

Smart Home Automation

- Using Arduino Uno, Bluetooth & Relay Module

Introduction

- Smart Home Automation allows control of appliances using wireless technology like Bluetooth.

Objective

- Control home appliances wirelessly using mobile phone.
- Learn Arduino + Bluetooth communication.

Components Used

- Arduino Uno
- Bluetooth Module (HC-05)
- Relay Module
- Mobile Phone
- Jumper Wires

Working Principle

- Mobile sends signal via Bluetooth.
- HC-05 receives data.
- Arduino processes input.
- Relay controls appliances.

Circuit Diagram

- HC-05 TX -> Arduino RX
- HC-05 RX -> Arduino TX
- Relay IN -> Arduino pin 7

Code :

- `char data; // Variable to store Bluetooth data`
- `void setup() {`
- `Serial.begin(9600); // Communication with HC-05`
- `pinMode(7, OUTPUT); // Relay connected to pin 7`
- `digitalWrite(7, LOW); // Initially OFF`
- `}`
- `void loop() {`
- `if (Serial.available() > 0) {`
- `data = Serial.read(); // Read incoming data`

```
// DEVICE ON
if (data == 'A') {
    digitalWrite(7, HIGH); // Turn ON relay
}

// DEVICE OFF
else if (data == 'B') {
    digitalWrite(7, LOW); // Turn OFF relay
}
}
```

Algorithm

- Start
- Connect Bluetooth
- Send command
- Arduino reads command
- Turn ON/OFF relay

Code Logic

- If input = 'A' → Device ON
- If input = 'B' → Device OFF

Output

- Control light/fan using mobile app via Bluetooth.

Applications

- Smart homes
- Wireless control systems
- Automation projects

Advantages

- Wireless control
- Easy to use
- Low cost

Limitations

- Limited Bluetooth range
- Needs power supply

Future Scope

- Upgrade to WiFi (IoT)
- Voice control integration

Conclusion

- Efficient and simple smart home system using Bluetooth.

Thank You

- Thank you 😊