Lab Report – 1

Experiment 1: Testing Not Gate

Moida Praneeth Jain (2022101093, Group 4, Table 16)

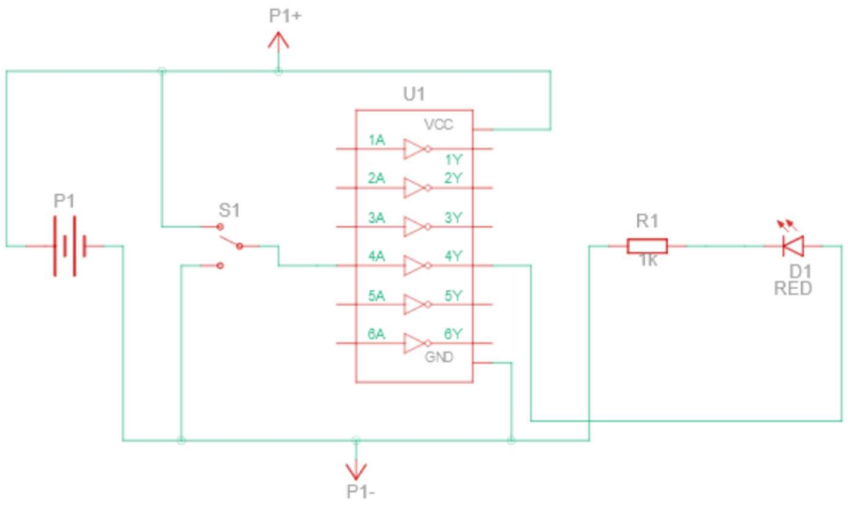
Objective

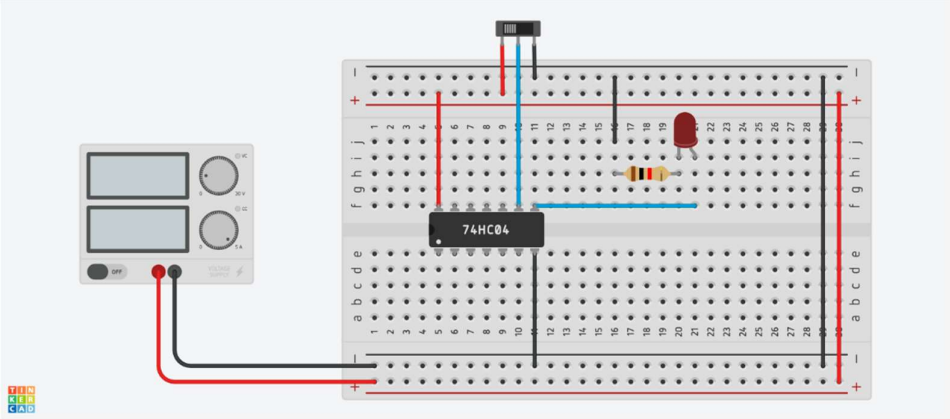
- Understanding the components and usage of the digital test kit.
- Measuring Voltage between VCC and GND pins.
- Verify working of input pins and output LEDs.
- Verify 7404 IC (6 NOT gates).

Electronic Components Required

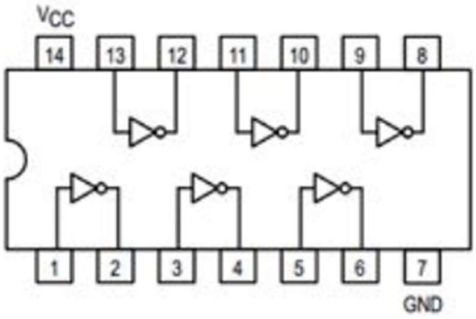
- Power Supply
- Breadboard
- LED
- Resistor
- 7404 IC (Hex Inverter)
- Switch
- Wires

The Reference Circuit





IC:

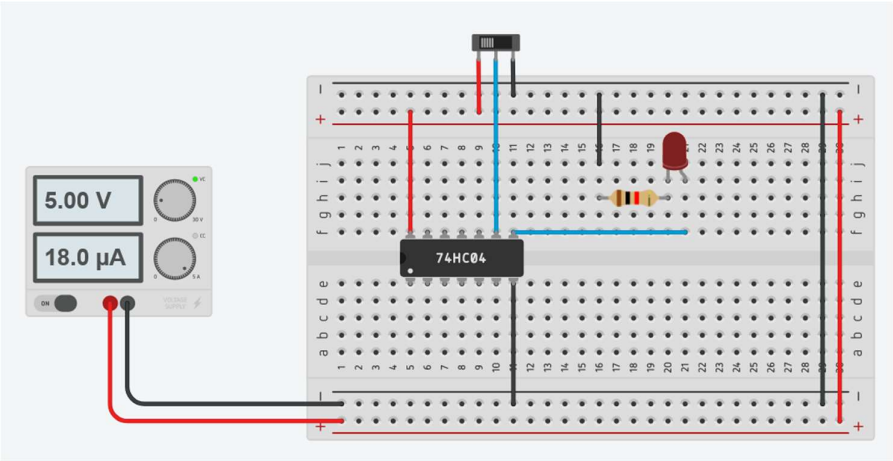


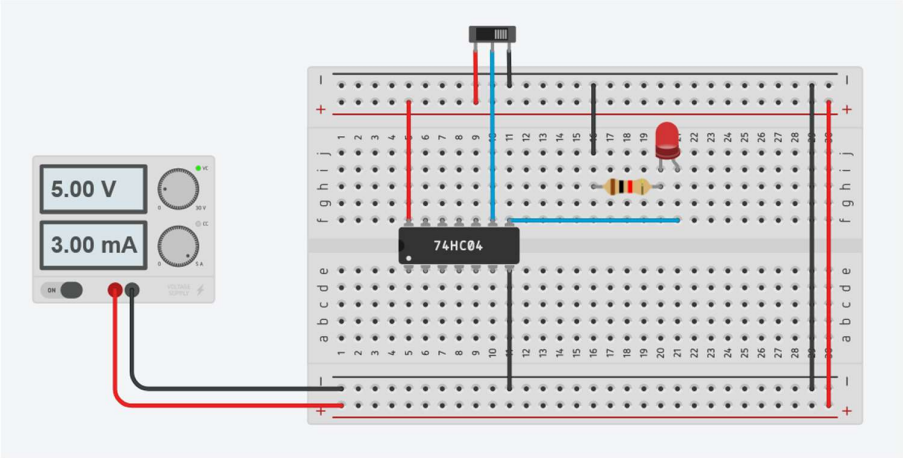
Procedure

- Use multimeter to measure voltage between VCC and GND.
- Connect input switches to LED to verify that they are working.
- Connect the IC onto the breadboard.
- Connect VCC to the VCC pin of the IC, and connect GND to the GND pin of the IC (using red and black wires respectively).
- Connect output of any switch to each input switch of the IC, and connect the corresponding output to LED's anode.
- Connect LED's cathode to GND through a resistor.
- Turn the power supply on.

Observation

- When the input switch is on, the LED is green.
- When the output switch is off, the LED is red.





Conclusion

The NOT Gates are functioning as expected.

TinkerCAD simulation link:

https://www.tinkercad.com/things/26rGVuvhCry-experiment-1/editel?sharecode=xx54mB6UG6GT_MbxxYydsvaarcaJMiOoTPbwpHqZvtA

Experiment 2: Testing Arduino

Moida Praneeth Jain (2022101093, Group 4, Table 16)

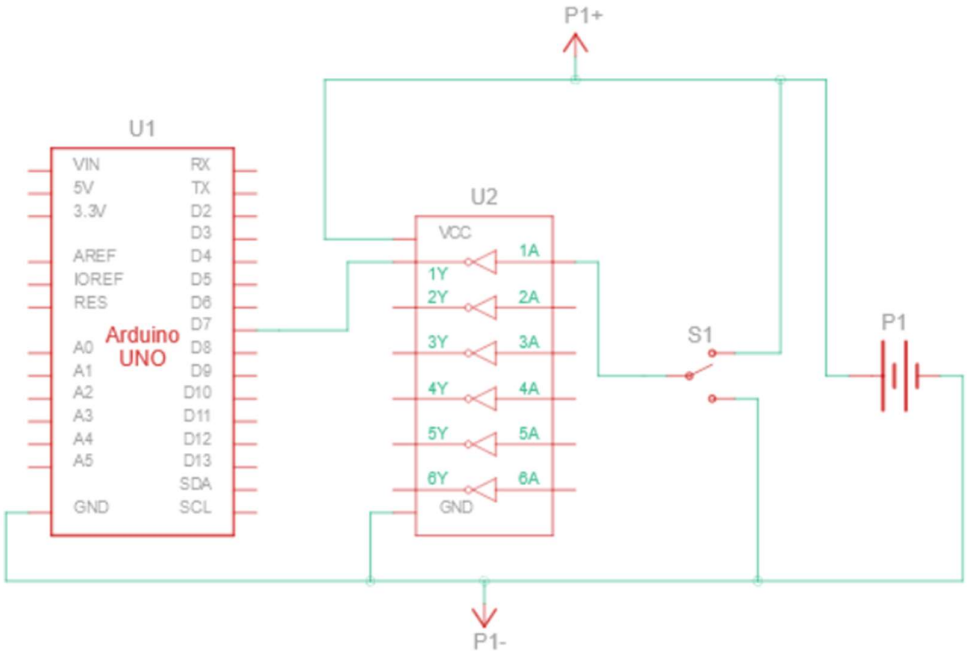
Objective

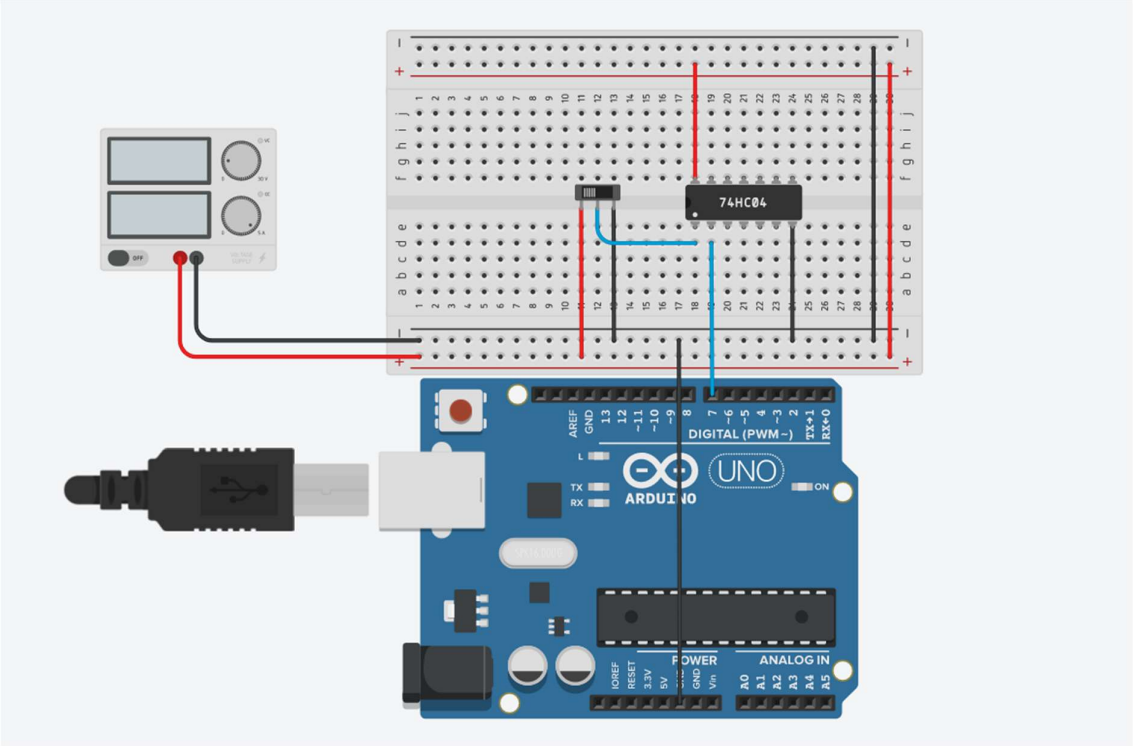
- Connect Arduino Uno to breadboard and output “Hello World” in the serial monitor when output of NOT gate is 1 and output nothing when output of NOT gate is 0.

Electric Components Required

- Power Supply
- Breadboard
- Arduino Uno
- 7404 IC (Hex Inverter)
- Wires
- Switch

The Reference Circuit





Code

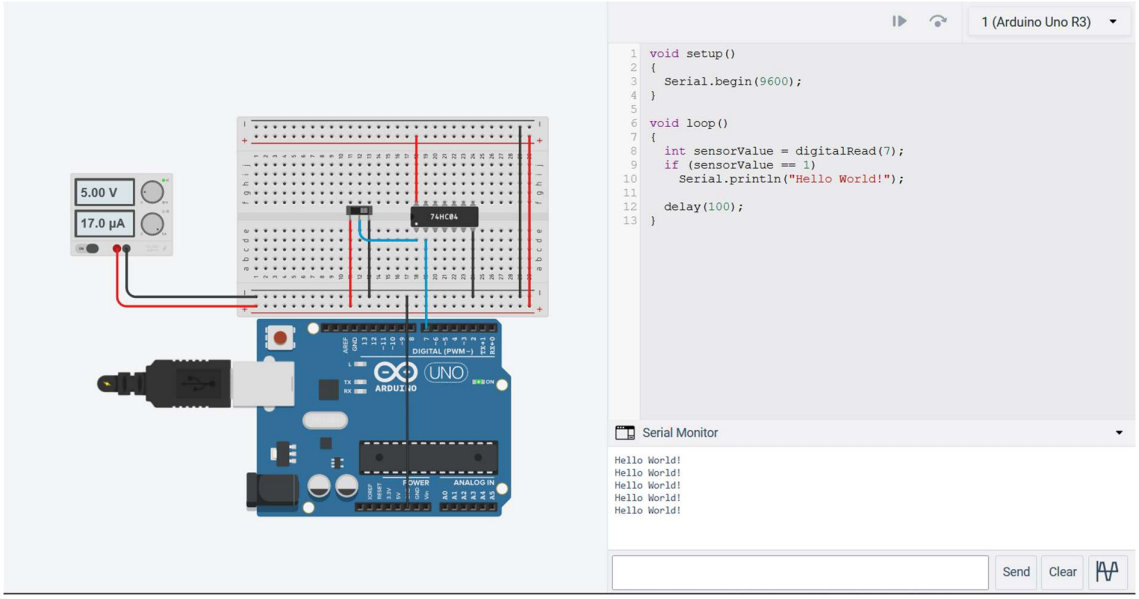
```
void setup()
{
  Serial.begin(9600);
}

void loop()
{
  int sensorValue = digitalRead(7);
  if (sensorValue == 1)
    Serial.println("Hello World!");

  delay(100);
}
```

Procedure

- Connect the IC onto the breadboard.
- Connect VCC to the VCC pin of the IC and GND to the GND pin of the IC (with red and black wires respectively).
- Connect GND to GND of Arduino.
- Connect output of any switch to any input of the IC, and connect the corresponding output to a digital input pin of the Arduino.
- Connect the Arduino to your PC and load the code using Arduino IDE.
- Turn the power supply on.

Observation

- When the switch is off, “Hello World” is printed on the serial monitor. When the switch is on, nothing is printed.



Conclusion

The Arduino is working as expected

TinkerCAD simulation link:

https://www.tinkercad.com/things/kyuP9PE0Kcp-experiment-2/editel?sharecode=KyIsZ7Gj3oFpofBOUQ44KDfoJ7GKuoxLFDxtNS9m6wU