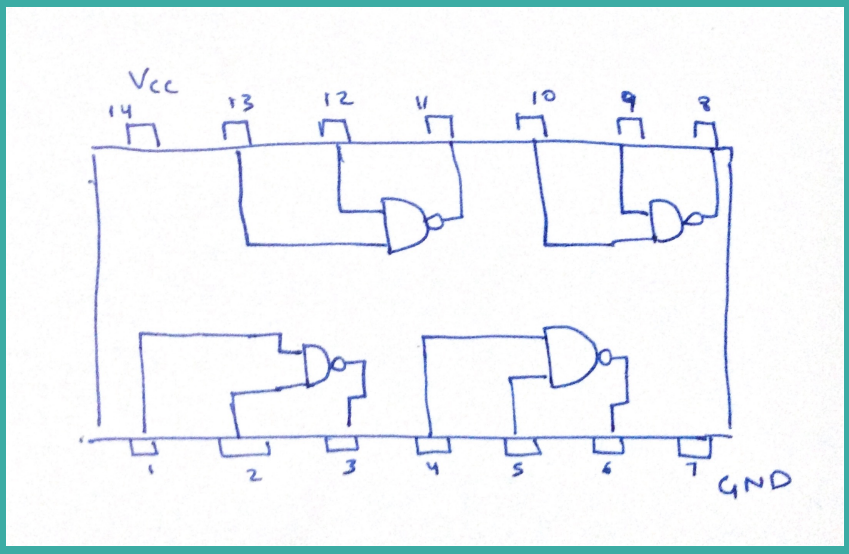
Observations/Results: We can conclude that output of xor gate in Tinkercad verifies the truth table.

Aim: Testing output of NAND gate using Tinkercad

Components/ICs Used: Breadboard, Red LED, 1 kΩ Resistor, [5,5 Power Supply], Wire, slideswitch, Quad NAND gate(74HC00)

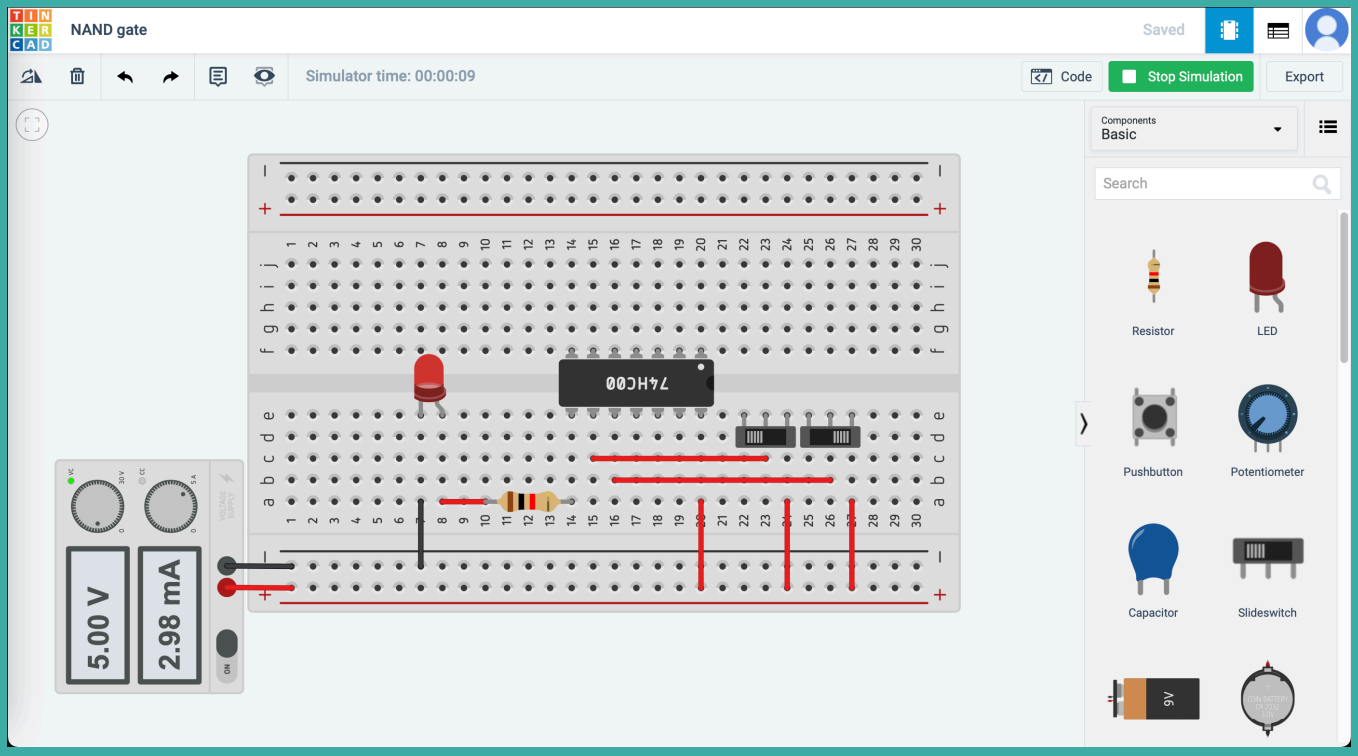
Link of TINKERCAD Workspace: https://www.tinkercad.com/things/6WLQNEYKkCi

Pin Diagram of the IC (If Applicable):



74HC00

Circuit Diagram: Screen shot



Truth Table:

X	*Y*	*X NAND Y*
0	0	1
0	1	1
1	0	1
1	1	0

K maps (If Applicable):

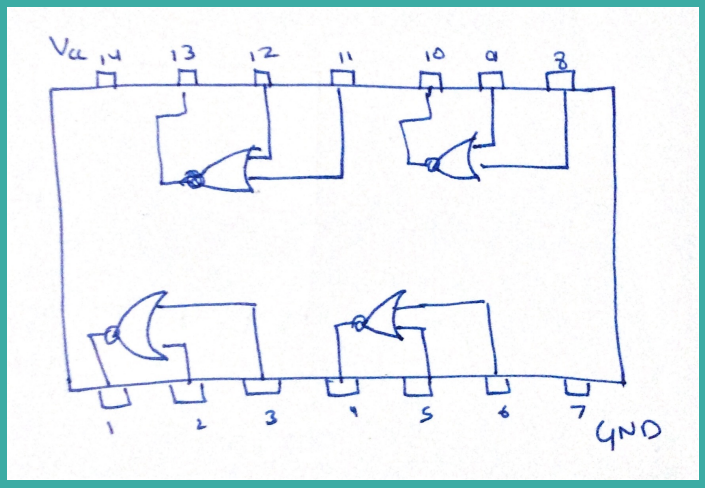
Observations/Results: We can conclude that output of nand gate in Tinkercad verifies the truth table.

Aim: Testing output of NOR gate using Tinkercad

Components/ICs Used: Breadboard, Red LED, 1 kΩ Resistor, [5,5 Power Supply], Wire, slideswitch, Quad NOR gate(74HC02)

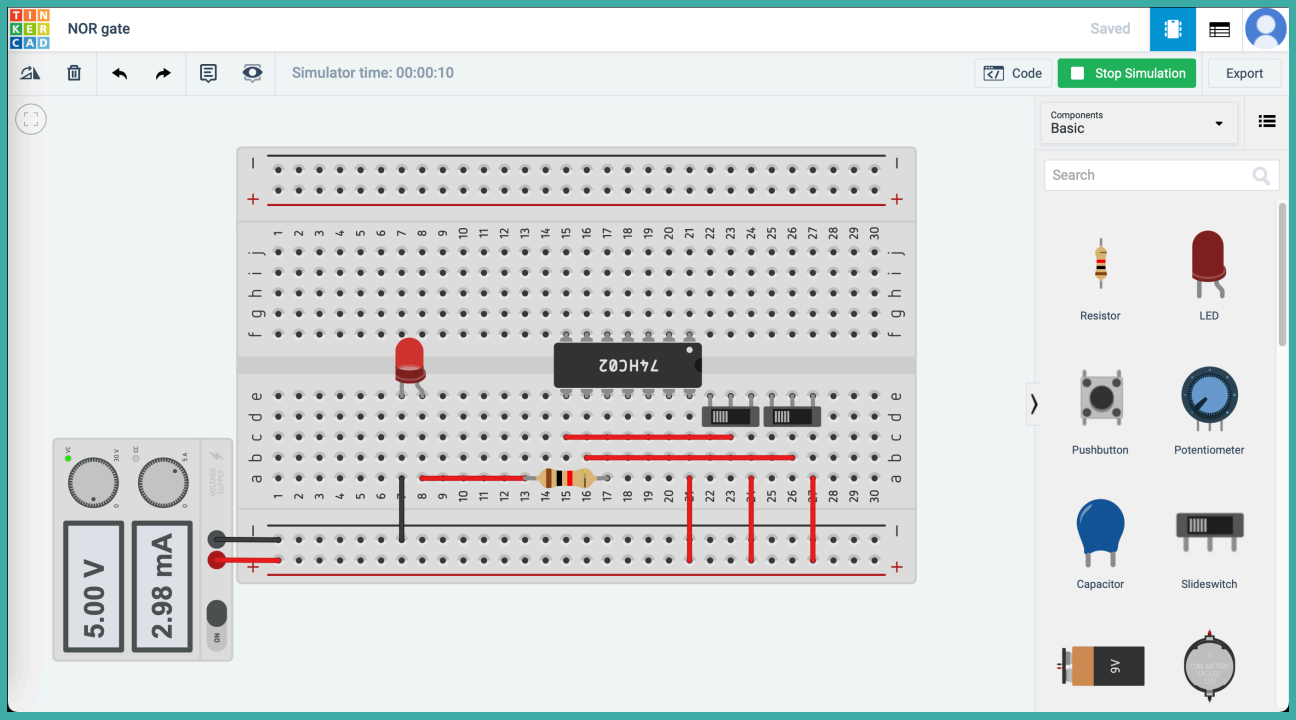
Link of TINKERCAD Workspace: https://www.tinkercad.com/things/2mrKGG5DGuT

Pin Diagram of the IC (If Applicable):



74HC02

Circuit Diagram: Screen shot



Truth Table:

X	Y	X NOR Y
0	0	1
0	1	0
1	0	0
1	1	0

K maps (If Applicable):

Observations/Results: We can conclude that output of nor gate in Tinkercad verifies the truth table.