

Government College of Engineering – salem 11

ASSIGNMENT -4

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DEPT : ECE

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Write 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.

```
#include <WiFi.h>
#include <PubSubClient.h>
void callback(char* subscribetopic, byte* payload, unsigned int
payloadLength);
//-----credentials of IBM Accounts-----
#define ORG "jesccj"//IBM ORGANITION ID
#define DEVICE_TYPE "ESP32_Controller"//Device type mentioned in ibm watson
IOT Platform
#define DEVICE_ID "BME280_Sensor"//Device ID mentioned in ibm watson IOT
Platform
#define TOKEN "KImxM@H69iIBD&JYZC" //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": "Anonymous maker",
  "editor": "wokwi",
  "parts": [

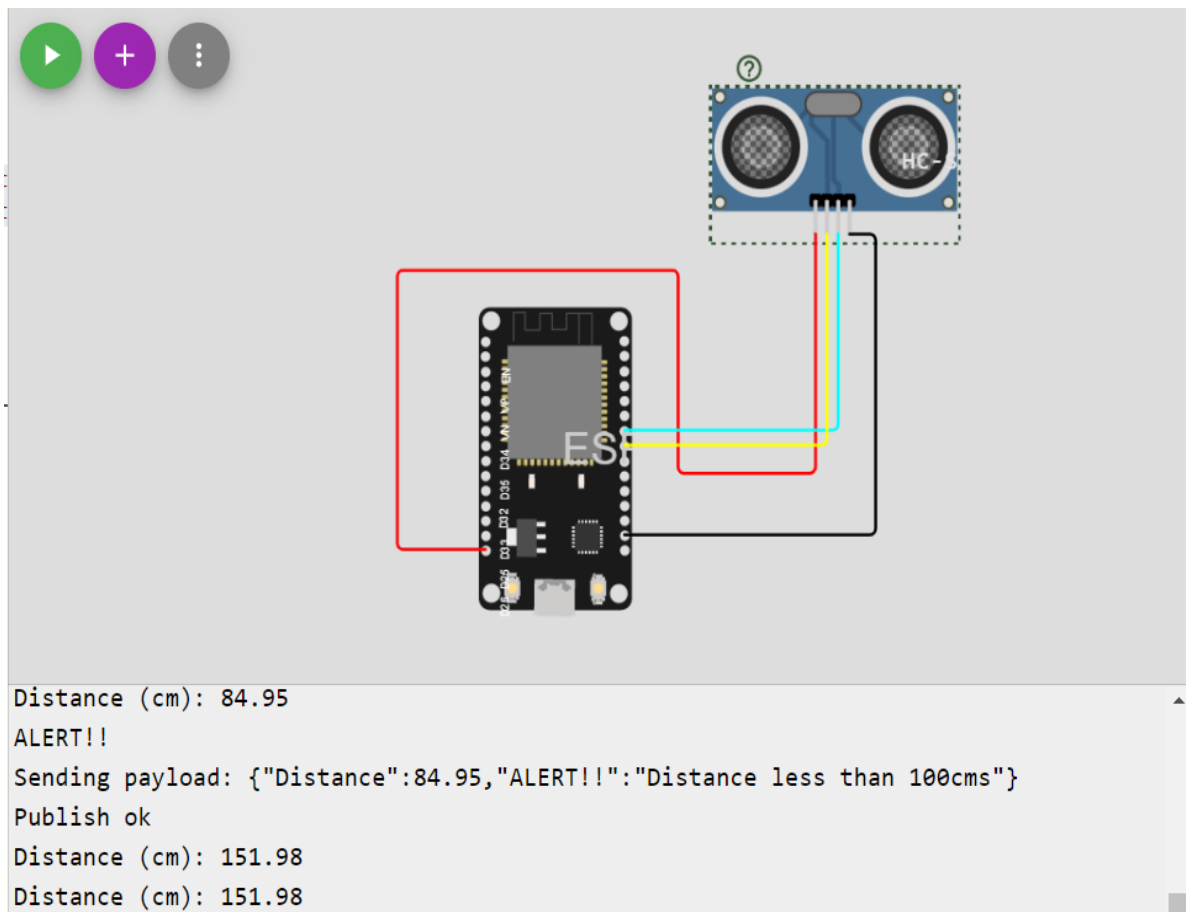
```

```

    { "type": "wokwi-esp32-devkit-v1", "id": "esp", "top": -106.69, "left":
1567.63, "attrs": {} },
    { "type": "wokwi-hc-sr04", "id": "ultrasonic1", "top": -245.94, "left":
1729.41, "attrs": {} }
  ],
  "connections": [
    [ "esp:TX0", "$serialMonitor:RX", "", [] ],
    [ "esp:RX0", "$serialMonitor:TX", "", [] ],
    [
      "esp:VIN",
      "ultrasonic1:VCC",
      "red",
      [ "h-60.86", "v-179.91", "h194.33", "v130.8", "h91.18" ]
    ],
    [
      "esp:D18", "ultrasonic1:ECHO", "cyan", [ "h0" ] ],
    [
      "esp:D5", "ultrasonic1:TRIG", "yellow", [ "h0" ] ],
    [
      "esp:GND.1", "ultrasonic1:GND", "black", [ "h173.94", "v-9.72" ] ]
  ]
}

```

DIAGRAM:



WOKWI OUTPUT:

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

Distance (cm): 6.00
ALERT!!
Sending payload: {"Distance":6.00,"ALERT!!":"Distance less than 100cms"}
Publish ok
Distance (cm): 5.95
ALERT!!
Reconnecting client to jesccej.messaging.internetofthings.ibmcloud.com
iot-2/cmd/test/fmt/String
subscribe to cmd OK

Sending payload: {"Distance":5.95,"ALERT!!":"Distance less than 100cms"}
Publish ok
Distance (cm): 84.95
ALERT!!
```

```
Distance (cm): 5.95
ALERT!!
Reconnecting client to jesccej.messaging.internetofthings.ibmcloud.com
iot-2/cmd/test/fmt/String
subscribe to cmd OK

Sending payload: {"Distance":5.95,"ALERT!!":"Distance less than 100cms"}
Publish ok
Distance (cm): 84.95
ALERT!!
Sending payload: {"Distance":84.95,"ALERT!!":"Distance less than 100cms"}
Publish ok
Distance (cm): 84.95
ALERT!!
Sending payload: {"Distance":84.95,"ALERT!!":"Distance less than 100cms"}
Publish ok
Distance (cm): 84.95
ALERT!!
Sending payload: {"Distance":84.95,"ALERT!!":"Distance less than 100cms"}
Publish ok
Distance (cm): 151.98
Distance (cm): 151.98
Distance (cm): 151.98
```

IBM OUTPUT :

The screenshot displays the IBM Watson IoT Platform interface. The top navigation bar includes 'Browse', 'Action', 'Device Types', and 'Interfaces'. A sidebar on the left contains various icons for navigation. The main content area shows a list of devices, with 'BME280_Sensor' selected. The device status is 'Connected' and it is an 'ESP32_Controller' type. The 'Recent Events' tab is active, showing a table of data events.

Device: BME280_Sensor, Status: Connected, Type: ESP32_Controller, Last Received: Nov 2, 2022 3:18 PM

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":84.95,"ALERT!!":"Distance less than ...	json	a few seconds ago
Data	{"Distance":84.95,"ALERT!!":"Distance less than ...	json	a few seconds ago
Data	{"Distance":84.95,"ALERT!!":"Distance less than ...	json	a few seconds ago
Data	{"Distance":5.95,"ALERT!!":"Distance less than 1...	json	a few seconds ago
Data	{"Distance":6,"ALERT!!":"Distance less than 100c...	json	a minute ago

Wokwi simulation link:

<https://wokwi.com/projects/347210401624097363>