Assignment -4

Data Pulish to IOT Device

Assignment Date	28 October 2022
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Maximum Marks	2 Marks

Question-1:

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

Solution:

```
#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 "17rb95"//IBM ORGANITION ID

#define DEVICE_TYPE "weather_device"//Device type mentioned in ibm watson IOT Platform

#define DEVICE_ID "weather_today"//Device ID mentioned in ibm watson IOT Platform

#define TOKEN "?4I@aqIzKhwuD(C6Om"     //Token

String data3;

float dist;


//-------- 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


int LED = 4;
int trig = 5;
int echo = 18;
void setup()
{
Serial.begin(115200);
pinMode(trig,OUTPUT);
pinMode(echo,INPUT);
pinMode(LED, OUTPUT);
delay(10);
wificonnect();
mqttconnect();
}
void loop()// Recursive Function
{
 digitalWrite(trig,LOW);
  digitalWrite(trig,HIGH);
  delayMicroseconds(10);
  digitalWrite(trig,LOW);
  float dur = pulseIn(echo,HIGH);
  float dist = (dur * 0.0343)/2;
  Serial.print ("Distancein cm");
  Serial.println(dist);
```

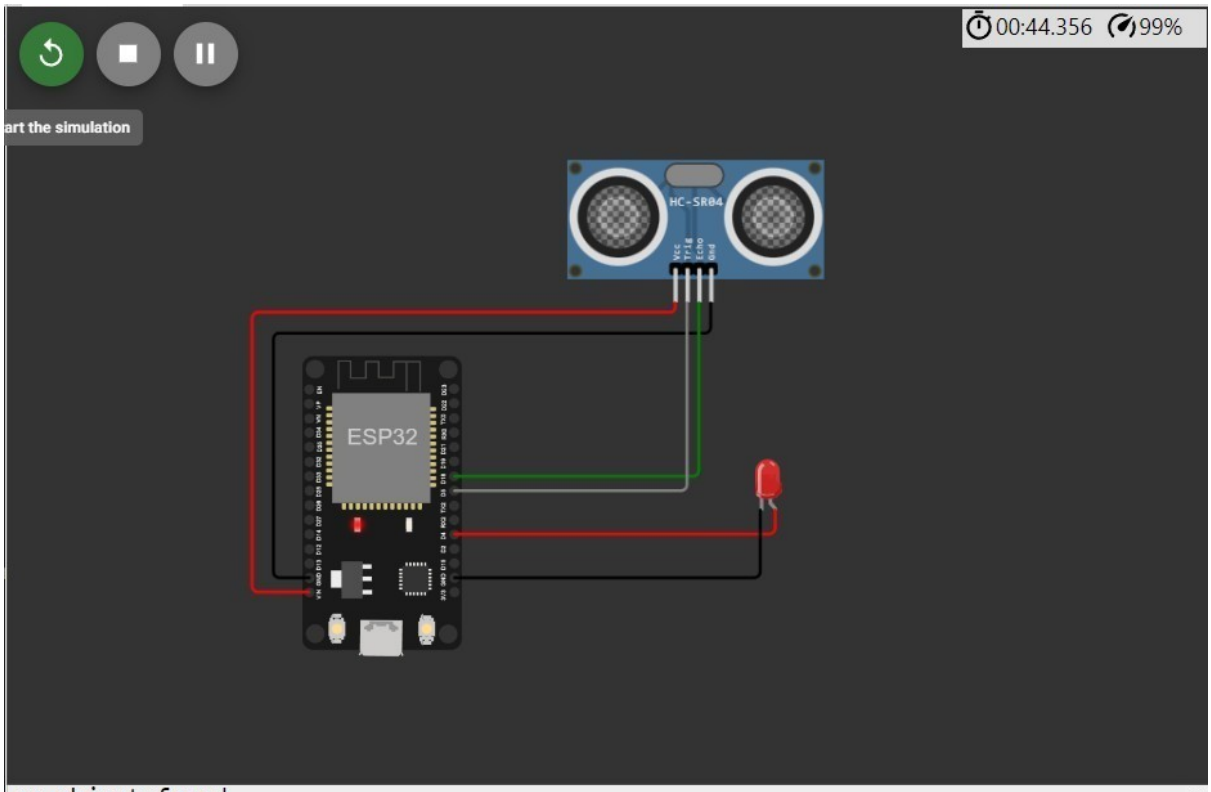
```
 PublishData(dist);
 delay(1000);
 if (!client.loop()) {
  mqttconnect();
 }
}
/*.....retrieving to Cloud.....*/

void PublishData(float dist) {
 mqttconnect();//function call for connecting to ibm
 /*
   creating the String in in form JSon to update the data to ibm cloud
 */
 String object;
 if (dist <100)
 {
  digitalWrite(LED,HIGH);
  Serial.println("object is near");
  object = "Near";
 }
 else
 {
  digitalWrite(LED,LOW);
  Serial.println("no object found");
  object = "No";
 }
 String payload = "{\"distance\":";
 payload += dist;
 payload += "," "\"object\":\"";
```

```
  payload += object;
  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];
  }
data3="";
}
```

Reference: https://wokwi.com/projects/346597491075973714




```
no object found
Sending payload: {"distance":335.90,"object":"No"}
Publish ok
Distancein cm335.90
no object found
Sending payload: {"distance":335.90,"object":"No"}
Publish ok
```

weather_today | Connected | weather_device | Device | Oct 8, 2022 4:58 PM

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	{"distance":262.22,"object":"No"}	json	a few seconds ago
Data	{"distance":262.22,"object":"No"}	json	a few seconds ago
Data	{"distance":262.26,"object":"No"}	json	a few seconds ago
Data	{"distance":53.42,"object":"Near"}	json	a few seconds ago
Data	{"distance":53.42,"object":"Near"}	json	a few seconds ago