Assignment -4

Assignment Date	02 November 2022
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Question:

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.

Code:

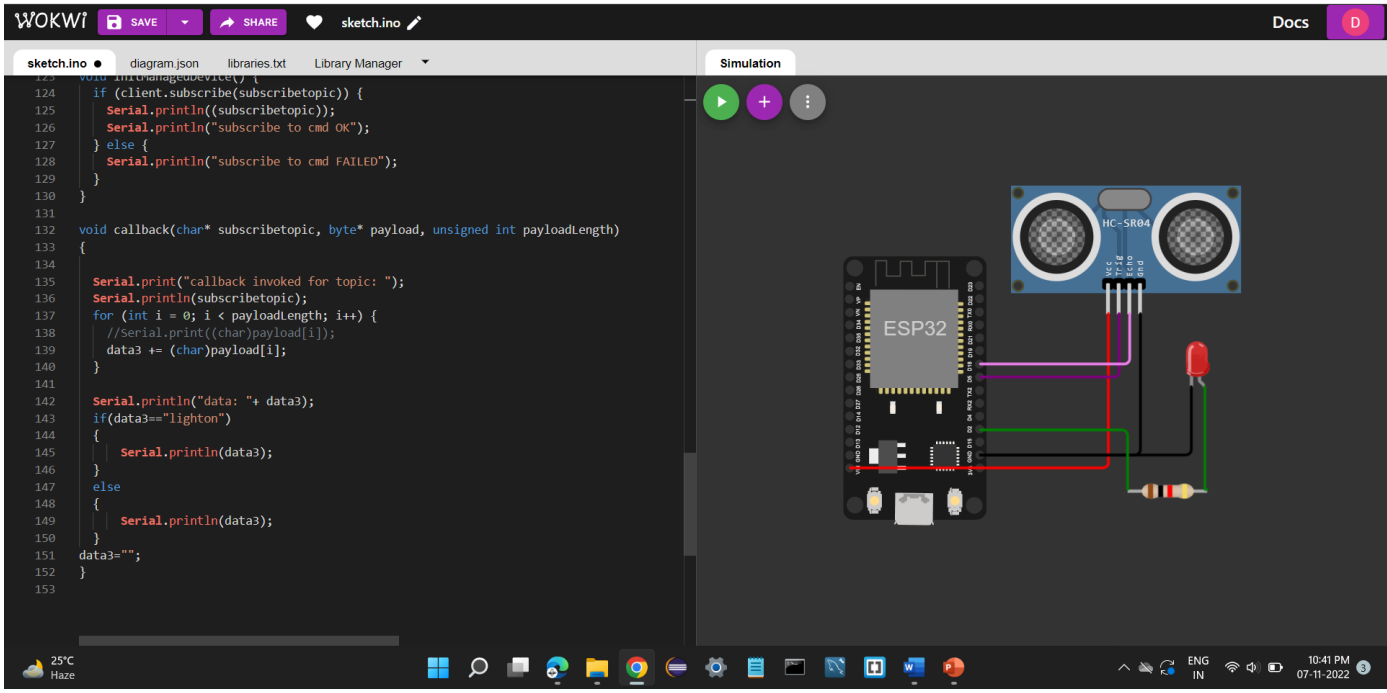
```
#include <WiFi.h>//library for wifi
#include <PubSubClient.h>//library for MQtt

void callback(char* subscribetopic, byte* payload, unsigned int payloadLength);
\
//-------credentials of IBM Accounts------

#define ORG "7kb3es"//IBM ORGANITION ID
#define DEVICE_TYPE "S1"//Device type mentioned in ibm watson IOT Platform
#define DEVICE_ID "636903"//Device ID mentioned in ibm watson IOT Platform
#define TOKEN "987654321"     //Token
String data3;



//-------- 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/test/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
const int trigpin = 5;
const int echopin = 18;
const int ledpin = 2;


long duration ;
float distance;
#define sound_speed 0.034
void setup() {
  // put your setup code here, to run once:
```

```
  Serial.begin(115200);
  pinMode(trigpin, OUTPUT);
  pinMode(echopin, OUTPUT);
  pinMode(ledpin, OUTPUT);
  wificonnect();
  mqttconnect();
}

void loop() {
  digitalWrite(trigpin, LOW);
  digitalWrite(trigpin, HIGH);
  delayMicroseconds(10);
  digitalWrite(trigpin, LOW);

  duration= pulseIn(echopin,HIGH);
  distance = duration * sound_speed /2;
  if(distance<=100){
    PublishData(distance);
  delay(1000);
  if (!client.loop()) {
    mqttconnect();
  }
    digitalWrite(ledpin, HIGH);
    Serial.println("ALERT....!!!");
    Serial.println(distance);
  }
  else
  {
    digitalWrite(ledpin, LOW);
  }
  // put your main code here, to run repeatedly:
  delay(10); // this speeds up the simulation
}

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

void PublishData(float distance) {
  mqttconnect();//function call for connecting to ibm

    // creating the String in in form JSon to update the data to ibm cloud
  String payload = "{\"ALERT...!!  \": ";
  payload += distance;
  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 Output:



IBM Cloud Alert:

Event	Value	Format	Last Received
Data	{"Distance (cm)":99.98}	json	a few seconds ago
Data	{"Distance (cm)":99.96}	json	a few seconds ago
Data	{"Distance (cm)":99.98}	json	a few seconds ago
Data	{"Distance (cm)":99.98}	json	a few seconds ago
Data	{"Distance (cm)":99.98}	json	a few seconds ago

Wokwi Share Link:

https://wokwi.com/projects/347688957062939218