Assignment -4

ESP32 Programming with IBM Cloud

Assignment Date	29 October 2022
Student Name	ABIMANYU M
Student Roll Number	820419106002
Maximum Marks	2 Marks

Question-1:

Write code and connections in wokwi for ultrasonic sensor. Whenever distance is less than 100cmssend “alert” to ibm cloud and display in device recent events.

Upload document with wokwi share link and images of ibm cloud.

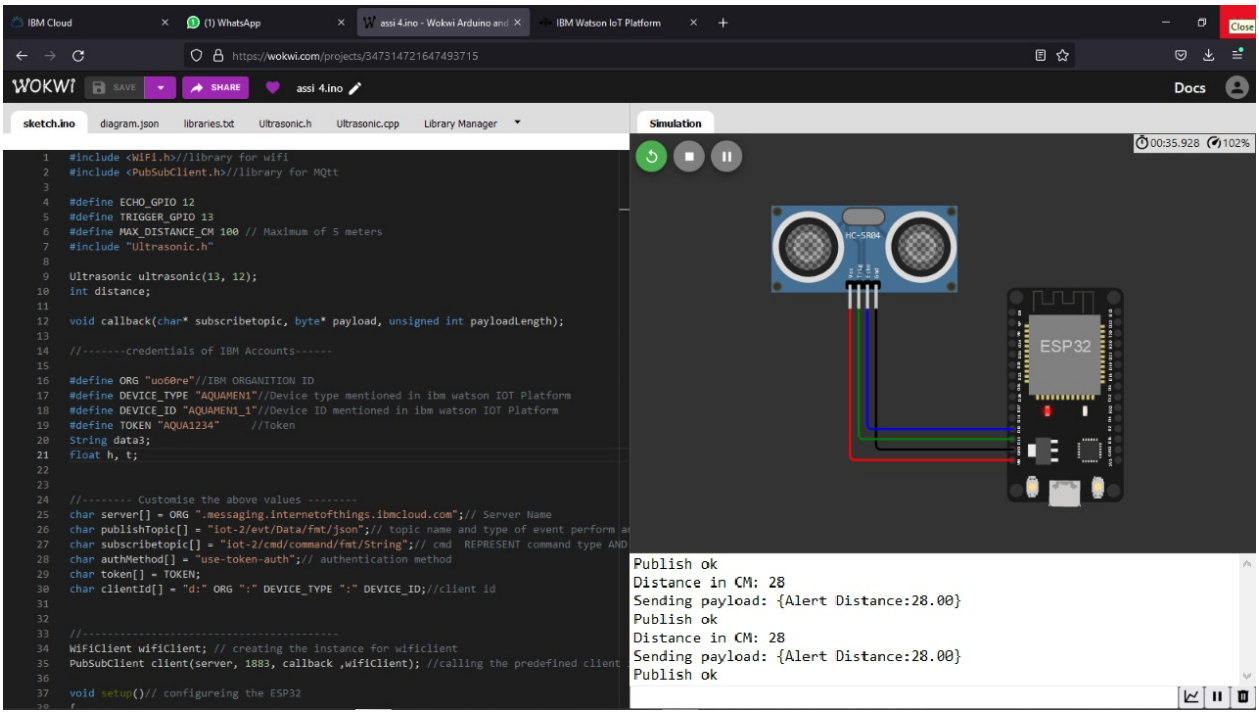
Solution:

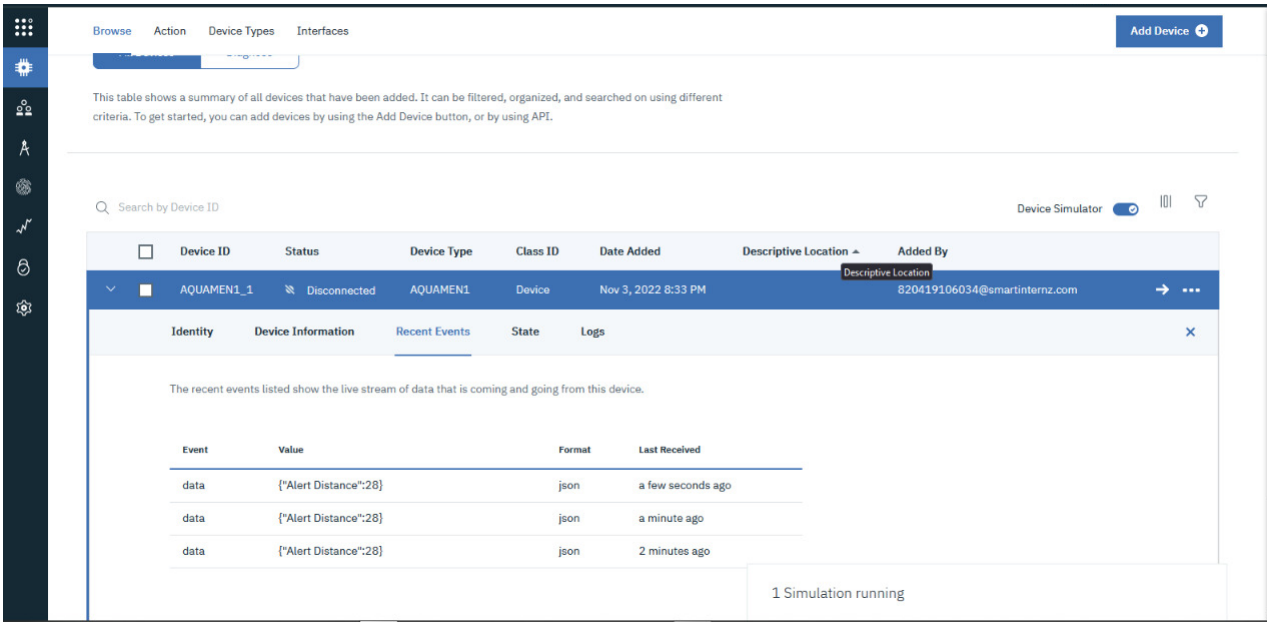
```
#include <WiFi.h>//library for wifi
#include <PubSubClient.h>//library for MQtt

#define ECHO_GPIO 12
#define TRIGGER_GPIO 13
#define MAX_DISTANCE_CM 100 // Maximum of 5 meters
#include "Ultrasonic.h"

Ultrasonic ultrasonic(13, 12);
int distance;

void callback(char* subscribetopic, byte* payload, unsigned int payloadLength);

//-------credentials of IBM Accounts------

#define ORG "uo60re"//IBM ORGANITION ID
#define DEVICE_TYPE "AQUAMEN1"//Device type mentioned in ibm watson IOT Platform
#define DEVICE_ID "AQUAMEN1_1"//Device ID mentioned in ibm watson IOT Platform
#define TOKEN "AQUA1234"     //Token
String data3;
float h, t;


//-------- Customise the above values --------
char server[] = ORG ".messaging.internetofthings.ibmcloud.com";// Server Name
char publishTopic[] = "iot-2/evt/Data/fmt/json";// topic name and type of event perform and format in which data to be send
char subscribetopic[] = "iot-2/cmd/command/fmt/String";// cmd  REPRESENT command type AND COMMAND IS TEST OF FORMAT STRING
char authMethod[] = "use-token-auth";// authentication method
char token[] = TOKEN;
char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;//client id


//-------------------------------------
WiFiClient wifiClient; // creating the instance for wificlient
```

```
PubSubClient client(server, 1883, callback ,wifiClient); //calling the predefined client id by passing parameter like server id,portand wificredential

void setup()// configureing the ESP32
{
  Serial.begin(115200);
  delay(10);
  Serial.println();
  wificonnect();
  mqttconnect();
}

void loop()// Recursive Function
{

  distance = ultrasonic.read(CM);
  if(distance < 100){
  Serial.print("Distance in CM: ");
  Serial.println(distance);
  PublishData(distance);
  delay(1000);
  if (!client.loop()) {
    mqttconnect();
  }

  }

  delay(1000);


}

/*.....retrieving to Cloud.....*/

void PublishData(float temp) {
  mqttconnect();//function call for connecting to ibm
  /*
     creating the String in in form JSon to update the data to ibm cloud
  */
  String payload = "{\"Alert Distance:\":";
  payload += temp;
  payload += "}";


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


  if (client.publish(publishTopic, (char*) payload.c_str())) {
    Serial.println("Publish ok");// if it sucessfully upload data on the cloud then it will print publish ok in Serial monitor or else it will print publish failed
  } else {
    Serial.println("Publish failed");
```

```
  }

}

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

     initManagedDevice();
     Serial.println();
  }
}
void wificonnect() //function defination for wificonnect
{
  Serial.println();
  Serial.print("Connecting to ");

  WiFi.begin("Wokwi-GUEST", "", 6);//passing the wifi credentials to establish the connection
  while (WiFi.status() != WL_CONNECTED) {
    delay(500);
    Serial.print(".");
  }
  Serial.println("");
  Serial.println("WiFi connected");
  Serial.println("IP address: ");
  Serial.println(WiFi.localIP());
}

void initManagedDevice() {
  if (client.subscribe(subscribetopic)) {
    Serial.println((subscribetopic));
    Serial.println("subscribe to cmd OK");
  } else {
    Serial.println("subscribe to cmd FAILED");
  }
}

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++) {
    //Serial.print((char)payload[i]);
    data3 += (char)payload[i];
  }
  Serial.println("data: "+ data3);
  if(data3=="lighton")
```

```
 {
Serial.println(data3);
 }
 else
 {
Serial.println(data3);
 }
data3="";
}
```





Wokwi share link:

https://wokwi.com/projects/347322997381530195