

Assignment -4

Assignment Date	31 October 2022
Student Name	Sridhar B
Student Roll Number	611219106072
Maximum Marks	2 Marks

Question-1:

Write code and connections in wokwi for ultrasonic sensor. Whenever distance is less than 100 cm send "alert" to IBM cloud and display in device recent events.

WOWKI LINK:

<https://wokwi.com/projects/347013031284179538>

Solution:

```
#include <WiFi.h>
#include <WiFiClient.h>
#include <PubSubClient.h>
const int trigPin = 5;
const int echoPin = 18;
//define sound speed in cm/uS
#define SOUND_SPEED 0.034
#define CM_TO_INCH 0.393701
long duration;
float distanceCm;
float distanceInch;

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

#define ORG "l3d3kw"//IBM ORGANITION ID
#define DEVICE_TYPE "Assignment-4"//Device
type mentioned in ibm watson IOT Platform
#define DEVICE_ID "SridharID"//Device ID
mentioned in ibm watson IOT Platform
#define TOKEN "-
5kdS4xnWYJKUPWDL!" //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);
```

```
void setup() {  
    Serial.begin(115200); // Starts the serial  
communication  
    pinMode(trigPin, OUTPUT); // Sets the  
trigPin as an Output  
    pinMode(echoPin, INPUT); // Sets the  
echoPin as an Input  
    Serial.println();  
    wificonnect();  
    mqttconnect();  
}
```

```
void loop() {  
    // Clears the trigPin  
    digitalWrite(trigPin, LOW);  
    delayMicroseconds(2);  
    // Sets the trigPin on HIGH state for 10  
micro seconds  
    digitalWrite(trigPin, HIGH);  
    delayMicroseconds(10);  
    digitalWrite(trigPin, LOW);  
  
    // Reads the echoPin, returns the sound  
wave travel time in microseconds  
    duration = pulseIn(echoPin, HIGH);  
  
    // Calculate the distance  
    distanceCm = duration * SOUND_SPEED/2;  
  
    // Convert to inches  
    distanceInch = distanceCm * CM_TO_INCH;  
  
    // Prints the distance in the Serial  
Monitor  
    Serial.print("Distance (cm): ");  
    Serial.println(distanceCm);
```

```

Serial.print("Distance (inch): ");
Serial.println(distanceInch);

PublishData(distanceCm);
delay(1000);
if (!client.loop()) {
    mqttconnect();
}
}

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

```

Output:

WOKWI

SAVE

SHARE

Docs

S

esp32-blink.ino

diagram.json

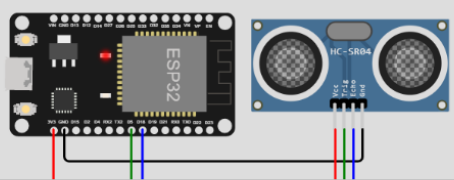
libraries.txt

Library Manager




```
1 #include <WiFi.h>
2 #include <WiFiClient.h>
3 #include <PubSubClient.h>
4 const int trigPin = 5;
5 const int echoPin = 18;
6 //define sound speed in cm/uS
7 #define SOUND_SPEED 0.034
8 #define CM_TO_INCH 0.393701
9 long duration;
10 float distanceCm;
11 float distanceInch;
12
13
14 void callback(char* subscribtopic, byte* payload, unsigned int payloadLength)
15 //-----credentials of IBM Accounts-----
16
17 #define ORG "l3d3kw"//IBM ORGINATION ID
18 #define DEVICE_TYPE "Assignment-4"//Device type mentioned in ibm watson IOT P
19 #define DEVICE_ID "SridharID"//Device ID mentioned in ibm watson IOT Platform
20 #define TOKEN "-5kdS4xnWYJKUPhDL!" //Token
21 String data3;
22
23
24
25 //----- Customise the above values -----
26 char server[] = ORG ".messaging.internetofthings.ibmcloud.com";// Server Name
27 char publishTopic[] = "iot-2/evt/Data/fmt/json";// topic name and type of even
28 char subscribtopic[] = "iot-2/cmd/test/fmt/String";// cmd REPRESENT command
29 char authMethod[] = "use-token-auth";// authentication method
30 char token[] = TOKEN;
```

Simulation

00:24.105 62%



Distance (inch): 85.41
Sending payload: {"Distance (cm)":216.94}
Publish ok
Distance (cm): 216.94
Distance (inch): 85.41
Sending payload: {"Distance (cm)":216.94}
Publish ok

IBM Watson IoT Platform

2k19ece072@kiot.ac.in
ID: l3d3kw

Browse

Action

Device Types

Interfaces

Add Device

Search by Device ID

Device Simulator

Device ID	Status	Device Type	Class ID	Date Added
SridharID	Connected	Assignment-4	Device	Nov 1, 2022 11:49 AM

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 (cm)":19.99}	json	a few seconds ago
Data	{"Distance (cm)":19.99}	json	a few seconds ago
Data	{"Distance (cm)":19.99}	json	a few seconds ago
Data	{"Distance (cm)":19.99}	json	a few seconds ago

0 Simulations running