

```
const int ldrPin = A0;

const int tempPin = A1;

const int lightLED = 8;

const int fanLED = 9;


int ldrThreshold = 500;

float tempThreshold = 30.0;


bool manualMode = false;

bool lightState = false;

bool fanState = false;


void setup() {
    Serial.begin(9600);
    pinMode(lightLED, OUTPUT);
    pinMode(fanLED, OUTPUT);
    Serial.println("Home Automation System Initialized");
    Serial.println("Send 'L'/'I' for Light ON/OFF, 'F'/'f' for Fan ON/OFF, 'A' for Auto Mode.");
}


void loop() {
    // Check for remote commands
    if (Serial.available()) {
        char cmd = Serial.read();
        manualMode = true;

        switch (cmd) {
            case 'L':
                lightState = true;
                break;
            case 'I':
```

```
    lightState = false;

    break;

case 'F':

    fanState = true;

    break;

case 'f':

    fanState = false;

    break;

case 'A':

    manualMode = false;

    Serial.println("Switched to AUTO mode");

    break;

}

}
```

```
int ldrValue = analogRead(ldrPin);

int tempRaw = analogRead(tempPin);

float voltage = tempRaw * (5.0 / 1023.0);

float temperatureC = (voltage - 0.5) * 100;
```

```
if (!manualMode) {

    // Auto Mode

    lightState = (ldrValue < ldrThreshold);

    fanState = (temperatureC > tempThreshold);

}
```

```
digitalWrite(lightLED, lightState ? HIGH : LOW);

digitalWrite(fanLED, fanState ? HIGH : LOW);
```

```
// Display sensor values and current states

Serial.print("Mode: "); Serial.print(manualMode ? "MANUAL" : "AUTO");
```

```
Serial.print(" | LDR: "); Serial.print(ldrValue);  
Serial.print(" | Temp: "); Serial.print(temperatureC); Serial.print(" °C");  
Serial.print(" | Light: "); Serial.print(lightState ? "ON" : "OFF");  
Serial.print(" | Fan: "); Serial.println(fanState ? "ON" : "OFF");  
  
delay(1000);  
}
```