

ASSIGNMENT TASK - 4

Assignment date	29 October 2022
Project name	Iot Based Smart Crop Protection System for Agriculture
Team ID	PNT2022TMID01702
Maximum mark	2 Marks

QUESTION 1:

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.

CODE:

```
#include <WiFi.h>
#include <PubSubClient.h>
void callback(char* subscribetopic, byte* payload, unsigned int
payloadLength);
#define ORG "akptwo"
#define DEVICE_TYPE "ESP32_Controller"
#define DEVICE_ID "BME280_Sensor"
#define TOKEN "pySeb&4Lc@4tEHID(n"
String data3; float dist;
char server[] = ORG
".messaging.internetofthings.ibmcloud.com"; char publishTopic[]
= "iot-2/evt/Data/fmt/json"; char subscribetopic[] = "iot-
2/cmd/test/fmt/String"; char authMethod[] = "use-token-auth";
char token[] = TOKEN;
char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;

WiFiClient wifiClient;
PubSubClient client(server, 1883, callback ,wifiClient);
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()
{  digitalWrite(trig, LOW);
digitalWrite(trig, HIGH);
delayMicroseconds(10);
digitalWrite(trig, LOW);  float
dur = pulseIn(echo, HIGH);  float
dist = (dur * 0.0343)/2;
    Serial.print ("Distance in cm :");
    Serial.println(dist);

    PublishData(dist);
delay(1000);  if
(!client.loop()) {
mqttconnect();
}
}
void PublishData(float dist) {
mqttconnect();  String
object;  if (dist < 100)  {
    digitalWrite(LED, HIGH);
    Serial.println("object is near");    object
= "Near";
}
else  {
digitalW
rite(LED
, LOW);
Serial.p
rintln("
no
object
found");
object =
"No";
}

String payload = "{\"distance\":";
payload += dist;  payload += ","
"\nobject\":";  payload +=
object;  payload += "\n}";

```

```

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

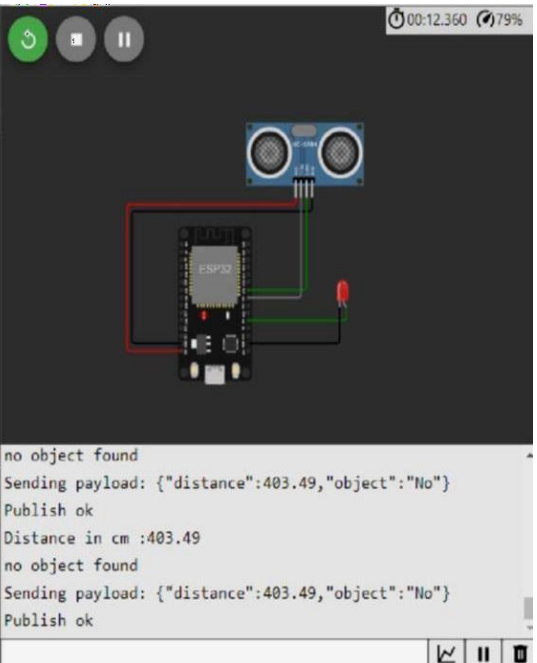
    if (client.publish(publishTopic, (char*) payload.c_str())) {
        Serial.println("Publish ok");
    } else {
        Serial.println("Publish failed");
    } } void mqttconnect() {
if (!client.connected()) {
    Serial.print("Reconnecting client to ");
    Serial.println(server);
    while (!client.connect(clientId, authMethod, token)) {
        Serial.print("."); delay(500);
    }
    initManagedDevice();
    Serial.println();
} }
void wificonnect()
{
    Serial.println();
    Serial.print("Connecting to ");
    WiFi.begin("Wokwi-GUEST", "", 6); 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];
    } data3="";
}

```

OUTPUT:

When object is nearer to Ultrasonic sensor

```
1 #include <WiFi.h>
2 #include <PubSubClient.h>
3
4 void callback(char* subscribetopic, byte* payload, unsigned int payloadLength);
5
6 #define ORG "f59trs"
7 #define DEVICE_TYPE "ultrasonicsensor"
8 #define DEVICE_ID "distancedetection"
9 #define TOKEN "AlGMGaaF0Inawa1QA3"
10 String data3;
11 float dist;
12
13 char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
14 char publishTopic[] = "iot-2/evt/Data/fmt/json";
15 char subscribetopic[] = "iot-2/cmd/test/fmt/String";
16 char authMethod[] = "use-token-auth";
17 char token[] = TOKEN;
18 char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;
19
20
21 WiFiClient wifiClient;
22 PubSubClient client(server, 1883, callback, wifiClient);
23
24 int LED = 4;
25 int trig = 5;
26 int echo = 18;
27 void setup()
28 {
29   Serial.begin(115200);
30   pinMode(trig, OUTPUT);
```



no object found
Sending payload: {"distance":403.49,"object":"No"}
Publish ok
Distance in cm :403.49
no object found
Sending payload: {"distance":403.49,"object":"No"}
Publish ok

Data sent to the ibm cloud when the object is near

Browse Action Device Types Interfaces
Add Device +

Search by Device ID

Device Simulator ☒

	Device ID	Status	Device Type	Class ID	Date Added	Descriptive Location	Added By
▼	12345	Disconnected	RasberryPi	Device	Oct 31, 2022 3:19 PM		venkateshbg01@gmail.com → ...

Identity
Device Information
Recent Events
State
Logs

X

The recent events listed show the live stream of data that is coming and going from this device.

Event	Value	Format	Last Received
Distance	{"distance":-74}	json	a few seconds ago
Distance	{"distance":-89}	json	a few seconds ago
Distance	{"distance":-12}	json	a few seconds ago
Distance	{"distance":-52}	json	a few seconds ago
Distance	{"distance":-45}	json	a few seconds ago

Activate Windows
Go to Settings to activate Windows.

1 Simulation running