Assignment-4

Assignment date	24th October,2022
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Roll Number	2019504050
Maximum marks	2 Marks

Question:

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

Code:

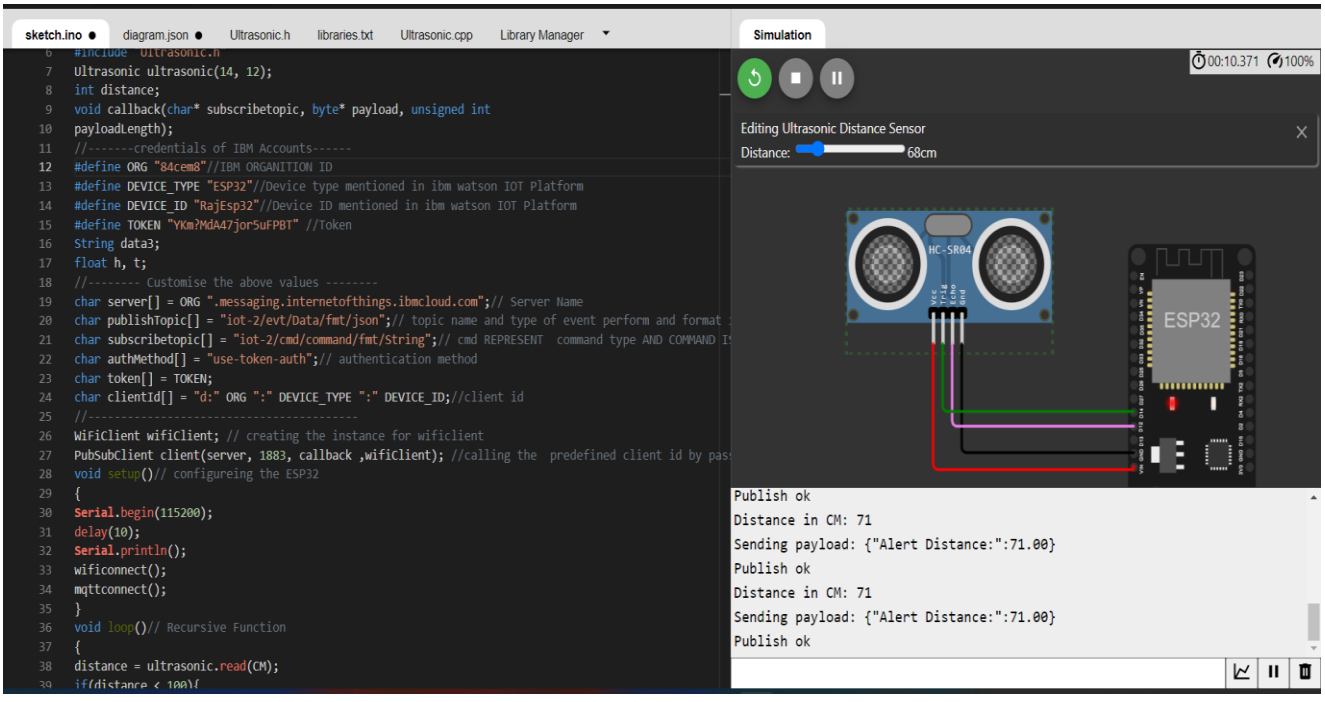
```
#include <WiFi.h>//library for wifi
#include <PubSubClient.h>//library for MQtt

#define ECHO_GPIO 12
#define TRIGGER_GPIO 14
#define MAX_DISTANCE_CM 100 // Maximum of 5 meters
#include "Ultrasonic.h"
Ultrasonic ultrasonic(14, 12);
int distance;

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

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

#define ORG "84cem8"//IBM ORGANITION ID
#define DEVICE_TYPE "ESP32"//Device type mentioned in ibm watson IOT
Platform#define DEVICE_ID “RajEsp32"//Device ID mentioned in ibm watson IOT
Platform#define TOKEN "YKm?MdA47jor5uFPBT" //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
```

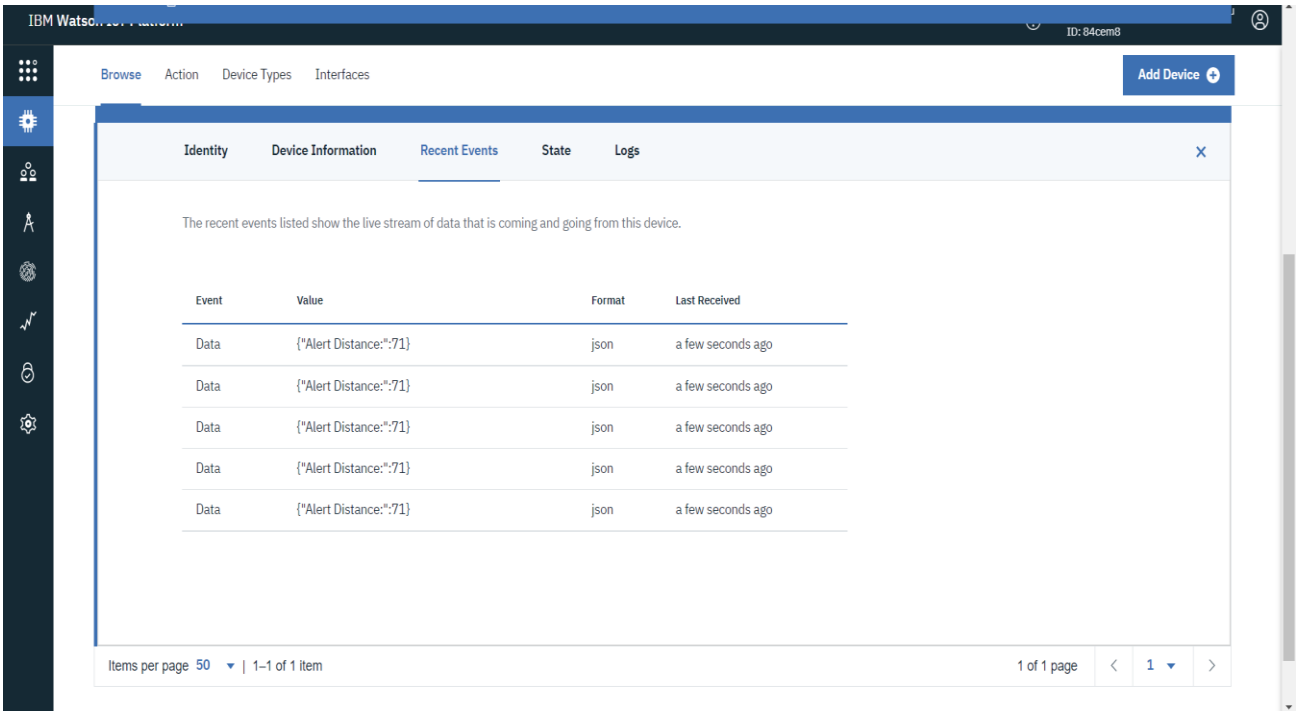
```
//-------------------------------------------
WiFiClient wifiClient; // creating the instance for wificlient
PubSubClient client(server, 1883, callback ,wifiClient); //calling the
predefined client id by passing parameter like server id,portand
wificredential

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 += "}";
```

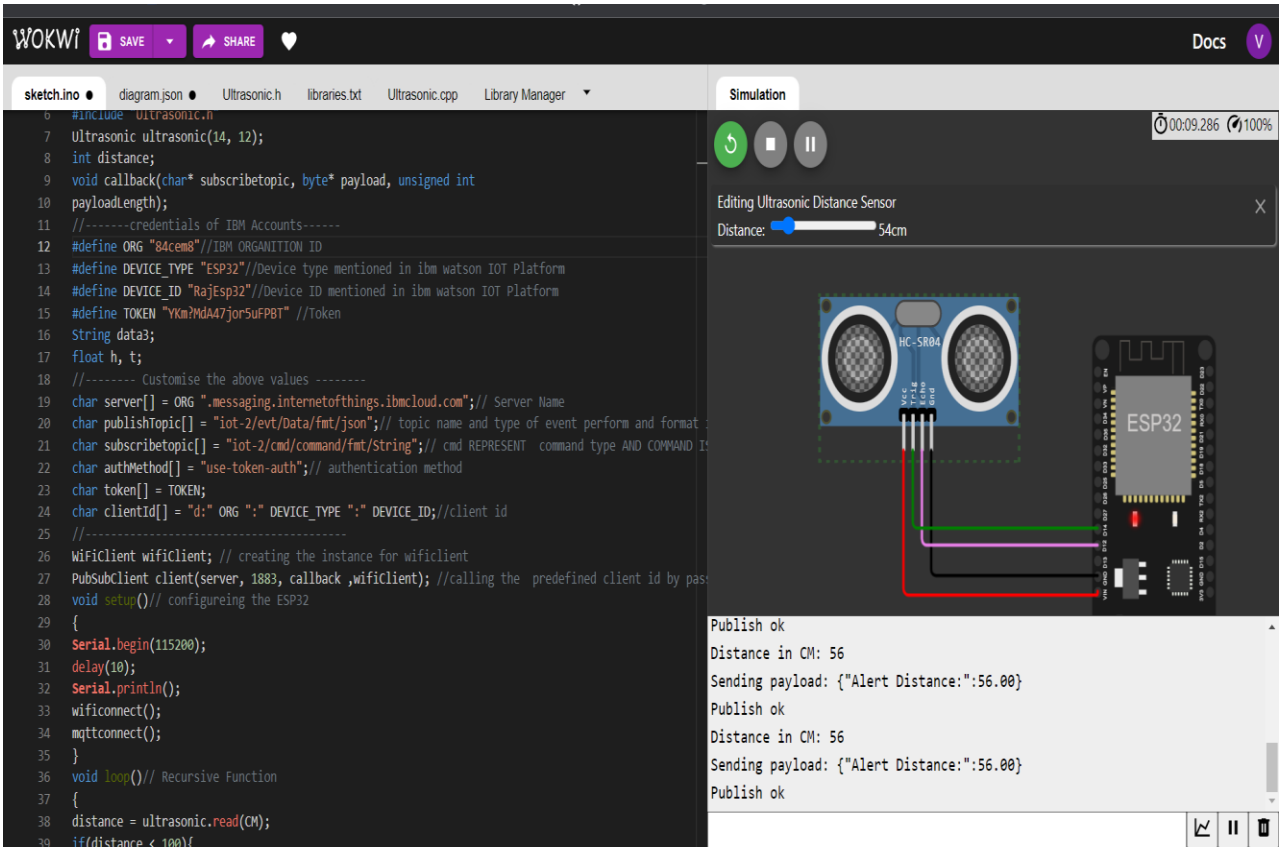
```
  Serial.print("Sending payload: ");
  Serial.println(payload);


  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");
```

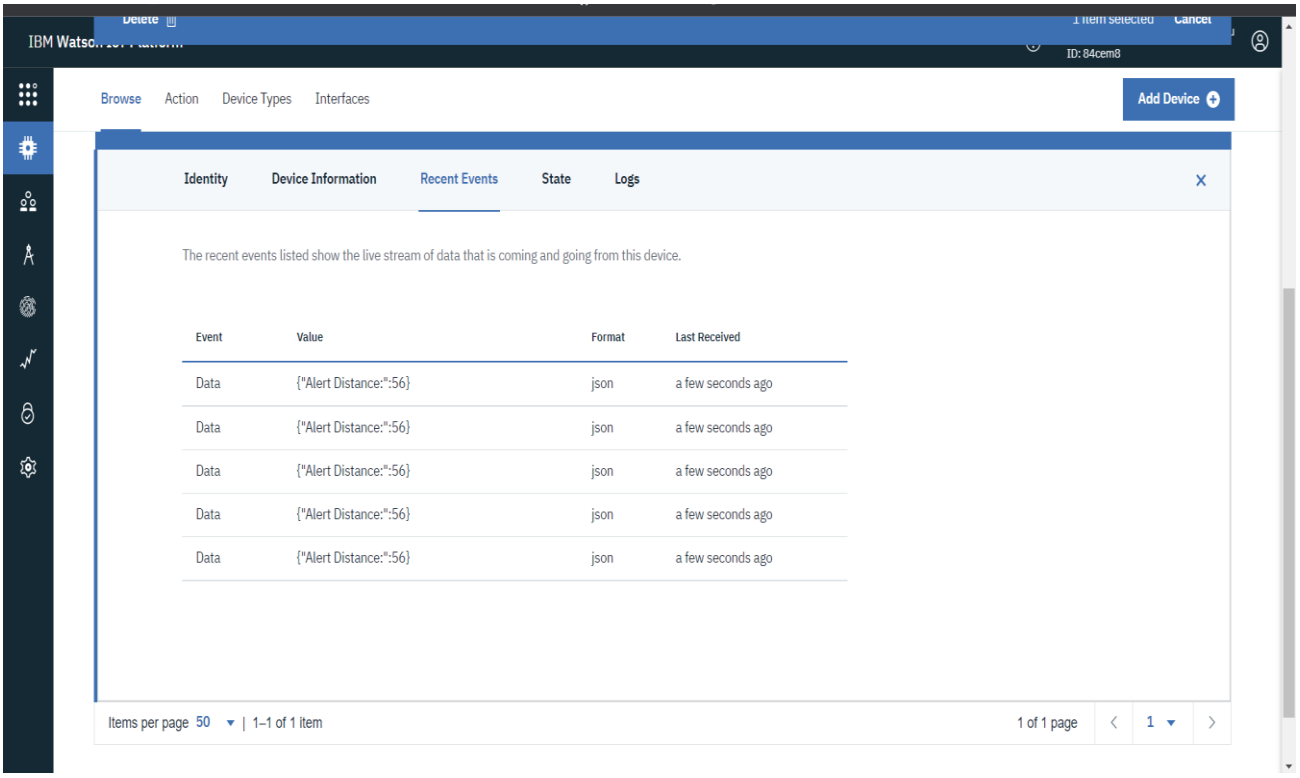
```
  } else {
    Serial.println("subscribe to cmd FAILED");
  }
}

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

Output:




ID: 84cem8
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
Data
{"Alert Distance:":71}
json
a few seconds ago
Items per page 50
1–1 of 1 item
1 of 1 page


WOKWi
SAVE
SHARE
Docs
sketch.ino
diagram.json
Ultrasonic.h
libraries.txt
Ultrasonic.cpp
Library Manager
Simulation
00:09.286
100%
Editing Ultrasonic Distance Sensor
Distance:
54cm
HC-SR04
ESP32
Publish ok
Distance in CM: 56
Sending payload: {"Alert Distance:":56.00}
Publish ok
Distance in CM: 56
Sending payload: {"Alert Distance:":56.00}
Publish ok



Project Link:

https://wokwi.com/projects/346964753156932179