Assignment -4

Assignment Date	25 October 2022
Student Name	Kalaivani M
Student Roll Number	910419104008
Maximum Marks	2 Marks

Smart Waste Management system in metropolitan cities

Question-1:

Write code and connections in wokwi for ultrasonic sensors. Whenever distance is less than 100 cms send alert to ibm cloud & display in device recent events. Upload document with wokwi share link and images of ibm colud.

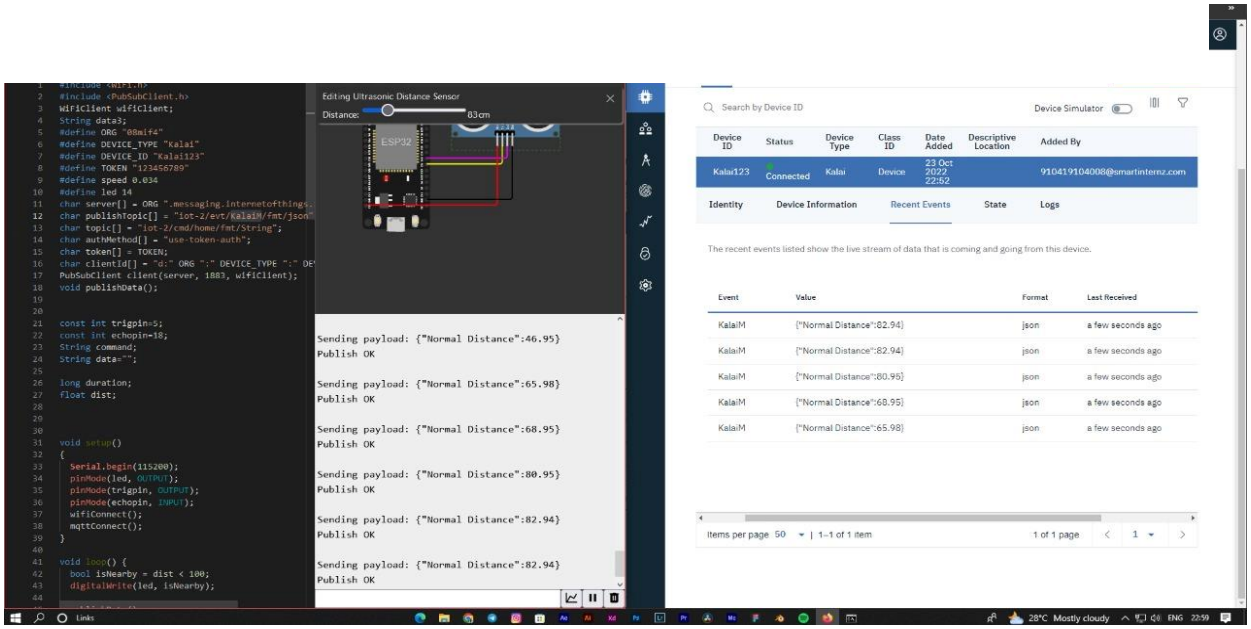
Solution:

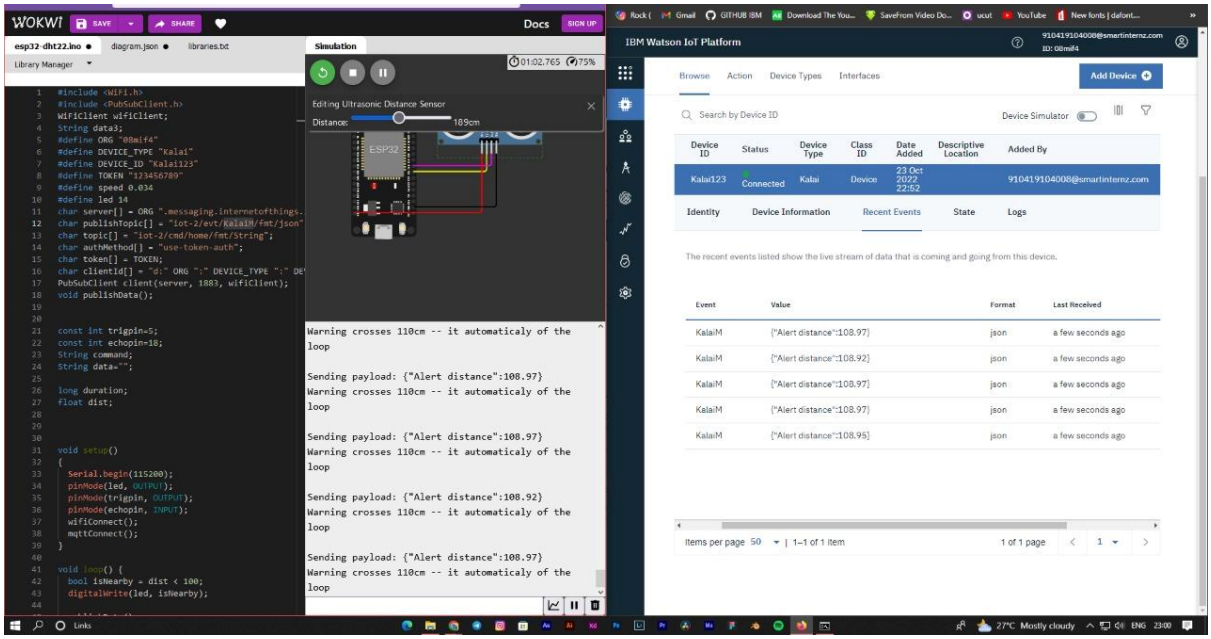
```
#include <WiFi.h>
#include <PubSubClient.h>
WiFiClient wifiClient;
String data3;
#define ORG "08mif4"
#define DEVICE_TYPE "Kalai"
#define DEVICE_ID "Kalai123"
#define TOKEN "123456789"
#define speed 0.034
#define led 14
char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
char publishTopic[] = "iot-2/evt/KalaiM/fmt/json";
char topic[] = "iot-2/cmd/home/fmt/String";
char authMethod[] = "use-token-auth";
char token[] = TOKEN;
char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;
PubSubClient client(server, 1883, wifiClient);
void publishData();


const int trigpin=5;
const int echopin=18;
String command;
String data="";

long duration;
float dist;



void setup()
{
```

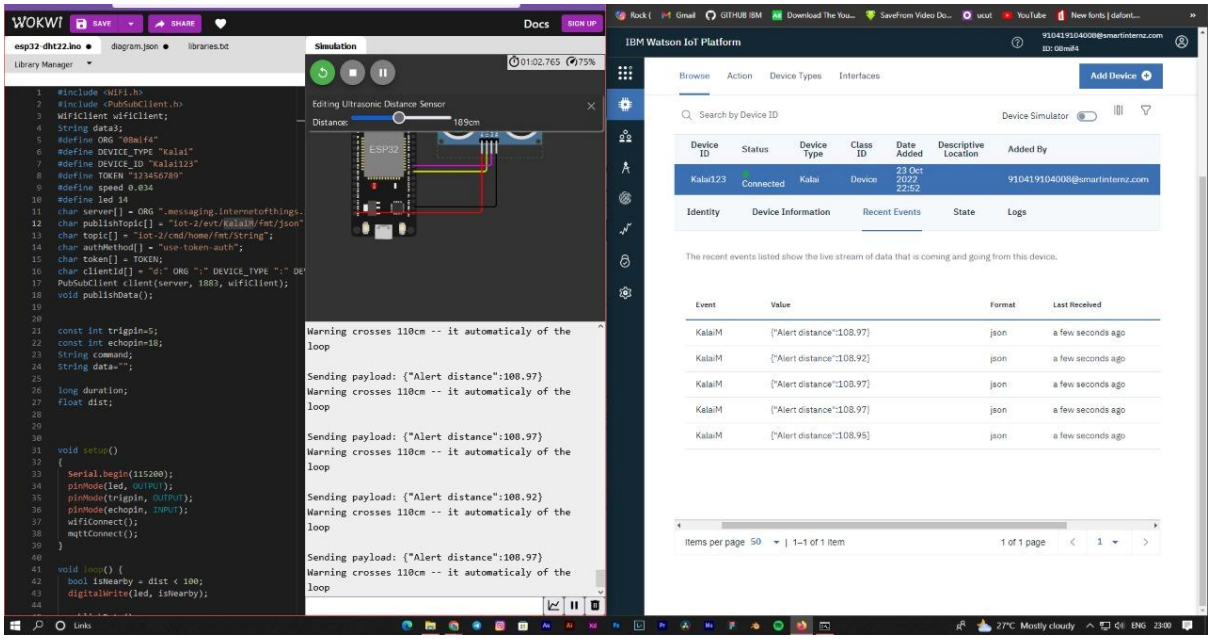
```
  Serial.begin(115200);
  pinMode(led, OUTPUT);
  pinMode(trigpin, OUTPUT);
  pinMode(echopin, INPUT);
  wifiConnect();
  mqttConnect();
}

void loop() {
  bool isNearby = dist < 100;
  digitalWrite(led, isNearby);

  publishData();
  delay(500);

  if (!client.loop()) {
    mqttConnect();
  }
}

void wifiConnect() {
  Serial.print("Connecting to "); Serial.print("Wifi");
  WiFi.begin("Wokwi-GUEST", "", 6);
  while (WiFi.status() != WL_CONNECTED) {
    delay(500);
    Serial.print(".");
  }
  Serial.print("WiFi connected, IP address: ");
Serial.println(WiFi.localIP());
}

void mqttConnect() {
  if (!client.connected()) {
    Serial.print("Reconnecting MQTT client to ");
Serial.println(server);
    while (!client.connect(clientId, authMethod, token)) {
      Serial.print(".");
      delay(500);
    }
    initManagedDevice();
    Serial.println();
  }
}

void initManagedDevice() {
  if (client.subscribe(topic)) {
    // Serial.println(client.subscribe(topic));
    Serial.println("IBM subscribe to cmd OK");
```

```
  } else {
    Serial.println("subscribe to cmd FAILED");
  }
}
void publishData()
{
  digitalWrite(trigpin,LOW);
  digitalWrite(trigpin,HIGH);
  delayMicroseconds(10);
  digitalWrite(trigpin,LOW);
  duration=pulseIn(echopin,HIGH);
  dist=duration*speed/2;
  if(dist<100){
    String payload = "{\"Normal Distance\":";
    payload += dist;
    payload += "}";

    Serial.print("\n");
    Serial.print("Sending payload: ");
    Serial.println(payload);
    if (client.publish(publishTopic, (char*) payload.c_str())) {
      Serial.println("Publish OK");
    }

  }
    if(dist>101 && dist<111){
    String payload = "{\"Alert distance\":";
    payload += dist;
    payload += "}";

    Serial.print("\n");
    Serial.print("Sending payload: ");
    Serial.println(payload);
     if(client.publish(publishTopic, (char*) payload.c_str())) {
      Serial.println("Warning crosses 110cm -- it automaticaly of
the loop");
      digitalWrite(led,HIGH);
    }else {
      Serial.println("Publish FAILED");
    }

  }


  }
```

Output :


Editing Ultrasonic Distance Sensor
Distance:
63cm
ESP32
Sending payload: {"Normal Distance":46.95}
Publish OK
Sending payload: {"Normal Distance":65.98}
Publish OK
Sending payload: {"Normal Distance":68.95}
Publish OK
Sending payload: {"Normal Distance":80.95}
Publish OK
Sending payload: {"Normal Distance":82.94}
Publish OK
Sending payload: {"Normal Distance":82.94}
Publish OK
Search by Device ID
Device Simulator
Device ID
Status
Device Type
Class ID
Date Added
Descriptive Location
Added By
Kalai123
Connected
Kalai
Device
23 Oct 2022 22:52
910419104008@smartinternz.com
Identity
Device Information
Recent Events
State
Logs
The recent events listed show the live stream of data that is coming and going from this device.
Event
Value
Format
Last Received
KalaiM
{"Normal Distance":82.94}
{"Normal Distance":82.94}
{"Normal Distance":80.95}
{"Normal Distance":68.95}
{"Normal Distance":65.98}
json
a few seconds ago
Items per page 50
1–1 of 1 item
1 of 1 page


WOKWI
SAVE
SHARE
Docs
SIGN UP
esp32-dht22.ino
diagram.json
libraries.txt
Library Manager
Simulation
01:02.765
75%
Editing Ultrasonic Distance Sensor
Distance:
189cm
ESP32
Warning crosses 110cm -- it automaticaly of the loop
Sending payload: {"Alert distance":108.97}
Warning crosses 110cm -- it automaticaly of the loop
Sending payload: {"Alert distance":108.97}
Warning crosses 110cm -- it automaticaly of the loop
Sending payload: {"Alert distance":108.92}
Warning crosses 110cm -- it automaticaly of the loop
Sending payload: {"Alert distance":108.97}
Warning crosses 110cm -- it automaticaly of the loop
IBM Watson IoT Platform
Browse
Action
Device Types
Interfaces
Add Device
Search by Device ID
Device Simulator
Device ID
Status
Device Type
Class ID
Date Added
Descriptive Location
Added By
Kalai123
Connected
Kalai
Device
23 Oct 2022 22:52
910419104008@smartinternz.com
Identity
Device Information
Recent Events
State
Logs
The recent events listed show the live stream of data that is coming and going from this device.
Event
Value
Format
Last Received
KalaiM
{"Alert distance":108.97}
{"Alert distance":108.92}
{"Alert distance":108.97}
{"Alert distance":108.97}
{"Alert distance":108.95}
json
a few seconds ago
Items per page 50
1–1 of 1 item
1 of 1 page


WOKWI
SAVE
SHARE
Docs
SIGN UP
esp32-dht22.ino
diagram.json
libraries.txt
Library Manager
Simulation
Editing Ultrasonic Distance Sensor
Distance:
189cm
ESP32
#include <WiFi.h>
#include <PubSubClient.h>
WiFiClient wifiClient;
String data3;
#define ORG "08mif4"
#define DEVICE_TYPE "Kalai"
#define DEVICE_ID "kalai123"
#define TOKEN "12345678"
#define speed 0.034
#define led 14
char server[] = ORG ".messaging.internetofthings.
char publishTopic[] = "iot-2/evt/KalaiM/fmt/json"
char topic[] = "iot-2/cmd/home/fmt/String";
char authMethod[] = "use-token-auth";
char token[] = TOKEN;
char clientId[] = "d:" ORG ":" DEVICE_TYPE ":"
PubSubClient client(server, 1883, wifiClient);
void publishData();
const int trigpin=5;
const int echopin=18;
String command;
String data="";
long duration;
float dist;
void setup()
{
Serial.begin(115200);
pinMode(led, OUTPUT);
pinMode(trigpin, OUTPUT);
pinMode(echopin, INPUT);
wifiConnect();
mqttConnect();
}
void loop() {
bool isNearby = dist < 100;
digitalWrite(led, isNearby);
Warning crosses 110cm -- it automaticaly of the loop
Sending payload: {"Alert distance":108.97}
Warning crosses 110cm -- it automaticaly of the loop
Sending payload: {"Alert distance":108.97}
Warning crosses 110cm -- it automaticaly of the loop
Sending payload: {"Alert distance":108.92}
Warning crosses 110cm -- it automaticaly of the loop
Sending payload: {"Alert distance":108.97}
Warning crosses 110cm -- it automaticaly of the loop
IBM Watson IoT Platform
Browse
Action
Device Types
Interfaces
Add Device
Search by Device ID
Device Simulator
Device ID
Status
Device Type
Class ID
Date Added
Descriptive Location
Added By
Kalai123
Connected
Kalai
Device
23 Oct 2022 22:02
Identity
Device Information
Recent Events
State
Logs
The recent events listed show the live stream of data that is coming and going from this device.
Event
Value
Format
Last Received
KalaiM
{"Alert distance":108.97}
json
a few seconds ago
KalaiM
{"Alert distance":108.92}
json
a few seconds ago
KalaiM
{"Alert distance":108.97}
json
a few seconds ago
KalaiM
{"Alert distance":108.97}
json
a few seconds ago
KalaiM
{"Alert distance":108.95}
json
a few seconds ago
Items per page 50
1–1 of 1 item
1 of 1 page
27°C Mostly cloudy
ENG
23:00