

Sethu Institute Of Technology - Kariapatti

ASSIGNMENT -4

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CSE

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="";
}

```

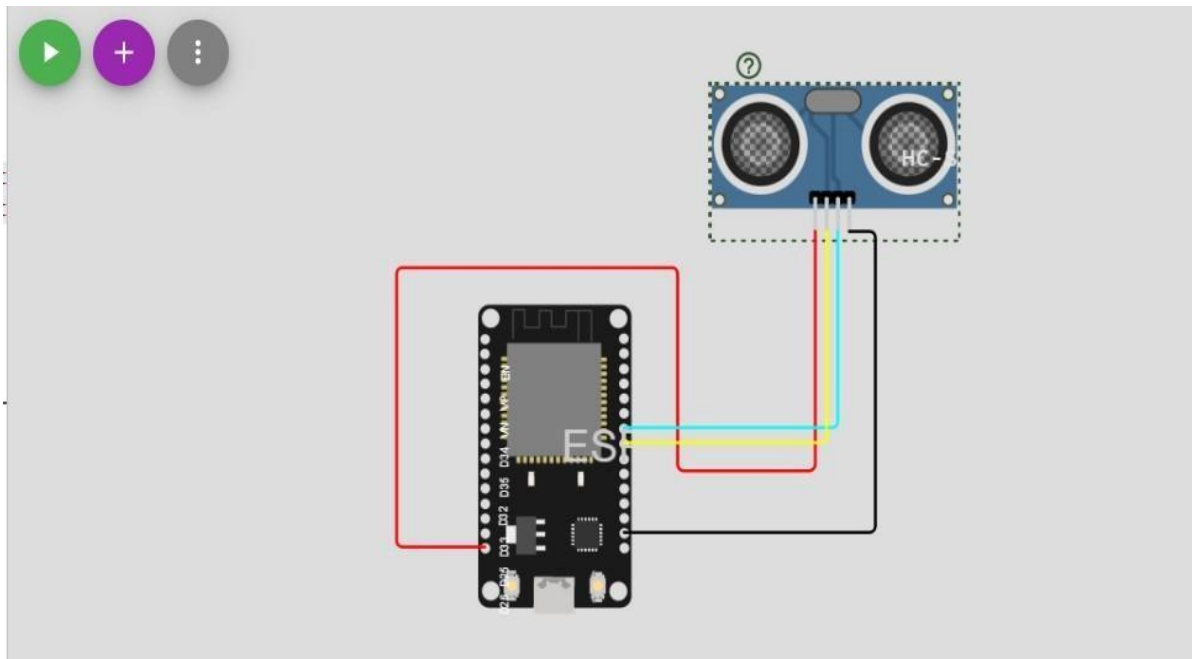
DIAGRAM.JSON

```

{
  "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:



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

WOKWI OUTPUT:

Simulation

Connecting to ...
WiFi connected
IP address:
10.10.0.2
Reconnecting client to jesscj.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 jesscj.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!!

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Distance (cm): 5.95
ALERT!!
Reconnecting client to jesscj.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

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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 the controller is 'ESP32_Controller'. The 'Recent Events' tab is active, showing a table of events.

IBM Watson IoT Platform

12345 Unconnected NOOEM10U Device Oct 19, 2022 11:16 AM

BME280_Sensor Connected ESP32_Controller Device Nov 2, 2022 3:18 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":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>