

Lab_1:

Student Name :Shivam Agarwal
Roll No. : 2020123
Date : 22/1/2021

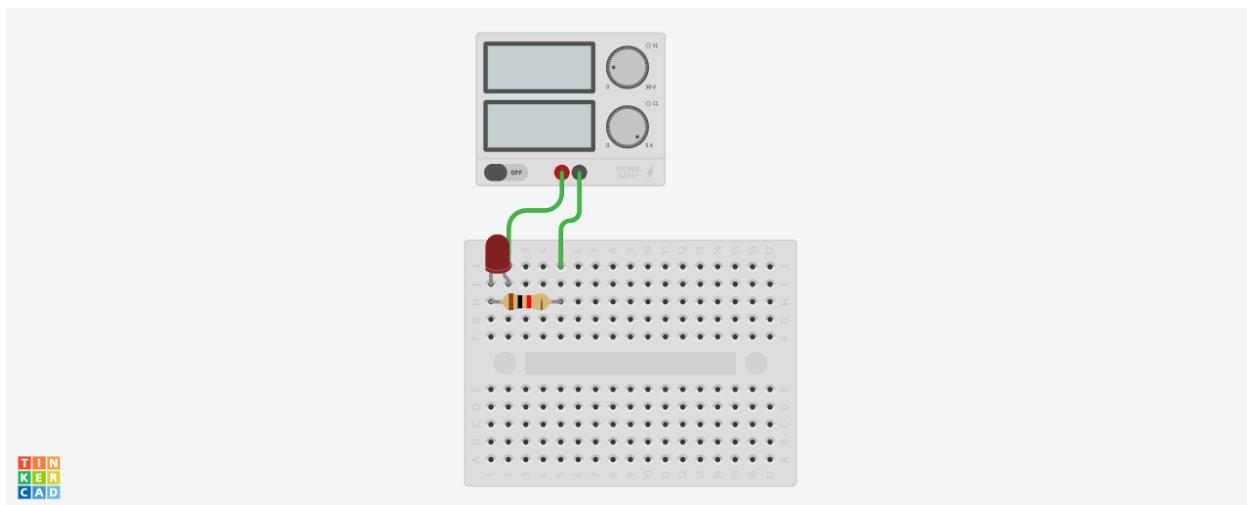
Aim 1 : Make a circuit on tinkercad for operating a LED using a switch

Components/ICs Used: power supply, resistor(1kohm), LED, breadboard

Link of TINKERCAD Workspace:

https://www.tinkercad.com/things/jKz4G3ILemS-terrific-lappi/edit?sharecode=IT DLLvG_M4wfozamXiaV-JfGEoHnzCI5tDB_jMUCNJE

Circuit Diagram:



Observations/Results:

When the potential difference applied by the power supply is 5 volts then around 3.1 mA currents flows in the circuit.

Aim 2 : Show the working of AND,OR,NAND,NOR,XOR gates using ICs

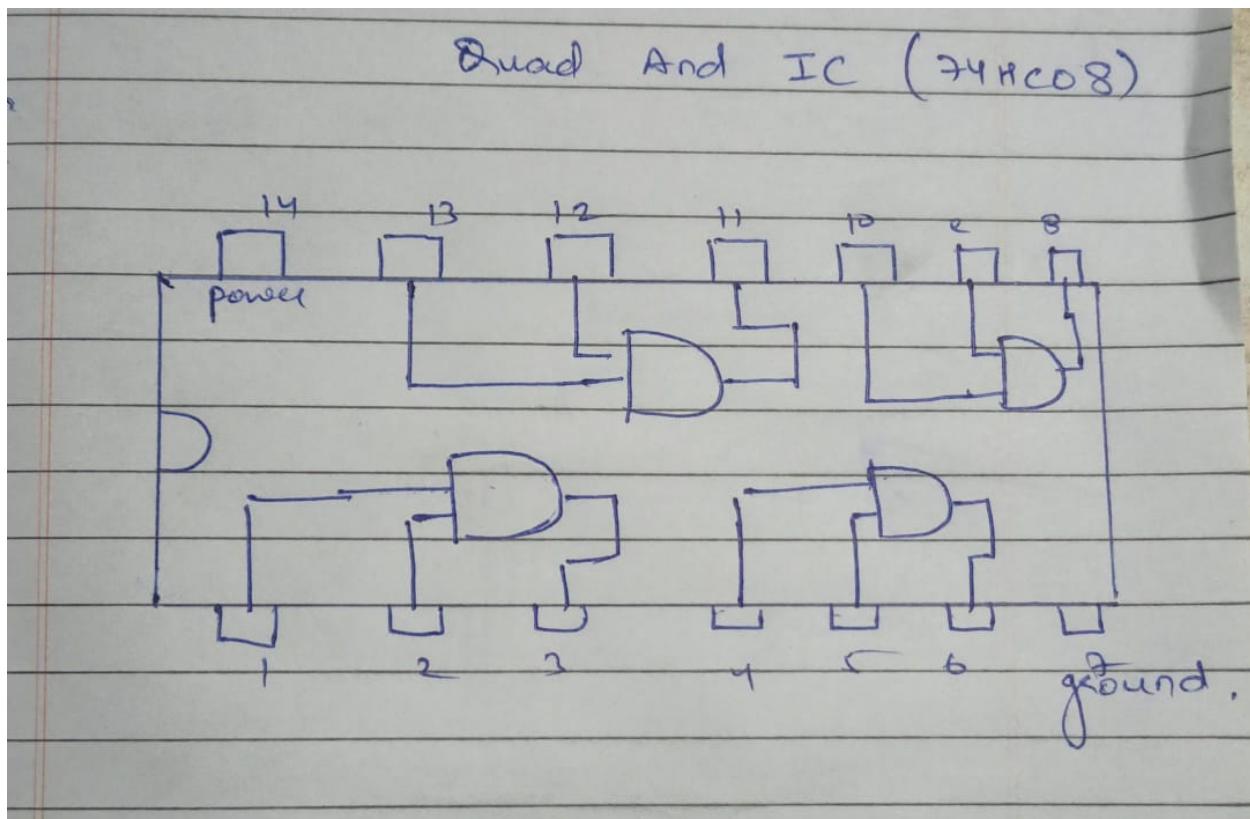
1) AND gate

Components/ICs Used: 1 power supply, 1 LED, 2 slide switch, 1 resistor(1 kohm), 1 Quad And gate

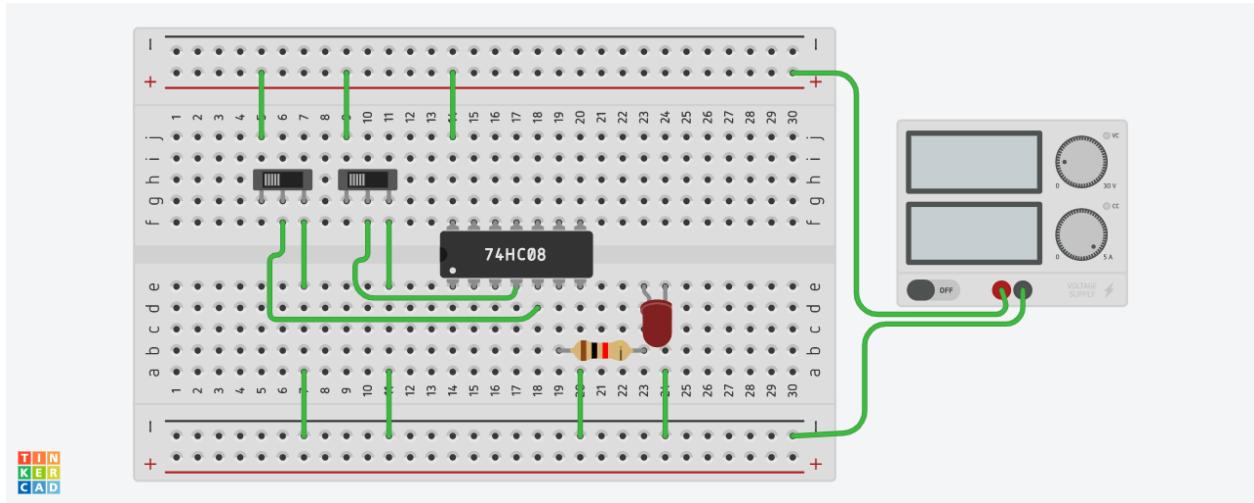
Link of TINKERCAD Workspace:

https://www.tinkercad.com/things/7mXTIQwOkon-brave-lappi-snaget/editel?share_code=l2t6CI22US_3C5v9RNGdbJwlrqCjGB_OiaRhKuerpfw

Pin Diagram of the IC (If Applicable):



Circuit Diagram:



Truth Table:

A	B	A.B
0	0	0
0	1	0
1	0	0
1	1	1

Observations/Results:

The AND gate gives the output 1 only when both the inputs are true.

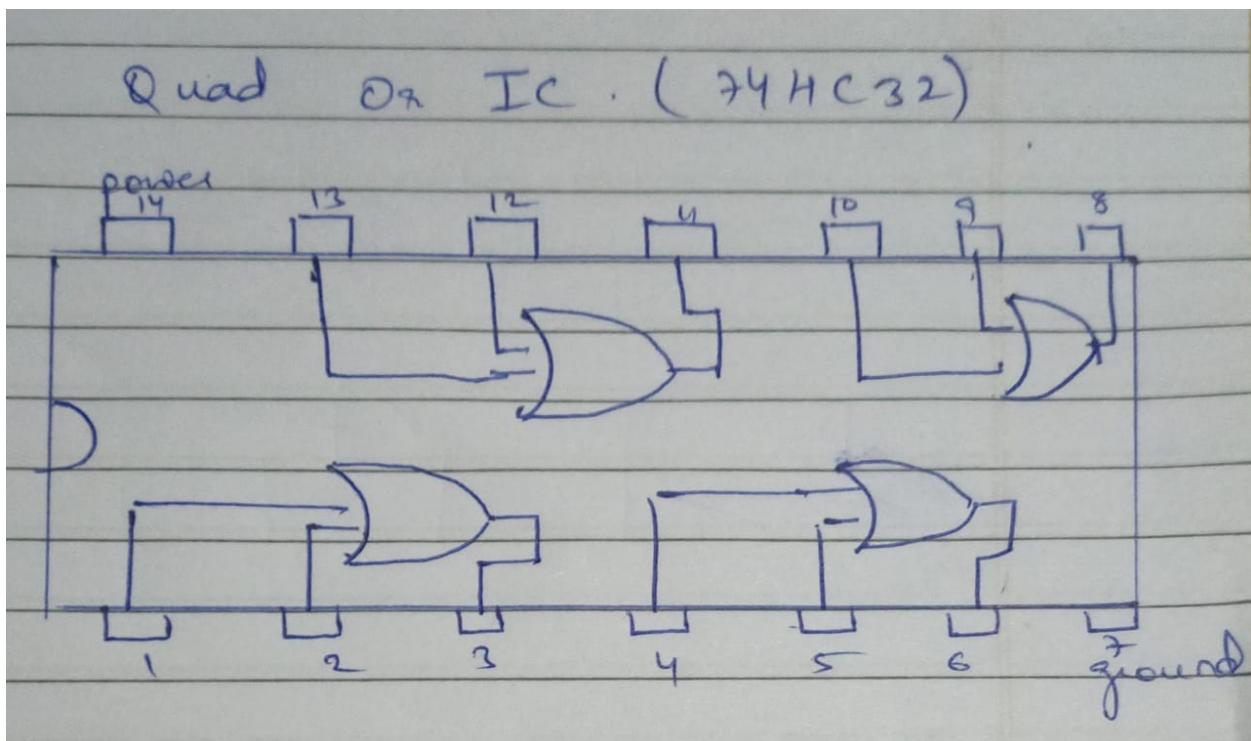
2) OR gate

Components/ICs Used: 1 power supply, 1 LED, 2 slide switch, 1 resistor(1 kohm), 1 Quad Or gate

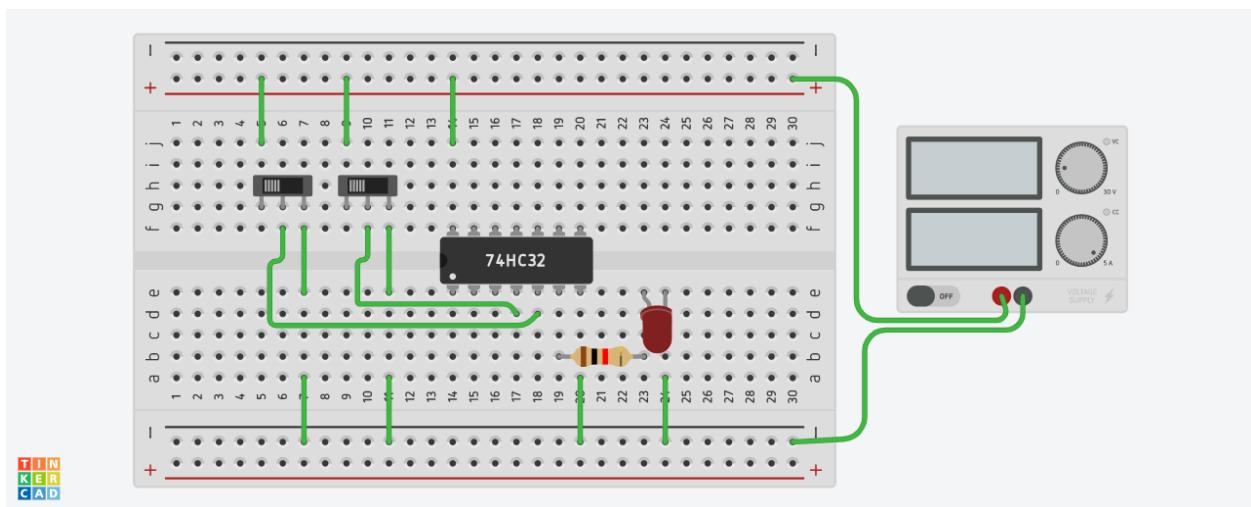
Link of TINKERCAD Workspace:

https://www.tinkercad.com/things/000Xxz1b4e-copy-of-and-gate/editel?sharecode=Bh7dAOH_yIK9I2ce-vDZCznTntMR9koq8h2yDjsECdY

Pin Diagram of the IC (If Applicable):



Circuit Diagram:



Truth Table:

A	B	A+B
0	0	0
0	1	1
1	0	1
1	1	1

Observations/Results:

The OR gate gives the output 1 when either 1 or both the inputs are true.

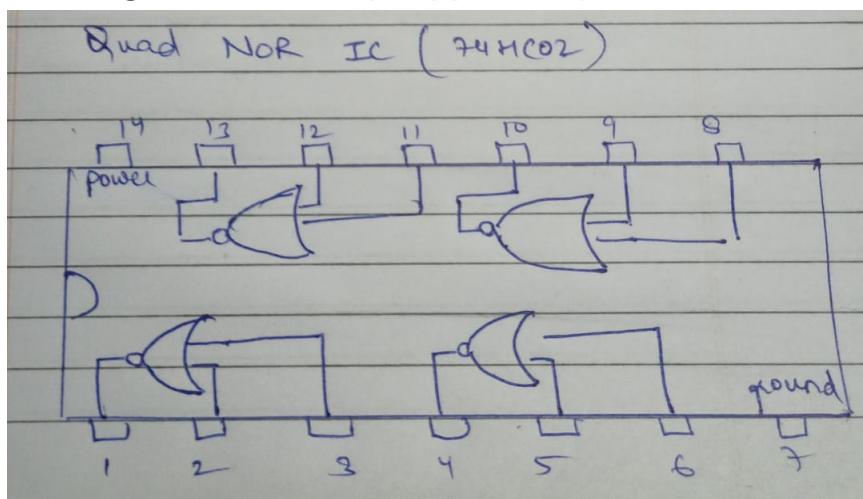
3) NOR gate

Components/ICs Used: 1 power supply, 1 LED, 2 slide switch, 1 resistor(1 kohm), 1 Quad NOR gate

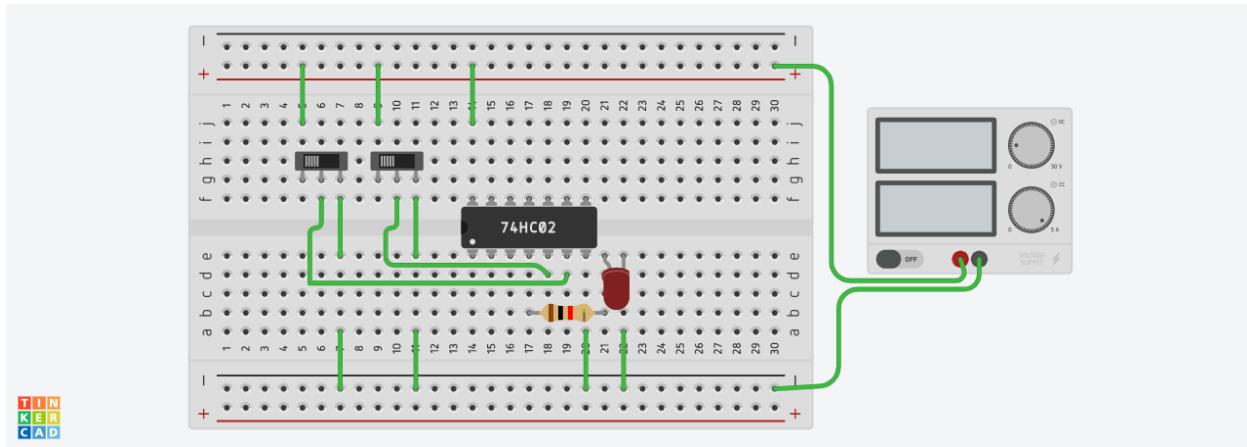
Link of TINKERCAD Workspace:

<https://www.tinkercad.com/things/646BcqBOYui-copy-of-or-gate/editel?sharecode=r1I3rA95WX7SpVr1EYCfd7vOu91oGoyPfgkU3hEuJ1A>

Pin Diagram of the IC (If Applicable):



Circuit Diagram:



Truth Table:

A	B	$(A+B)'$
0	0	1
0	1	0
1	0	0
1	1	0

Observations/Results:

The NOR gate gives the output 1 only when both the inputs are false.

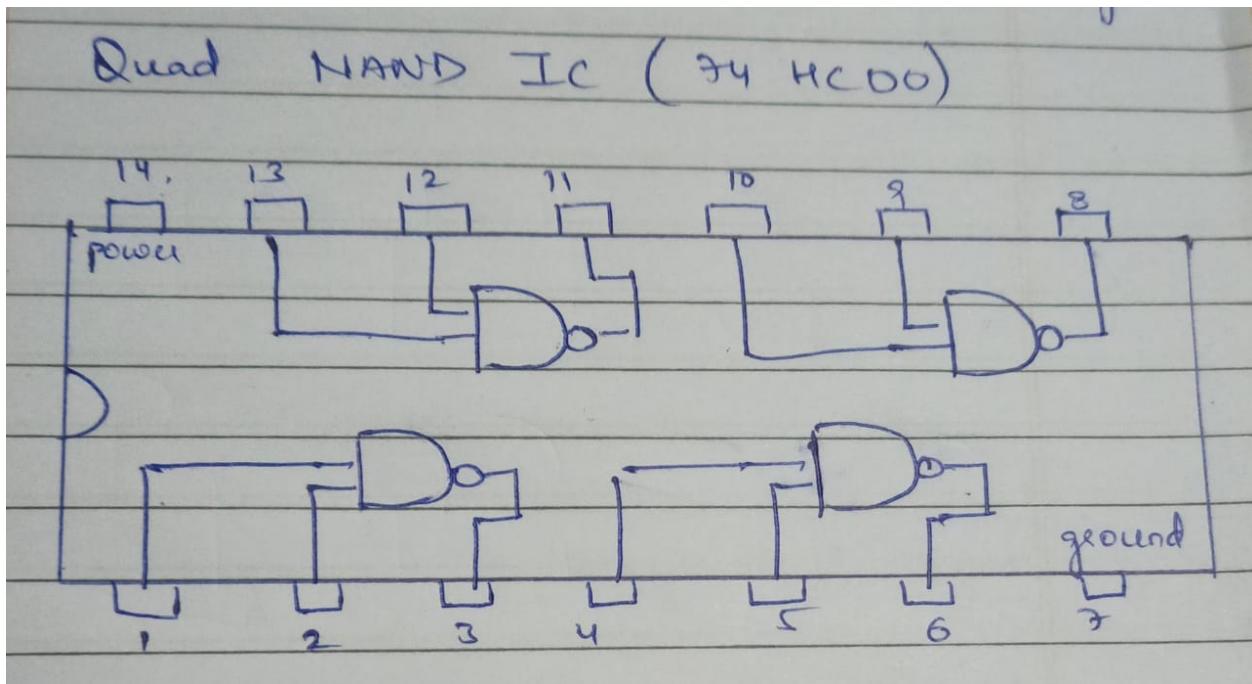
4) NAND gate

Components/ICs Used: 1 power supply, 1 LED, 2 slide switch, 1 resistor(1 kohm), 1 Quad NAND gate

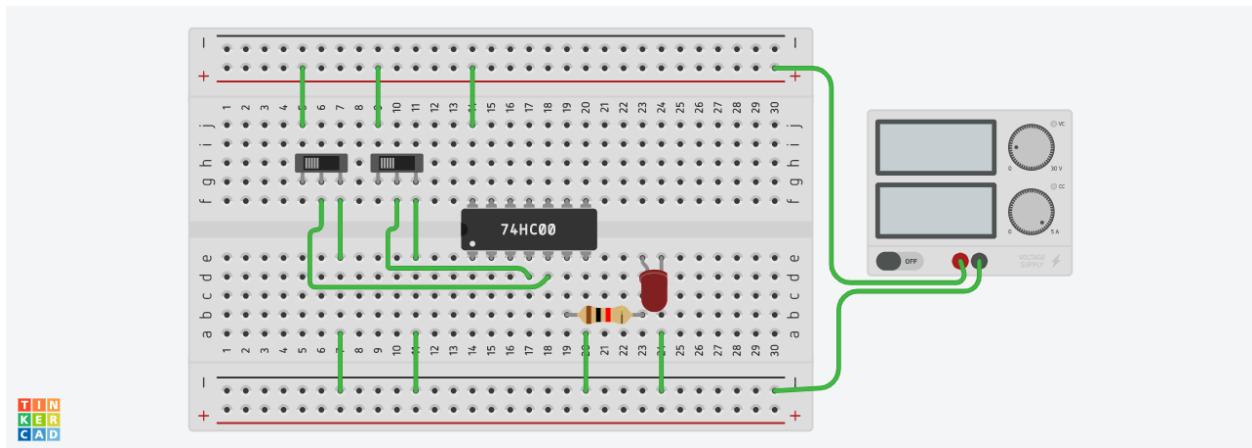
Link of TINKERCAD Workspace:

<https://www.tinkercad.com/things/587wFRrBNMi-copy-of-or-gate/editel?sharecode=Sw60M1kpoCtESi4UuvyLBp7yawGzpHF5aHXDxBOLnEE>

Pin Diagram of the IC (If Applicable):



Circuit Diagram:



Truth Table:

A	B	$(A \cdot B)'$
0	0	1
0	1	1
1	0	1
1	1	0

Observations/Results:

The NAND gate always gives the output 1 except when both the inputs are true.

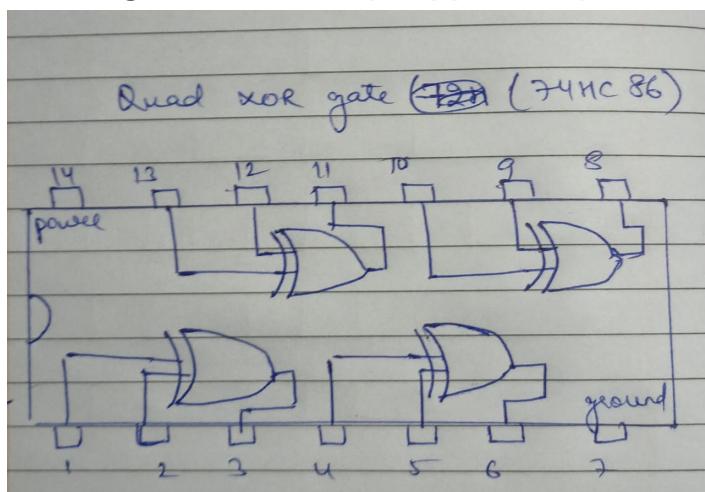
5) XOR gate

Components/ICs Used: 1 power supply, 1 LED, 2 slide switch, 1 resistor(1 kohm), 1 Quad XOR gate

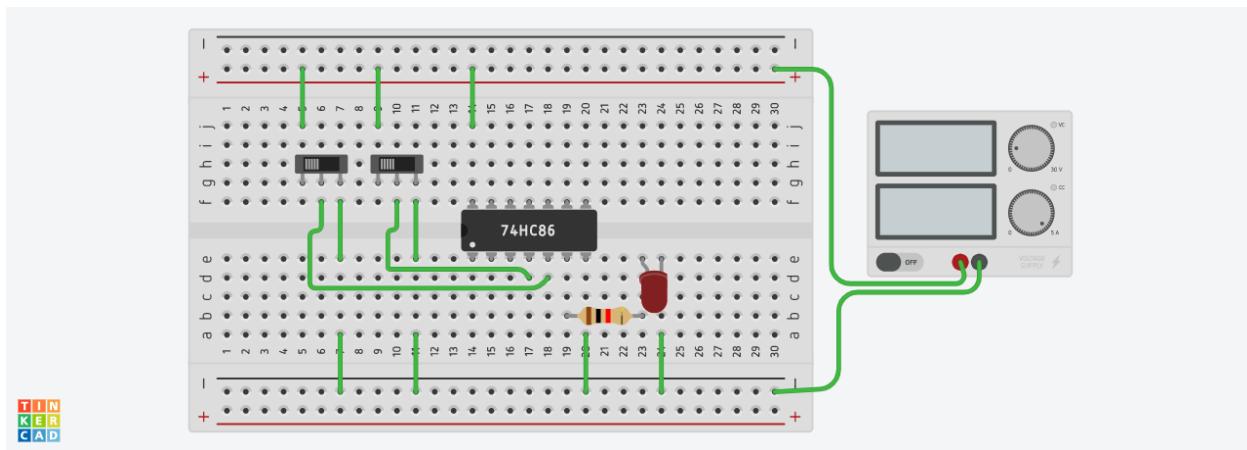
Link of TINKERCAD Workspace:

<https://www.tinkercad.com/things/dF4Km5VpjHU-copy-of-nand-gate-/editel?sharecode=9c6kolFwjk2F4sbaTkob2nYiqLdtS-T6SRSqRYObs7g>

Pin Diagram of the IC (If Applicable):



Circuit Diagram:



Truth Table:

A	B	$A \oplus B$
0	0	0
0	1	1
1	0	1
1	1	0

Observations/Results:

The XOR gate gives the output 1 only when either one of the inputs are true but not both.