Assignment -4

Python Programming for WOKWI

Assignment Date	31 OCTOBER2022
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Maximum Marks	2 Marks

Question-1:

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.

SOLUTION :

```
#include <WiFi.h>
#include <PubSubClient.h>
void callback(char* subscribetopic, byte* payload, unsigned int
payloadLength);
//-------credentials of IBM Accounts------
#define ORG "rv07c6"//IBM ORGANITION ID
#define DEVICE_TYPE "distance_hcsr04"//Device type mentioned in ibm watson IOT
#define DEVICE_ID "6789"//Device ID mentioned in ibm watson IOT Platform
#define TOKEN "w_mwV+5NZn*W7Xt)qA" //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);
```

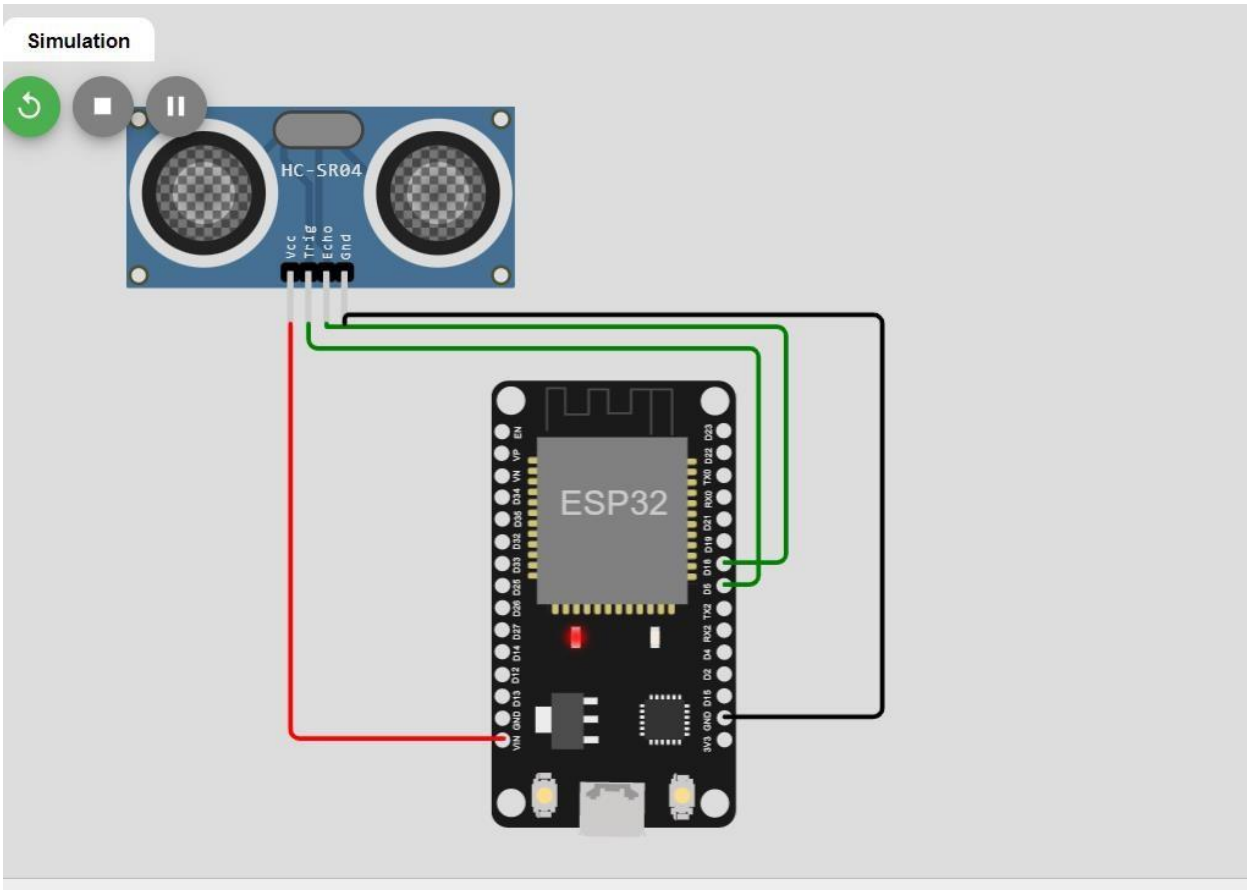
```
digitalWrite(trigPin, HIGH);
delayMicroseconds(10);
digitalWrite(trigPin, LOW);
duration = pulseIn(echoPin, HIGH);
distance = random(200);
Serial.print("Distance (cm): ");
Serial.println(distance);
if(distance<100)
{
Serial.println("ALERT!!");
delay(1000);
PublishData(distance);
delay(1000);
if (!client.loop()) {
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="";
}
```

WOKWI SAVE SHARE

sketch.ino ● diagram.json ● libraries.txt ● Library Manager

```
{
  "version": 1,
  "author": "Rithika Murugesan",
  "editor": "wokwi",
  "parts": [
    { "type": "wokwi-esp32-devkit-v1", "id": "esp", "top": 30, "left": 46.67, "attrs": {} },
    { "type": "wokwi-hc-sr04", "id": "ultrasonic1", "top": -86.9, "left": -113.17, "attrs": {} }
  ],
  "connections": [
    [ "esp:TX0", "$serialMonitor:RX", "", [] ],
    [ "esp:RX0", "$serialMonitor:TX", "", [] ],
    [ "ultrasonic1:VCC", "esp:VIN", "red", [ "v0" ] ],
    [ "ultrasonic1:TRIG", "esp:D5", "green", [ "v10.57", "h196.33", "v102" ] ],
    [ "ultrasonic1:ECHO", "esp:D18", "green", [ "v1.23", "h200.44", "v103.33" ] ],
    [ "ultrasonic1:GND", "esp:GND.1", "black", [ "v-4.1", "h234.55", "v188" ] ]
  ]
}
```



WOKWI LINK:

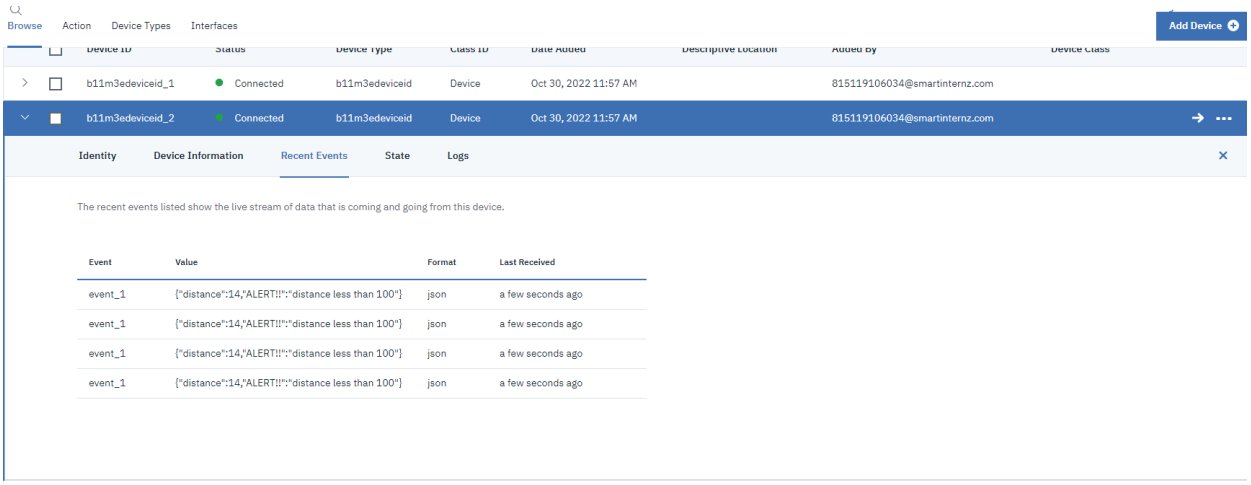
https://wokwi.com/projects/347024840001061458

WOKWI OUTPUT:

```
WiFi connected
IP address:
10.10.0.2
Reconnecting client to rv07c6.messaging.internetofthings.ibmcloud.com
iot-2/cmd/test/fmt/String
subscribe to cmd OK

Distance (cm): 108.00
Distance (cm): 22.00
ALERT!!
Sending payload: {"Distance":22.00,"ALERT!!":"Distance less than 100cms"}
Publish ok
Distance (cm): 37.00
ALERT!!
Sending payload: {"Distance":37.00,"ALERT!!":"Distance less than 100cms"}
Publish ok
Distance (cm): 101.00
Distance (cm): 109.00
Distance (cm): 146.00
Distance (cm): 146.00
Distance (cm): 199.00
Distance (cm): 135.00
Distance (cm): 148.00
```

IBM CLOUD OUTPUT:


Browse
Action
Device Types
Interfaces
Add Device
Device ID
Status
Device Type
Class ID
Date Added
Descriptive Location
Added By
Device Class
b11m3edeviceid_1
Connected
b11m3edeviceid
Device
Oct 30, 2022 11:57 AM
815119106034@smartinternz.com
b11m3edeviceid_2
Connected
b11m3edeviceid
Device
Oct 30, 2022 11:57 AM
815119106034@smartinternz.com
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
event_1
{"distance":14,"ALERT!!":"distance less than 100"}
json
a few seconds ago
event_1
{"distance":14,"ALERT!!":"distance less than 100"}
json
a few seconds ago
event_1
{"distance":14,"ALERT!!":"distance less than 100"}
json
a few seconds ago
event_1
{"distance":14,"ALERT!!":"distance less than 100"}
json
a few seconds ago