Home Automation Project Using Arduino

Project Overview

This project focuses on home automation using an Arduino Uno and available sensors. It includes:

Motion detection using an **IR Sensor** Temperature-based control using a **DHT11 Sensor** Alert system using a **Buzzer** Fan (or LED) activation when temperature exceeds 30°C

Required Components

Component	Arduino Pin
DHT11 (Temperature & Humidity)	**D2**
IR Sensor (Motion Detection)	**D3**
Buzzer	**D4**
Fan (Relay Output) / LED	**D5**

Circuit Connections

- **DHT11 Sensor**: Connect VCC to 5V, GND to GND, and Data to **D2**.
- **IR Sensor**: Connect VCC to 5V, GND to GND, and OUT to **D3**.
- **Buzzer**: Connect Positive to **D4**, and Negative to GND.
- **Fan/LED**: Connect to **D5** via relay or transistor circuit.

Arduino Code

```
#include <DHT.h>

#define DHTPIN 2

#define DHTTYPE DHT11

DHT dht(DHTPIN, DHTTYPE);

#define IR_SENSOR 3

#define BUZZER 4

#define FAN 5  // Can be used to control a Fan or LED



void setup() {

  Serial.begin(9600);
```

```
    dht.begin();
    pinMode(IR_SENSOR, INPUT);
    pinMode(BUZZER, OUTPUT);
    pinMode(FAN, OUTPUT);
}

void loop() {
    // Read Temperature & Humidity
    float temp = dht.readTemperature();
    float hum = dht.readHumidity();
    // Read IR Sensor
    int irValue = digitalRead(IR_SENSOR);
    // Display Data in Serial Monitor
    Serial.print("Temp: "); Serial.print(temp);
    Serial.print("°C | Hum: "); Serial.println(hum);
    // 1. Motion Detection - Turn ON Buzzer if IR sensor detects motion
    if (irValue == LOW) {
        Serial.println("Motion Detected! Alerting...");
        digitalWrite(BUZZER, HIGH);
        delay(500);
        digitalWrite(BUZZER, LOW);
    }
    // 2. Temperature Control - Turn ON Fan if temp > 30°C
    if (temp > 30) {
        Serial.println("High Temperature! Turning on Fan...");
        digitalWrite(FAN, HIGH);
    } else {
        digitalWrite(FAN, LOW);
    }

    delay(1000);
}
```

How It Works

- **Motion Detected** → Buzzer sounds
- **Temperature above 30°C** → Fan (or LED) turns ON

Install Required Libraries

In Arduino IDE, install:
ESPAsyncWebServer (for handling web requests)
AsyncTCP (needed for ESP32 web server)
DHT sensor library