ASSIGNMENT-4

PYTHON PROGRAMMING

Assignment date	24-10-2022
Team Id	PNT2022TMID30880
Maximum marks	2 Marks

Write a code and connections in wokwi for the ultrasonic sensor. Whenever the distance is less than 100cms send an "Alert" to IBM cloud and display in the device recent events.

Code:

```
#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 "123"//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" ] ]
```

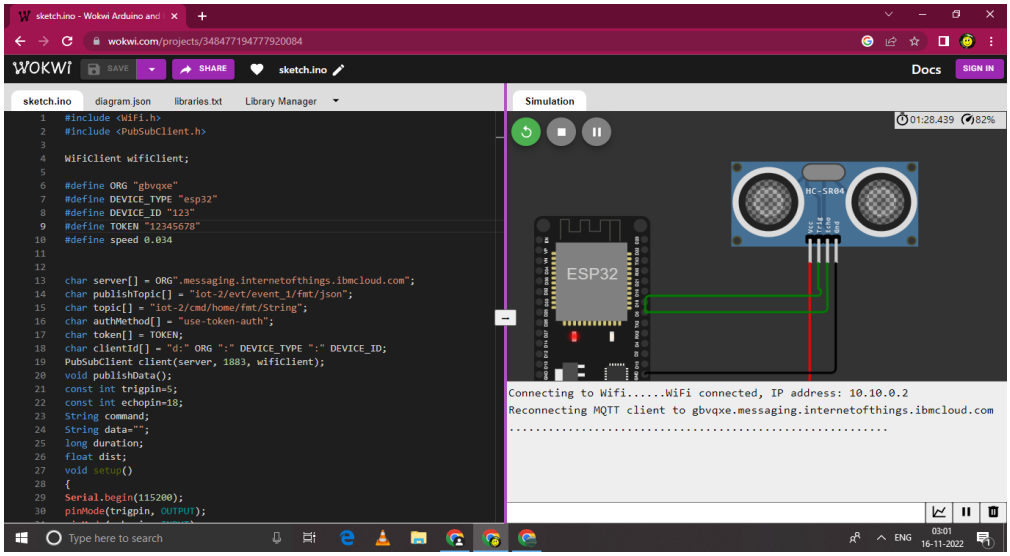
]

}

Wowki output :

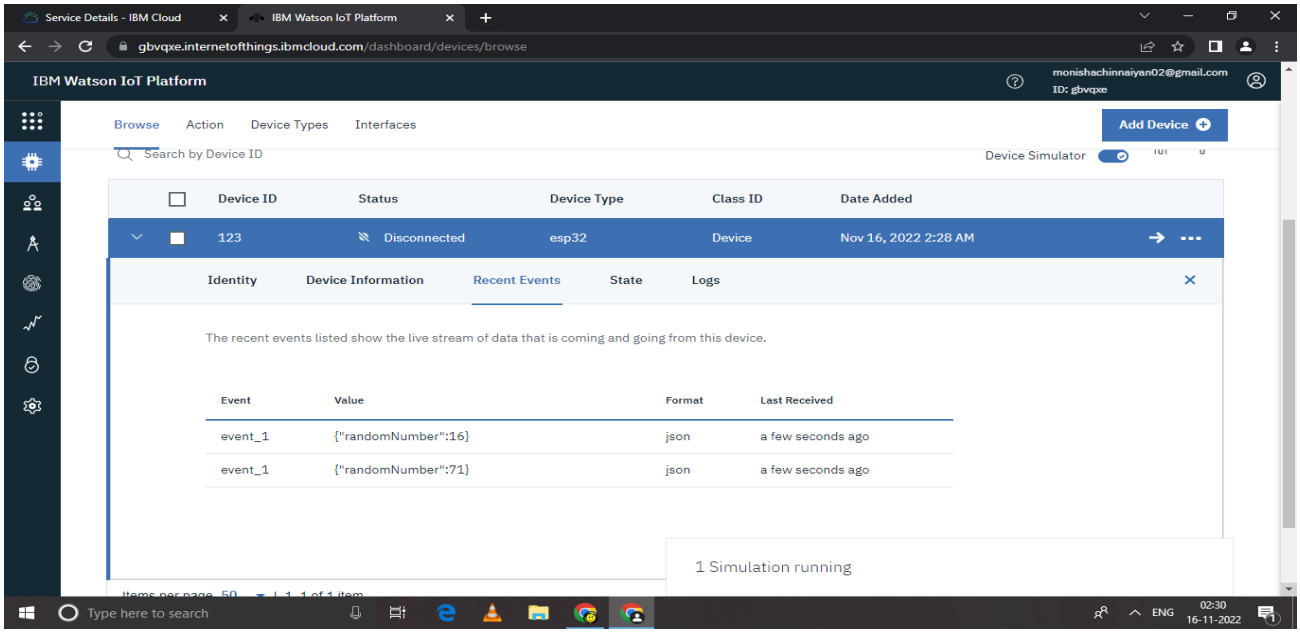
```
Connecting to ....
WiFi connected
IP address:
10.10.0.2
Reconnecting client to ytluse.messaging.internetofthings.ibmcloud.com
iot-2/cmd/test/fmt/String
subscribe to cmd OK

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 CLOUD OUTPUT:



)

https://wokwi.com/projects/348477194777920084


Service Details - IBM Cloud
IBM Watson IoT Platform
gbvqxe.internetofthings.ibmcloud.com/dashboard/devices/browse
IBM Watson IoT Platform
monishachinnaiyan02@gmail.com
ID: gbvqxe
Browse
Action
Device Types
Interfaces
Add Device
Search by Device ID
Device Simulator
Device ID
Status
Device Type
Class ID
Date Added
123
Disconnected
esp32
Device
Nov 16, 2022 2:28 AM
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
{"randomNumber":16}
json
a few seconds ago
event_1
{"randomNumber":71}
json
a few seconds ago
1 Simulation running
Type here to search
ENG
02:30
16-11-2022