

Assignment-4

Assignment Date	25.10.2022
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Maximum marks	2 marks

Question:-

Write a code and connections in wokwi for ultrasonic sensor whenever distance is less than 100 cms send alert to ibm cloud and display in device recent events

program code to connect wowki to ibm cloud:

```
#include <wifi.h>
```

```
#include<PubSubClient.h>
```

```
void callback(char* subscribetopic, byte* payload, unsigned  
int
```

```
payloadLength);
```

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

```
#define ORG "kotoq5"//IBM ORGANITION ID
```

```
#define DEVICE_TYPE "ESP32"//Device type mentioned in ibm  
watson IOT Platform  
  
#define DEVICE_ID "12345"//Device ID mentioned in ibm  
watson IOT Platform  
  
#define TOKEN "12345678" //Token  
  
String data3;  
  
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);  
  
const int trigPin = 5;  
const int echoPin = 18;  
  
#define SOUND_SPEED 0.034  
  
long duration;  
float distance;  
  
void setup() {  
Serial.begin(115200);
```

```
pinMode(trigPin, OUTPUT);
pinMode(echoPin, INPUT);
wificonnect();
mqttconnect();
}
void loop()
{
digitalWrite(trigPin, LOW);
delayMicroseconds(2);
digitalWrite(trigPin, HIGH);
delayMicroseconds(10);
digitalWrite(trigPin, LOW);
duration = pulseIn(echoPin, HIGH);
distance = duration * SOUND_SPEED/2;
Serial.print("Distance (cm): ");
Serial.println(distance);
if(distance<100)
{
Serial.println("ALERT!!");
delay(1000);
PublishData(distance);
```

```
delay(1000);
if (!client.loop()) {
  mqttconnect();
}
}
delay(1000);
}
void PublishData(float dist) {
  mqttconnect();
  String payload = "{\"Distance\":\"";
  payload += dist;
  payload += "\",\"ALERT!!\":\"\"Distance less than 100cms\"";
  payload += "\"}";
  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++) {  
    //Serial.print((char)payload[i]);  
    data3 += (char)payload[i];  
  }  
  Serial.println("data: "+ data3);  
  data3="";}
```

Diagram.json:

```
{
  "version": 1,
  "author": "sweetysharon",
  "editor": "wokwi",
  "parts": [
    { "type": "wokwi-esp32-devkit-v1", "id": "esp", "top": -4.67,
      "left": -114.67, "attrs": {} },
    { "type": "wokwi-hc-sr04", "id": "ultrasonic1", "top": 15.96,
      "left": 89.17, "attrs": {} }
  ],
  "connections": [
    [ "esp:TX0", "$serialMonitor:RX", "", [] ],
    [ "esp:RX0", "$serialMonitor:TX", "", [] ],
    [
      "esp:VIN",
      "ultrasonic1:VCC",
      "red",
      [ "h-37.16", "v-178.79", "h200", "v173.33", "h100.67" ]
    ]
  ],
```

```
[ "esp:GND.1", "ultrasonic1:GND", "black", [ "h39.87",  
"v44.04", "h170" ] ],  
  
[ "esp:D5", "ultrasonic1:TRIG", "green", [ "h54.54", "v85.07",  
"h130.67" ] ],  
  
[ "esp:D18", "ultrasonic1:ECHO", "green", [ "h77.87",  
"v80.01", "h110" ] ]  
]  
}
```

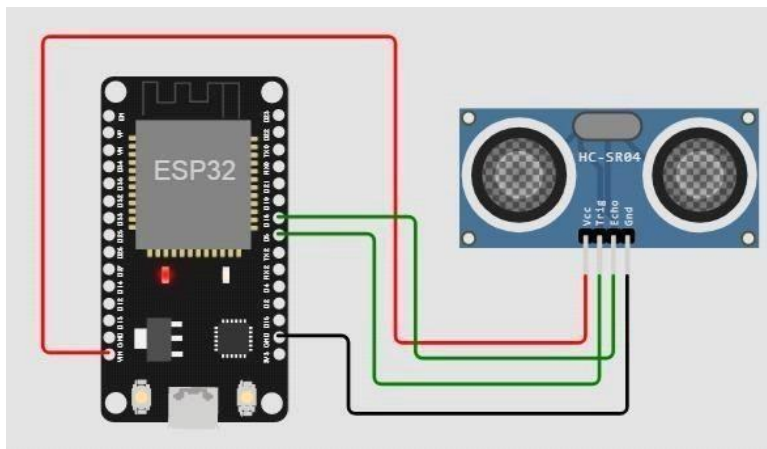
program code:-

```
#define ECHO_PIN 2  
  
#define TRIG_PIN 3  
  
void setup() {  
  Serial.begin(115200);  
  pinMode(LED_BUILTIN, OUTPUT);  
  pinMode(TRIG_PIN, OUTPUT);  
  pinMode(ECHO_PIN, INPUT);  
}  
  
float readDistanceCM() {  
  digitalWrite(TRIG_PIN, LOW);  
  delayMicroseconds(2);  
  digitalWrite(TRIG_PIN, HIGH);  
  delayMicroseconds(10);  
  digitalWrite(TRIG_PIN, LOW);
```



```
int duration = pulseIn(ECHO_PIN, HIGH);  
return duration * 0.034 / 2;  
}  
  
void loop() {  
    float distance = readDistanceCM();  
  
    bool isNearby = distance < 100;  
    digitalWrite(LED_BUILTIN, isNearby);  
  
    Serial.print("Measured distance: ");  
    Serial.println(readDistanceCM());  
  
    delay(100);  
}
```

circuit daigram:-



output:-

```
Connecting to ....
WiFi connected
IP address:
10.10.0.2
Reconnecting client to ytluse.messaging.internetofthings.ibmcloud.com
iot-2/cmd/test/fmt/String
subscribe to cmd OK

Distance (cm): 399.92
Distance (cm): 399.96
Distance (cm): 399.94
Distance (cm): 399.98
Distance (cm): 399.94
Distance (cm): 399.92
Distance (cm): 399.94
```

ibm output:-

BrowseActionDevice TypesInterfaces

Add Device +

IdentityDevice InformationRecent EventsStateLogs

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

Event	Value	Format	Last Received
event_1	{"distance":7,"Alert":"Distance less than 10"}	json	a few seconds ago
event_1	{"distance":9,"Alert":"Distance less than 10"}	json	a few seconds ago
event_1	{"distance":8,"Alert":"Distance less than 10"}	json	a few seconds ago
event_1	{"distance":9,"Alert":"Distance less than 10"}	json	a few seconds ago