Assignment -4

Distance Detection Using Ultrasonic Sensor

Assignment Date	15 October 2022
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Maximum Marks	2 Marks

Question-1:

Write code and connections in wokwi for the ultrasonic sensor.

Whenever the distance is less than 100 cms send an "alert" to the IBM cloud and display in the device recent events.

Upload document with wokwi share link and images of IBM cloud

WOKWI LINK

https://wokwi.com/projects/346781721885147732/

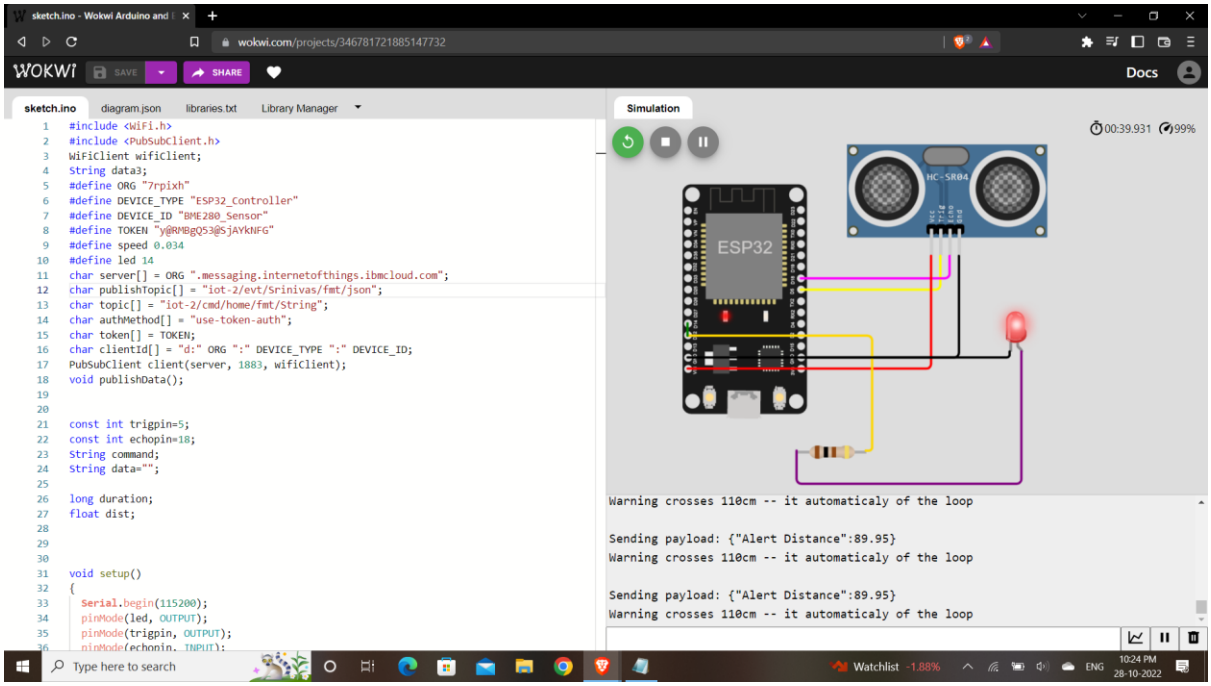
Solution:

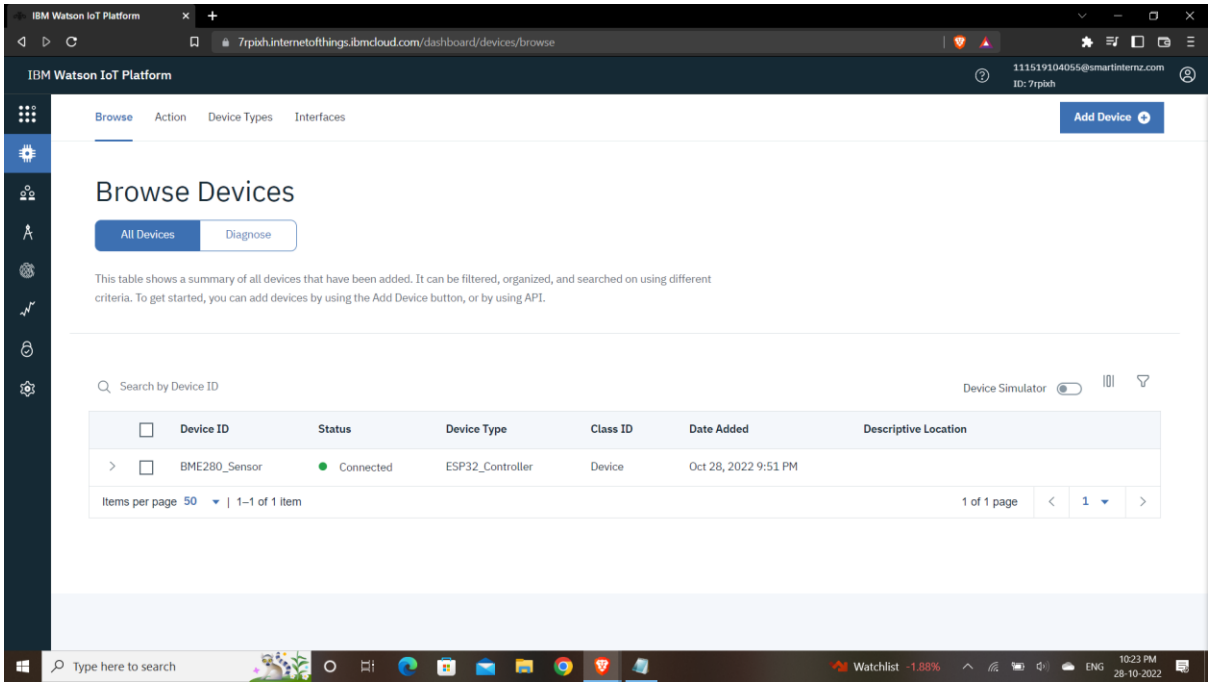
```
#include <WiFi.h>

#include <PubSubClient.h>
WiFiClient wifiClient;
String data3;
#define ORG "7rpixh"
#define DEVICE_TYPE "ESP32_Controller"
#define DEVICE_ID "BME280_Sensor"
#define TOKEN "y@RMBgQ53@SjAYkNFG"
#define speed 0.034
#define led 14
char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
char publishTopic[] = "iot-2/evt/Srinivas/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;
```

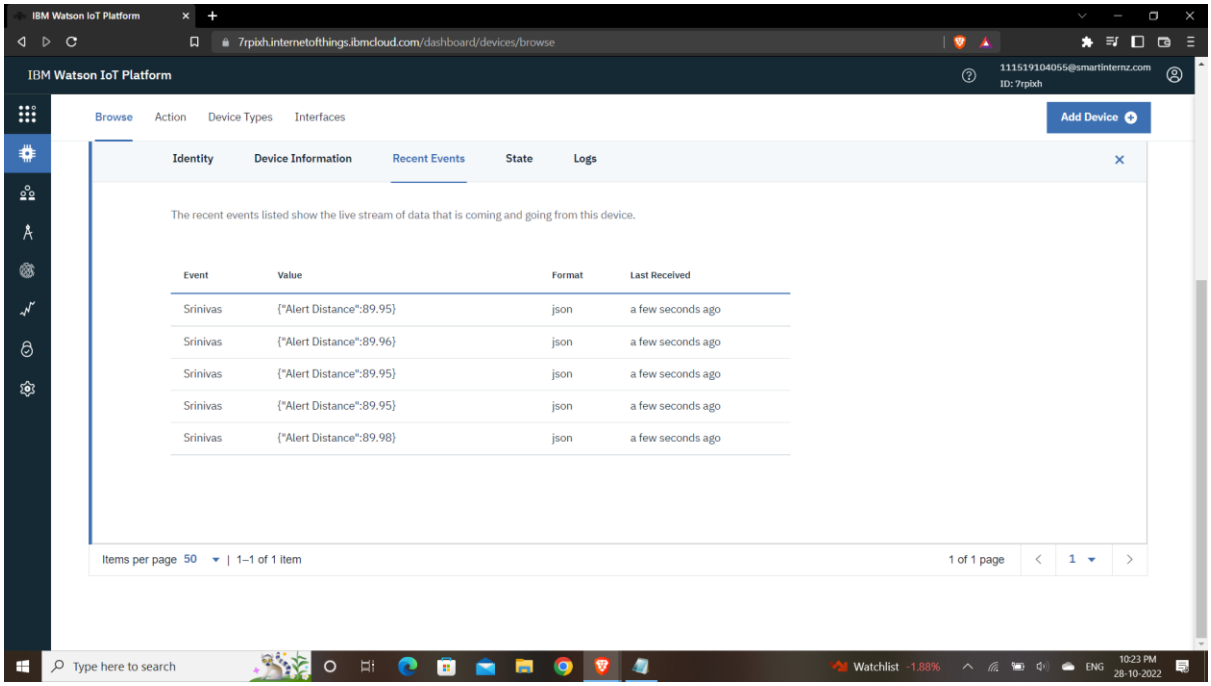
```
void setup()
{
  Serial.begin(115200);
  pinMode(led, OUTPUT);
  pinMode(trigpin, OUTPUT);
  pinMode(echopin, INPUT);
  wifiConnect();
  mqttConnect();
}

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 = "{\"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);
    }

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

    Serial.print("\n");
    Serial.print("Sending payload: ");
    Serial.println(payload);

    }

  }



  void callback(char* subscribeTopic, byte* payload, unsigned int
payloadLength){
```

```
    Serial.print("callback invoked for topic:");
    Serial.println(subscribeTopic);
    for(int i=0; i<payloadLength; i++){
      dist += (char)payload[i];
    }
    Serial.println("data:"+ data3);
    if(data3=="lighton"){
      Serial.println(data3);
      digitalWrite(led,HIGH);
    }
    data3="";
  }
```




IBM Watson IoT Platform
7rpixh.internetofthings.ibmcloud.com/dashboard/devices/browse
IBM Watson IoT Platform
111519104055@smartinternz.com
ID: 7rpixh
Browse
Action
Device Types
Interfaces
Add Device
Browse Devices
All Devices
Diagnose
This table shows a summary of all devices that have been added. It can be filtered, organized, and searched on using different criteria. To get started, you can add devices by using the Add Device button, or by using API.
Search by Device ID
Device Simulator
Device ID
Status
Device Type
Class ID
Date Added
Descriptive Location
BME280_Sensor
Connected
ESP32_Controller
Device
Oct 28, 2022 9:51 PM
Items per page 50
1–1 of 1 item
1 of 1 page
1
Type here to search
Watchlist -1.88%
ENG
10:23 PM
28-10-2022


IBM Watson IoT Platform
7rpixh.internetofthings.ibmcloud.com/dashboard/devices/browse
IBM Watson IoT Platform
111519104055@smartinternz.com
ID: 7rpixh
Browse
Action
Device Types
Interfaces
Add Device
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
Srinivas
{"Alert Distance":89.95}
json
a few seconds ago
Srinivas
{"Alert Distance":89.96}
json
a few seconds ago
Srinivas
{"Alert Distance":89.95}
json
a few seconds ago
Srinivas
{"Alert Distance":89.95}
json
a few seconds ago
Srinivas
{"Alert Distance":89.98}
json
a few seconds ago
Items per page 50
1–1 of 1 item
1 of 1 page
1
Type here to search
Watchlist -1.88%
ENG
10:23 PM
28-10-2022