University of Asia Pacific

Department of Computer Science and Engineering

CSE 316: Microprocessors and Microcontrollers Lab

LAB REPORT

Experiment Number: 6

Experiment Title: Arduino-Based IR Remote Controlled AC Bulb.

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1. Experiment Name

- Mini Project 6: Arduino-Based IR Remote Controlled AC Bulb.

2. Objective

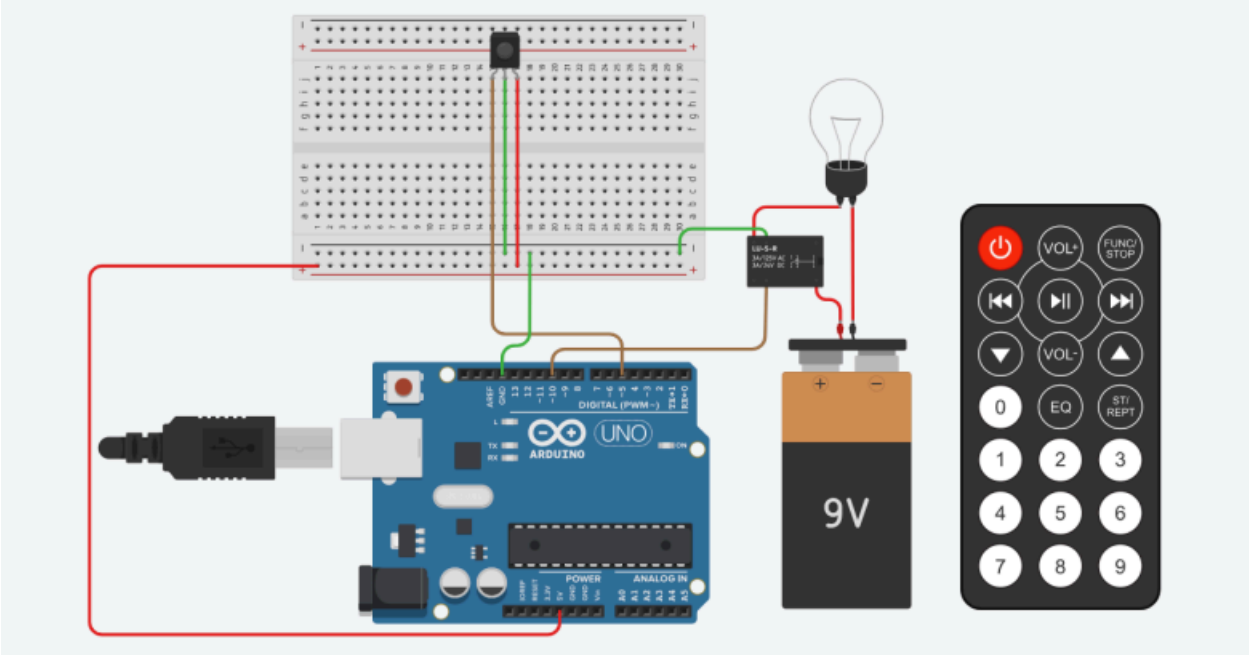
-To create a system that allows wireless control of an AC bulb using an IR remote and Arduino for convenient home automation.

3. Apparatus / Hardware & Software Requirements

- List all required tools and components:

- Microcontroller (Arduino uno R3)
- Sensors / Actuators (Light (AC Bulb), Ir remote and sensor , Buzzer, Relay Spdt)
- Software (Arduino IDE,Tinkercad)
- Breadboard, Jumper Wires, Power Source, resistors etc.

4. Circuit Diagram / Schematic



5. Code / Assembly Program

```
#include <IRremote.hpp>


const int RelayPIN = 10;        // Relay control pin
```

```
const int irReceiverPIN = 5;    // IR receiver pin


void setup() {
  pinMode(RelayPIN, OUTPUT);
  digitalWrite(RelayPIN, LOW); // Relay OFF initially
  Serial.begin(9600);
  IrReceiver.begin(irReceiverPIN, ENABLE_LED_FEEDBACK);
}


void loop() {
  if (IrReceiver.decode()) {
    unsigned long RemoteCode = IrReceiver.decodedIRData.decodedRawData;


    switch (RemoteCode) {
      case 4077698816UL:  // (0)Button → On
        digitalWrite(RelayPIN, HIGH);
        break;


      case 4278238976UL:  // (power)Button → Off
```

```
      digitalWrite(RelayPIN, LOW);
      break;

    default:
      break;
  }
  IrReceiver.resume(); // Ready for next signal
 }
}
```

6. Output / Observations

1. The AC bulb turns ON when the specific IR remote button is pressed.
2. The AC bulb turns OFF when another IR remote button is pressed.
3. A relay module clicks audibly to indicate switching state changes.
4. An LED indicator lights up to show when the relay is activated.

7. Result

The system successfully controlled the AC bulb wirelessly using IR remote commands, with the relay and LED providing clear operational feedback for each command.

8. Conclusion

This project successfully demonstrated how to safely control high-voltage AC devices using low-voltage Arduino systems with IR technology. We learned about relay isolation, IR signal decoding, and electrical safety, creating a practical foundation for smart home applications.