

Iot-PROJECT
HOME SECURITY AND MAINTENANCE

Group Members Details

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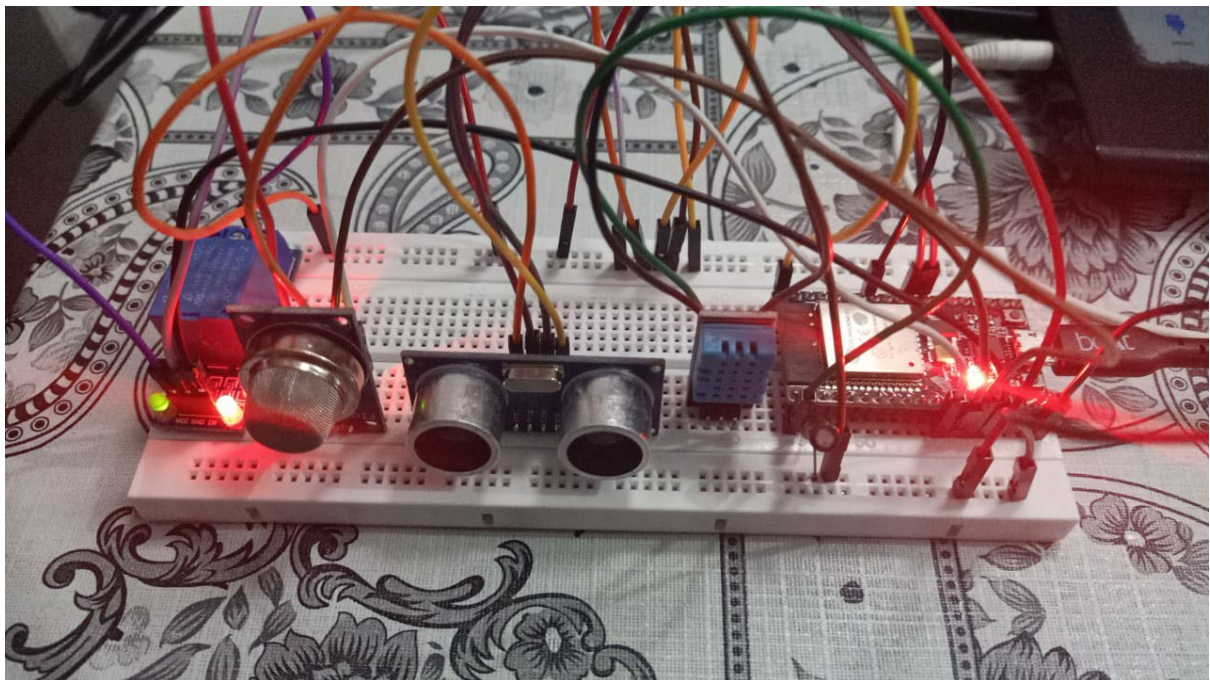
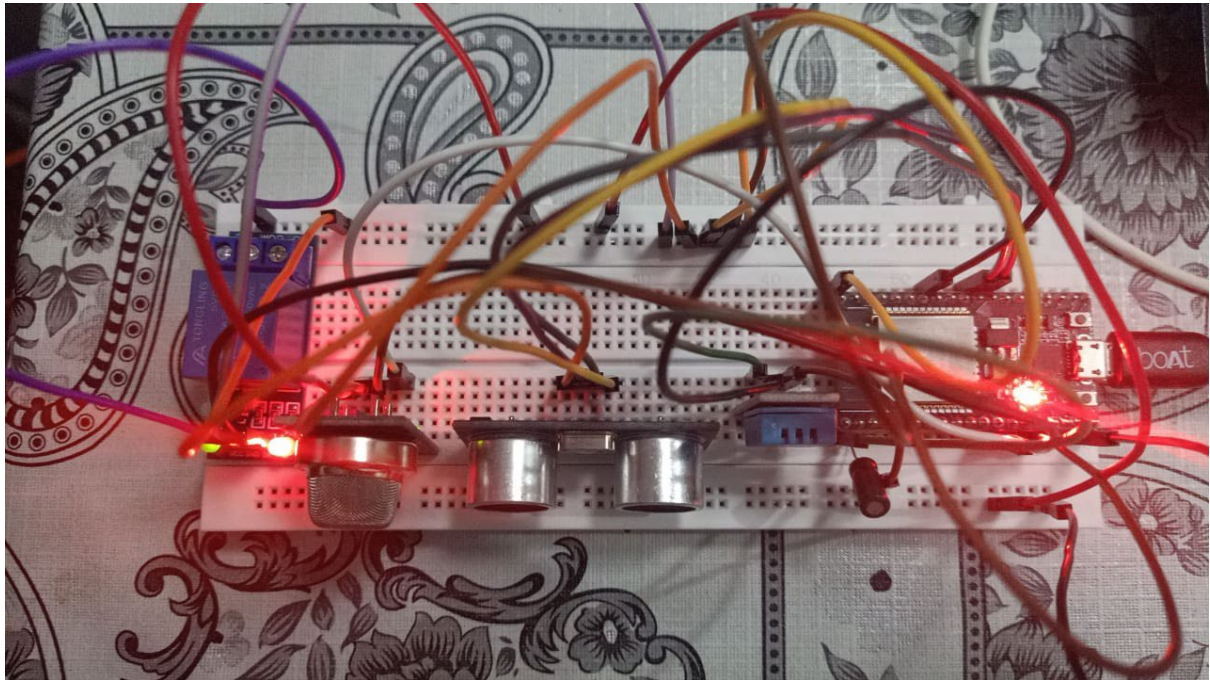
Task:

Design a Home surveillance and maintenance system using IoT platform and relevant sensors.

Requirements:

- PC with Arduino
- Connecting Wires
- Breadboard
- DOIT ESP32 DEVKIT V1
- 10uF Electrolytic Capacitor
- Wire Clipper
- USB Type A to Micro USB Cable
- DC 5V Power Supply
- DC 3.3V Power Supply
- Temperature and humidity sensor(DHT11)
- Gas sensor(MQ135)
- Ultrasonic sensor(HC-SR04)
- Relay module

Circuit Diagram:



Code (if any):

```
#include <UbidotsESPMQTT.h>
#include "DHT.h"
#include <WiFi.h>
#include <IFTTTWebhook.h>
```

```

#define dhtpin 19
#define dhttype DHT11
#define u_trigger 16
#define u_echo 17
#define mq_d 12
#define mq_a 14
#define relay 13

#define token "BBFF-2MHQBnxIVqW5DMUqLh1VzsEhBdNA3b"
#define id "Subhadeep"
#define pass "Subhadeep@123"

#define ifttt_api "lwQRQ6OGbIvHahQguCplu-t8t55IFYPCdgX10hBvMcR"
#define ifttt_event "intruder_alert"

DHT dht(dhtpin, dhttype);
Ubidots client(token);
IFTTTWebhook ifttt_webhook(ifttt_api, ifttt_event);
int op=0;

void callback(char* topic, byte* payload, unsigned int length) {
    Serial.print("Message arrived [");
    Serial.print(topic);
    Serial.print("] ");
    for (int i = 0; i < length; i++) {
        Serial.print((char)payload[i]);
    }
    Serial.println();
    op=(char)payload[0]-48;
    if(op==8){
        Serial.print("Command: ");
        bool command = *payload - 48;
        Serial.println(command);
        digitalWrite(relay, !command);
    }
    else if(op==9){
        Serial.print("Command: ");
        bool command = 0;
        Serial.println(command);
        digitalWrite(relay, !command);
    }
    else{
        Serial.println("Command not for Relay");
    }
    Serial.print("op: ");
    Serial.println(op);
}

void setup() {

```

```

Serial.begin(9600);

Serial.println("Welcome to Home assistant.");

dht.begin();
pinMode(u_trigger, OUTPUT);
pinMode(u_echo, INPUT);
pinMode(relay, OUTPUT);
pinMode(mq_a, INPUT);

Serial.print("Connecting to SSID: ");
Serial.print(id);
Serial.print(", Password: ");
Serial.println(pass);
client.wifiConnection(id, pass);
Serial.println("Done");

Serial.println(" Initializing Ubidots Connection...");
client.ubidotsSetBroker("industrial.api.ubidots.com");
client.setDebug(true);
client.begin(callback);
client.ubidotsSubscribe("home-assistant", "relay");
client.ubidotsSubscribe("home-assistant", "option");
Serial.println("Done");
}

void dht_task1() {
    float h = dht.readHumidity();    // read humidity
    float t = dht.readTemperature(); // read temperature

    Serial.print("Temp.: ");
    Serial.print(t);    // print the temperature
    Serial.print((char)223); // print ° character
    Serial.println("C");

    Serial.print("Humidity: ");
    Serial.print(h);    // print the humidity
    Serial.println("%");

    if (!client.connected()) {
        client.reconnect();
    }
    client.add("t", t);
    client.add("h", h);
    client.ubidotsPublish("home-assistant");
    //client.loop();
    delay(1000);
}

```

```

void ultrasonic_task2(){
    digitalWrite (u_trigger, HIGH);
    delayMicroseconds (10);
    digitalWrite (u_trigger, LOW);
    int time = pulseIn (u_echo, HIGH);
    int distance = (time * 0.034) / 2;
    if (distance <= 20)
    {
        Serial.print (" Distance= ");
        Serial.println (distance);
        Serial.println("Intrusion Detected!");
        ifttt_webhook.trigger();
        delay(500);
    }
    if(!client.connected()){
        client.reconnect();
    }
    client.add("distance",distance);
    client.ubidotsPublish("home-assistant");
    client.loop();
    delay(1000);
}

void mq135_task3(){
    float ppm = analogRead(mq_a) / 4; // PPM
    Serial.print("Air Quality : ");
    Serial.print(ppm);
    Serial.println(" PPM");

    // Establising connection with Ubidots
    if (!client.connected()) {
        client.reconnect();
    }

    // Publising data of both variable to Ubidots
    client.add("ppm", ppm); // Insert your variable Labels and the
value to be sent
    client.ubidotsPublish("home-assistant"); // insert your device
label here
    client.loop();
    delay(1000);
}

void relay_task4(){
    if (!client.connected()) {
        client.reconnect();
        client.ubidotsSubscribe("home-assistant","relay");
    }
    client.loop();
    delay(1000);
}

```

```

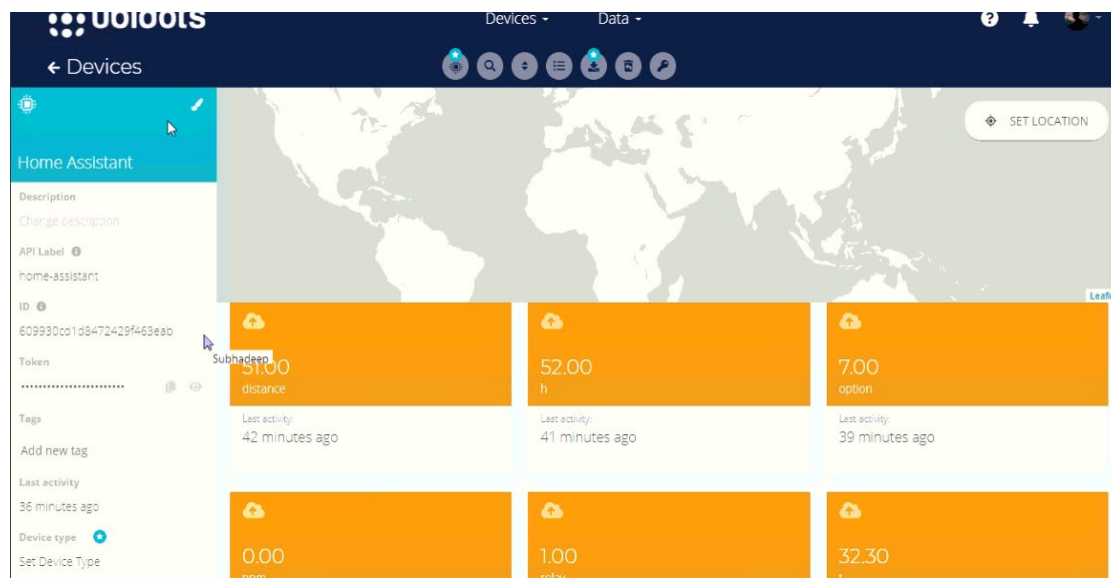
}

void loop() {
  if (!client.connected()) {
    client.reconnect();
    client.ubidotsSubscribe("home-assistant","option");
  }
  client.loop();
  delay(1000);

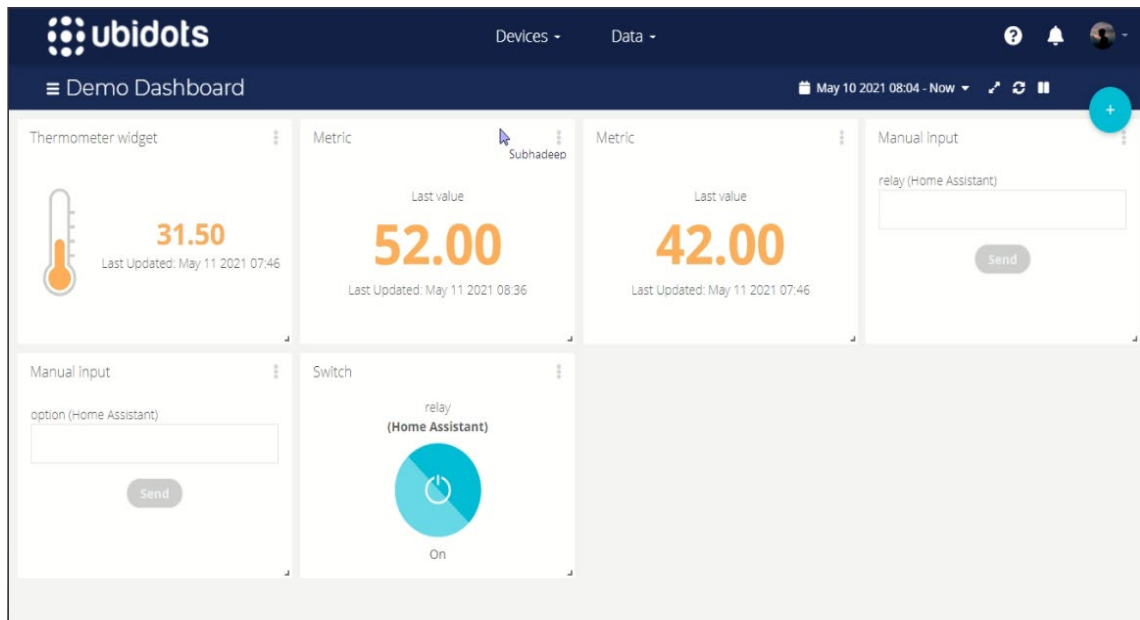
  if (op==5){
    dht_task1();
  }
  else if (op==6){
    ultrasonic_task2();
  }
  else if (op==7){
    mq135_task3();
  }
  else if (op==8 || op==9){
    relay_task4();
  }
}

```

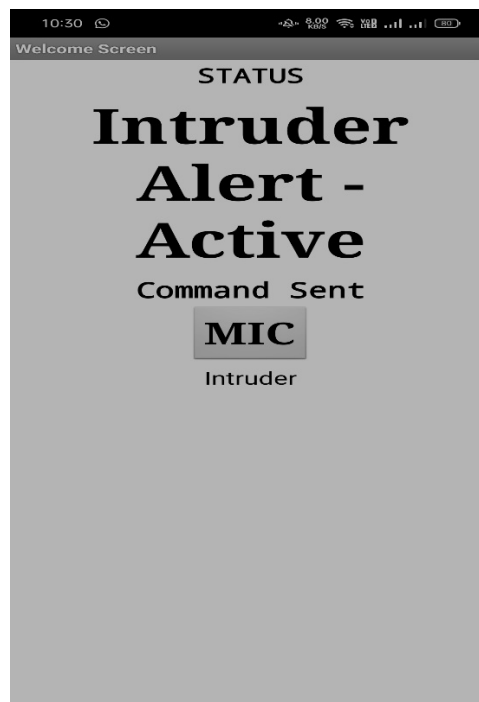
UBIDOTS:



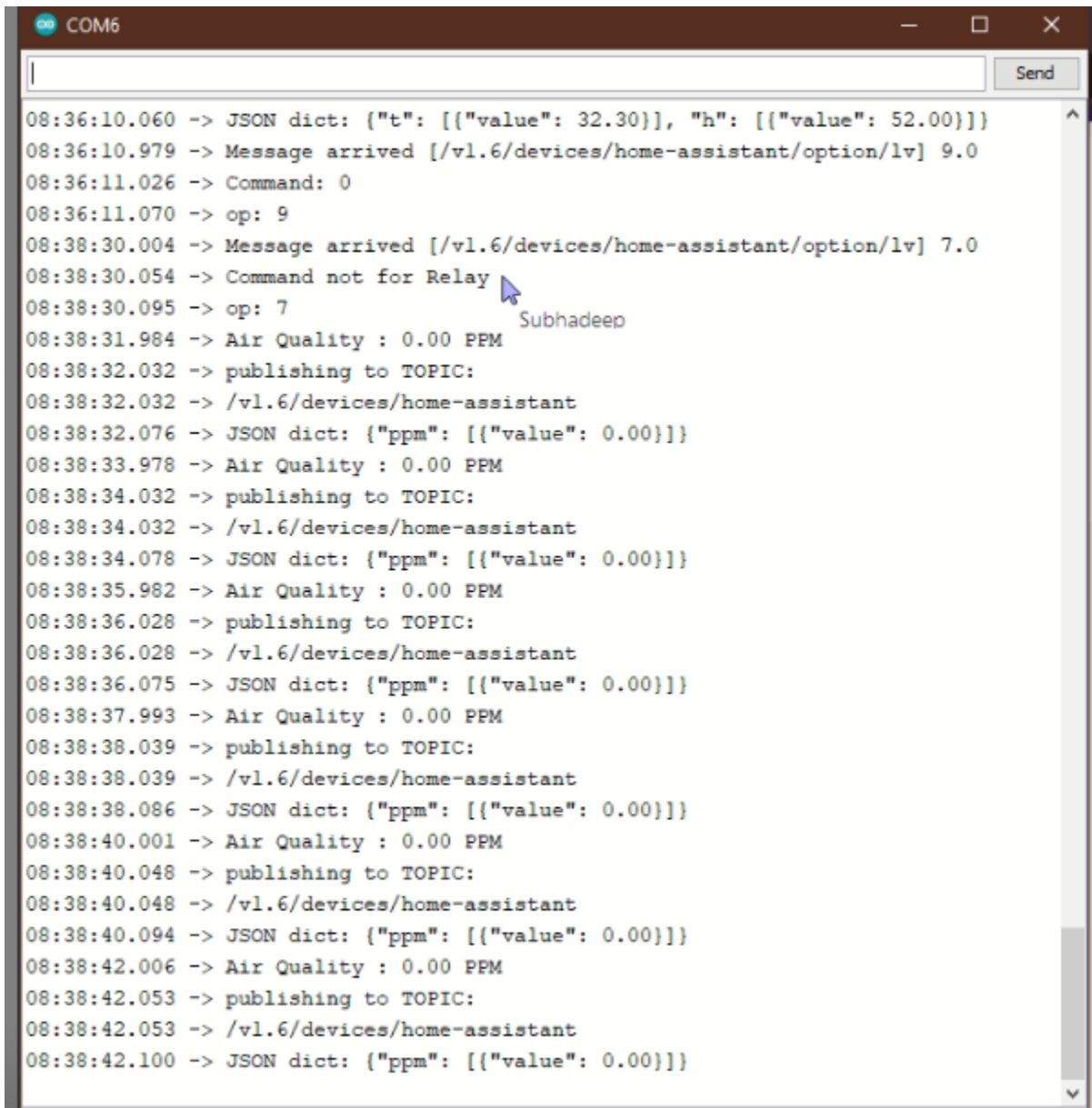
Dashboard:



App screenshot



Outcome:



```
COM6
08:36:10.060 -> JSON dict: {"t": [{"value": 32.30}], "h": [{"value": 52.00}]}
08:36:10.979 -> Message arrived [/v1.6/devices/home-assistant/option/lv] 9.0
08:36:11.026 -> Command: 0
08:36:11.070 -> op: 9
08:38:30.004 -> Message arrived [/v1.6/devices/home-assistant/option/lv] 7.0
08:38:30.054 -> Command not for Relay
08:38:30.095 -> op: 7
08:38:31.984 -> Air Quality : 0.00 PPM
08:38:32.032 -> publishing to TOPIC:
08:38:32.032 -> /v1.6/devices/home-assistant
08:38:32.076 -> JSON dict: {"ppm": [{"value": 0.00}]}
08:38:33.978 -> Air Quality : 0.00 PPM
08:38:34.032 -> publishing to TOPIC:
08:38:34.032 -> /v1.6/devices/home-assistant
08:38:34.078 -> JSON dict: {"ppm": [{"value": 0.00}]}
08:38:35.982 -> Air Quality : 0.00 PPM
08:38:36.028 -> publishing to TOPIC:
08:38:36.028 -> /v1.6/devices/home-assistant
08:38:36.075 -> JSON dict: {"ppm": [{"value": 0.00}]}
08:38:37.993 -> Air Quality : 0.00 PPM
08:38:38.039 -> publishing to TOPIC:
08:38:38.039 -> /v1.6/devices/home-assistant
08:38:38.086 -> JSON dict: {"ppm": [{"value": 0.00}]}
08:38:40.001 -> Air Quality : 0.00 PPM
08:38:40.048 -> publishing to TOPIC:
08:38:40.048 -> /v1.6/devices/home-assistant
08:38:40.094 -> JSON dict: {"ppm": [{"value": 0.00}]}
08:38:42.006 -> Air Quality : 0.00 PPM
08:38:42.053 -> publishing to TOPIC:
08:38:42.053 -> /v1.6/devices/home-assistant
08:38:42.100 -> JSON dict: {"ppm": [{"value": 0.00}]}
```

Brief explanation of the project:

In this project we have developed a home surveillance and maintenance system using 4 sensor types namely temperature and humidity sensor module to keep a check on any major temperature changes in home, also we have used ultrasonic sensor to check any intrusion in the home by giving an intrusion alert signal, we have also used gas sensor to check the air quality by measuring ppm of gas in the atmosphere. In addition to this we have used a relay to conduct remote operation on lighting of the house (here a bulb.). These features can be used for checking the security of the house.