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 "m89nt2"//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" ] ]
```

]

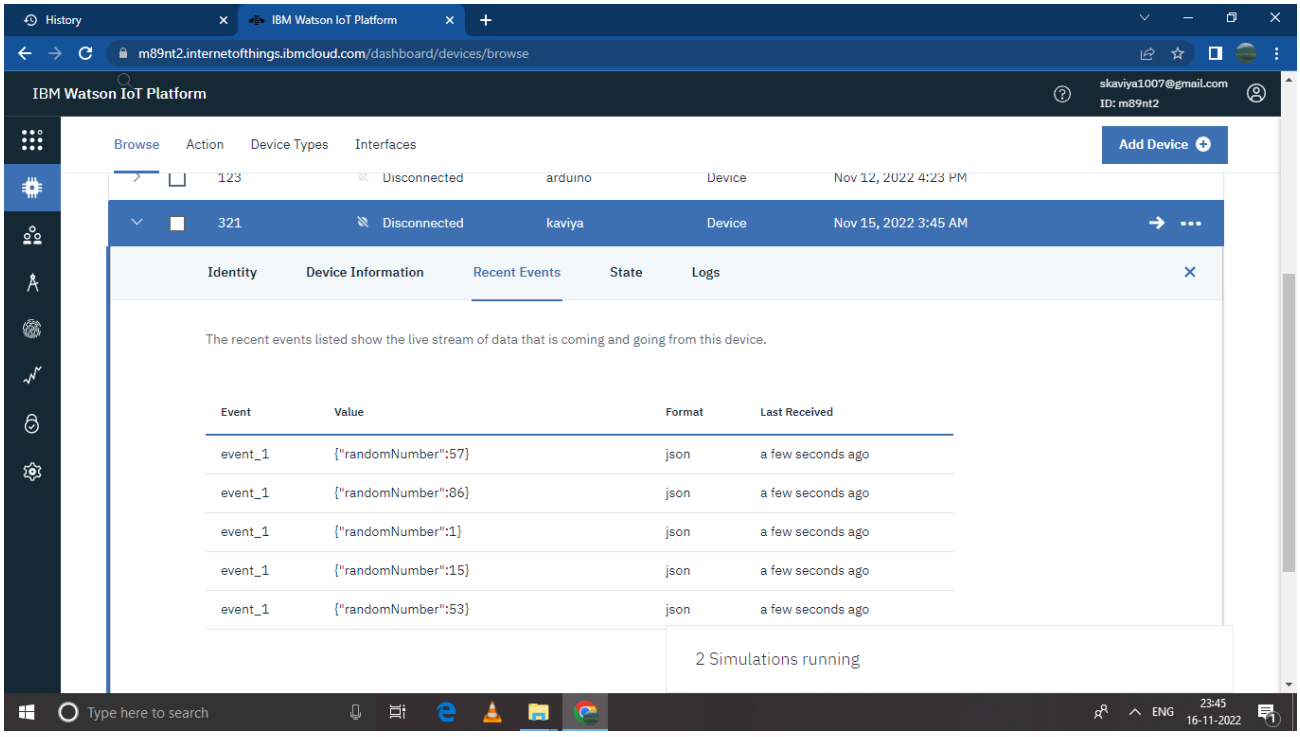
}

Wokwi output:

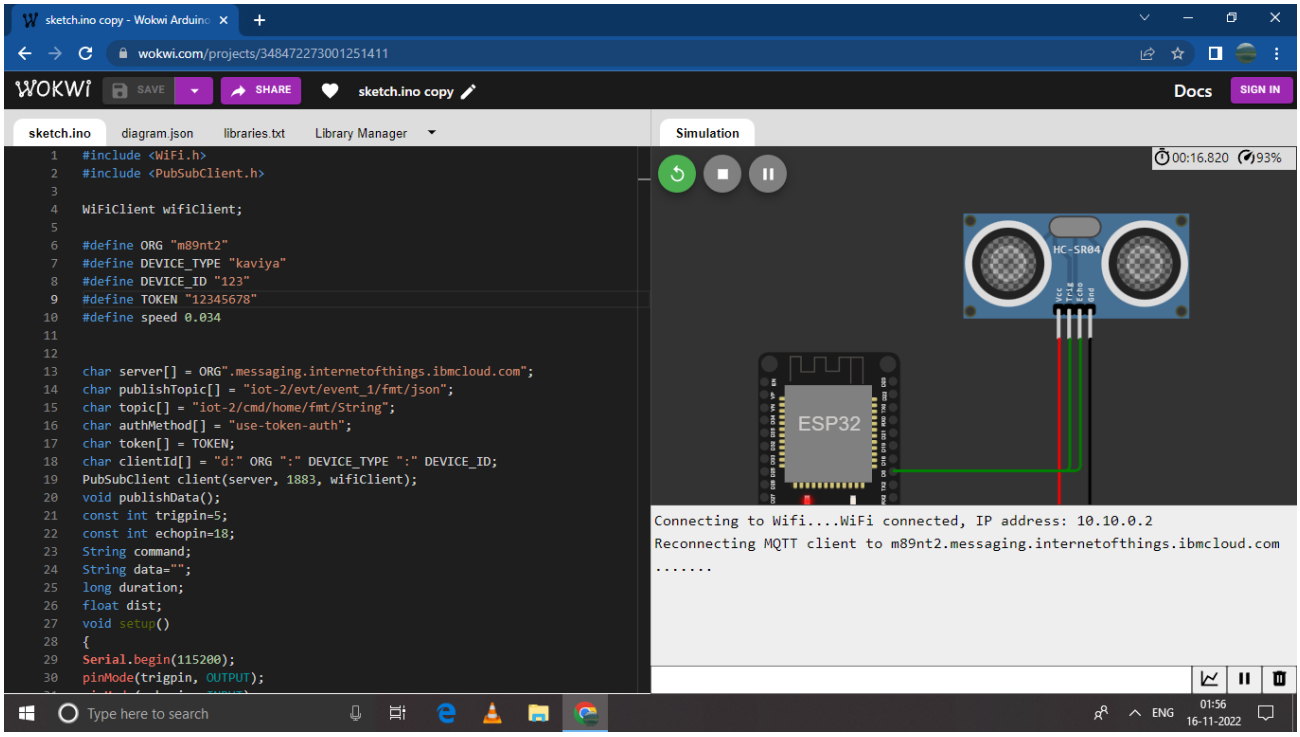
```
Connecting to ....
WiFi connected
IP address:
10.10.0.2
Reconnecting client to ytluse.messaging.internetofthings.ibmcloud.com
iot-2/cmd/test/fmt/String
subscribe to cmd OK

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
```

https://wokwi.com/projects/348473409733132882



IBM cloud output:




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

WiFiClient wifiClient;

#define ORG "m89nt2"
#define DEVICE_TYPE "kaviya"
#define DEVICE_ID "123"
#define TOKEN "12345678"
#define speed 0.034


char server[] = ORG".messaging.internetofthings.ibmcloud.com";
char publishTopic[] = "iot-2/evt/event_1/fmt/json";
char topic[] = "iot-2/cmd/home/fmt/String";
char authMethod[] = "use-token-auth";
char token[] = TOKEN;
char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;
PubSubClient client(server, 1883, wifiClient);
void publishData();
const int trigpin=5;
const int echopin=18;
String command;
String data="";
long duration;
float dist;
void setup()
{
Serial.begin(115200);
pinMode(trigpin, OUTPUT);
```

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