



University of Asia Pacific

Department of Computer Science and Engineering

CSE 316: Microprocessors and

Microcontrollers Lab

LAB REPORT

Experiment Number: 06

Experiment Title: Remote AC Bulb Control

Submitted by:

Name : Rahima Kamal Rahi

Student ID : 22201114

Section : C2

Submitted to:

Zaima Sartaj Taheri

Lecturer,

Department of Computer Science and Engineering

1. Experiment Name

Remote AC Bulb Control.

2. Objective

The objective of this experiment is to design and implement a remote-controlled AC bulb switching system using an Arduino and an IR (Infrared) receiver module. The system allows a user to turn the bulb ON or OFF wirelessly using an IR remote.

Specific Objectives:

- To interface an IR receiver sensor with the Arduino.
- To detect and decode IR signals sent from a remote control.
- To control an AC bulb (simulated by LED or relay) based on received IR signals.
- To gain practical experience in wireless communication and embedded system automation.

3. Apparatus / Hardware & Software Requirements

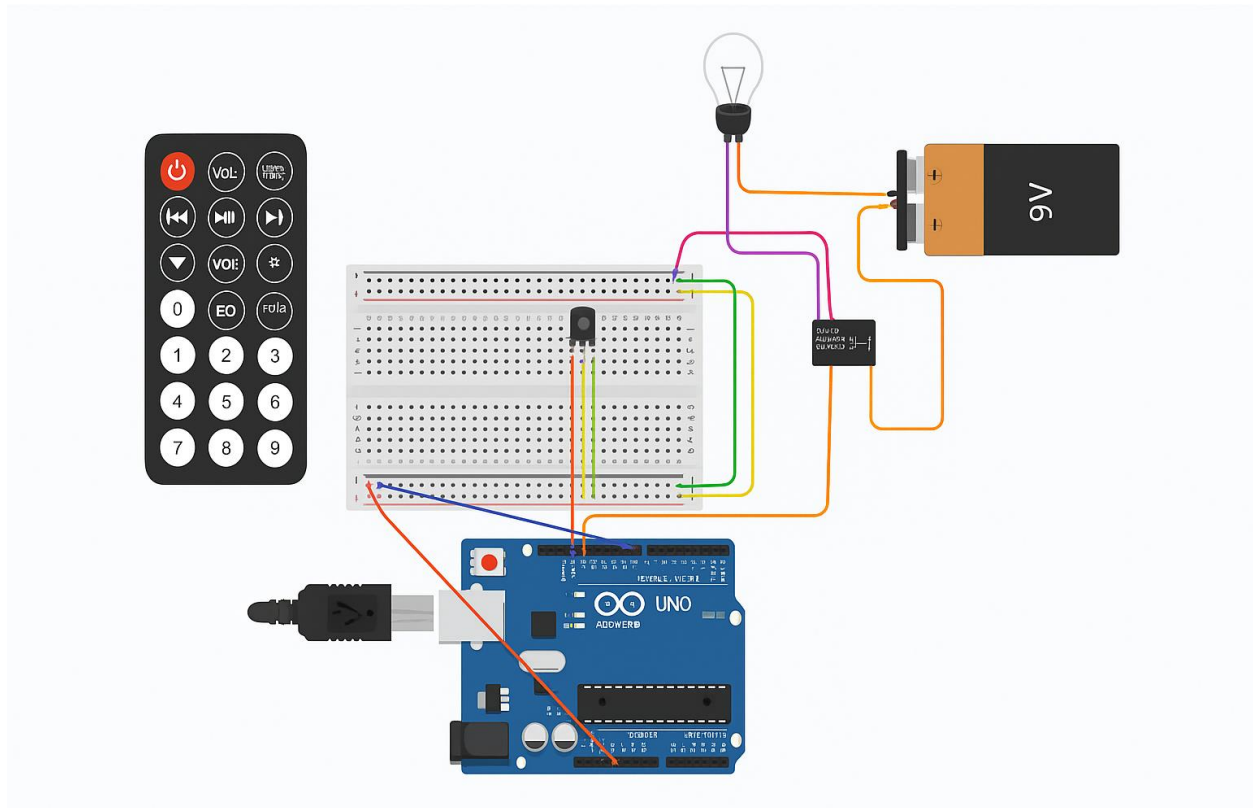
Hardware Requirements:

- Arduino Uno R3 (Microcontroller Board)
- IR Receiver Sensor (e.g., TSOP1738 or HX1838)
- IR Remote Control
- Relay Module (for controlling AC bulb) or LED (for simulation)
- Jumper Wires
- Breadboard
- External Power Supply (if required)

Software Requirements:

- Arduino IDE (for coding and uploading the program)
- Tinkercad (for simulation, if testing virtually)

4. Circuit Diagram / Schematic



5. Code / Assembly Program

```
#include <IRremote.hpp>

const int rcvPin=3;
int releNO = 13;
IRrecv irrecv(rcvPin);

decode_results results;

void setup()
{
  Serial.begin(9600);
  irrecv.enableIRIn(); // Start the receiver

  pinMode(13, OUTPUT);
```

```

}
void loop() {

  if(IrReceiver.decode()) {
    auto value= IrReceiver.decodedIRData.decodedRawData;
    //switch(results.value)
    switch(value)
    {
      case 4010852096:
        Serial.println("1"); // Button 1
        digitalWrite(13,HIGH);
        break;

      case 3994140416: //Template
        Serial.println("2"); // Button
        digitalWrite(13,LOW);
        break;

      default: Serial.println(value);
    }
    IrReceiver.resume(); // Receive the next value
  }
}

```

6. Output / Observations

- When the **IR remote button “1”** was pressed, the **relay (or LED)** turned **ON**, simulating the bulb being switched on.
- When the **IR remote button “2”** was pressed, the **relay (or LED)** turned **OFF**, simulating the bulb being switched off.
- The **Serial Monitor** displayed decoded values and confirmed which button was pressed.
- The system responded **instantly** and **accurately** to IR commands without false triggering.
- Continuous testing showed stable performance, and the receiver consistently detected valid signals.

7. Result

The method for controlling the remote AC bulbs was successfully put into place. In order to control the relay (or LED) output in response to commands from the IR remote, the Arduino precisely decoded the received infrared signals. The system proved that Arduino and infrared communication may be successfully combined for home automation applications by exhibiting dependable wireless functioning.

8. Conclusion

An Arduino and an infrared remote control were used in this project to construct a basic wireless home automation system. The Arduino demonstrated the use of embedded systems and infrared technologies in smart home solutions by successfully deciphering signals from the remote to operate a simulated AC bulb.

The project demonstrated the ease with which microcontrollers may be used to automate repetitive operations while providing practical experience in hardware integration, signal decoding, and real-time control.