

Assignment-4

Assignment Date	29 October 2022
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Maximum Marks	2 Marks

Question :

Write Code and Connections in Wokwi for Ultrasonic Sensor. Whenever Distance is less than 100 cm send "Alert" to IBM Cloud and Display in Device Recent Events.

Source Code :

```
#include <WiFi.h>
#include <PubSubClient.h>
void callback(char* subscribetopic,byte* payload, unsigned int payloadLength);
#define ORG "7f5hee"//IBM ORGANITION ID
#define DEVICE_TYPE "testdevicetype"//Device type mentioned in ibm watson IOT Platform
#define DEVICE_ID "12345"//Device ID mentioned in ibm watson IOT Platform
#define TOKEN "AQCLi6rYJrcoiDpW6?" //Token
String data3;
char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
char publishTopic[] = "iot-2/evt/distance/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);
#define ECHO_PIN 12
#define TRIG_PIN 13
#define led 2
void setup() {
// put your setup code here, to run once:
Serial.begin(115200);
pinMode(led, OUTPUT);
pinMode(TRIG_PIN, OUTPUT);
pinMode(ECHO_PIN, INPUT);
wificonnect();
mqttconnect();
}
float readDistanceCM() {
digitalWrite(TRIG_PIN, LOW);// Clear the trigger
delayMicroseconds(2);
digitalWrite(TRIG_PIN, HIGH);// Sets the trigger pin to HIGH state for 10 microseconds
delayMicroseconds(10);
digitalWrite(TRIG_PIN, LOW);
```

```

int duration=pulseIn(ECHO_PIN, HIGH);
//Serial.println(duration);
//duration = pulseIn(ECHO_PIN, HIGH);
return duration*0.017;
//Serial.println(duration);
}
void loop() {
float distance = readDistanceCM();
//Serial.println(distance);
bool isNearby = distance < 100;
digitalWrite(led, isNearby);
Serial.print("Measured distance: ");
Serial.println(distance);
if(distance<100){
PublishData2(distance);
}else{
PublishData1(distance);
}
//PublishData(distance);
delay(1000);
if(!client.loop()){
mqttconnect();
}
//delay(2000);
}
void PublishData1(float dist){
mqttconnect();
String payload= "{\"distance\":";
payload += dist;
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 PublishData2(float dist){
mqttconnect();
String payload= "{\"ALERT\":";
payload += dist;
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 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++){
data3 += (char)payload[i];
}
Serial.println("data:"+ data3);
if(data3=="lighton"){
Serial.println(data3);
digitalWrite(led,HIGH);
}else{

```

```

Serial.println(data3);
digitalWrite(led, LOW);
}
data3="";
}

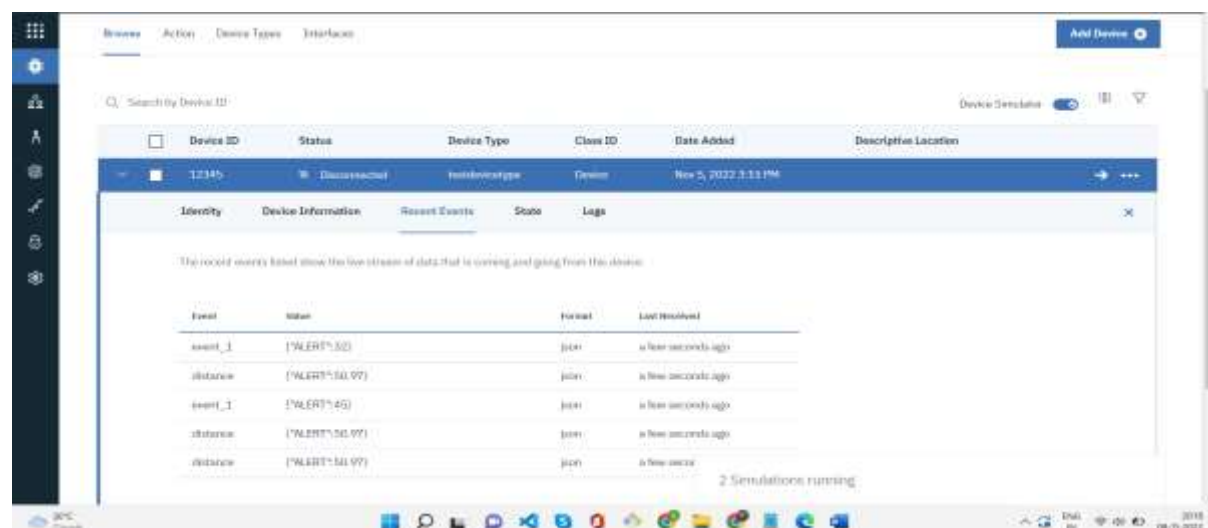
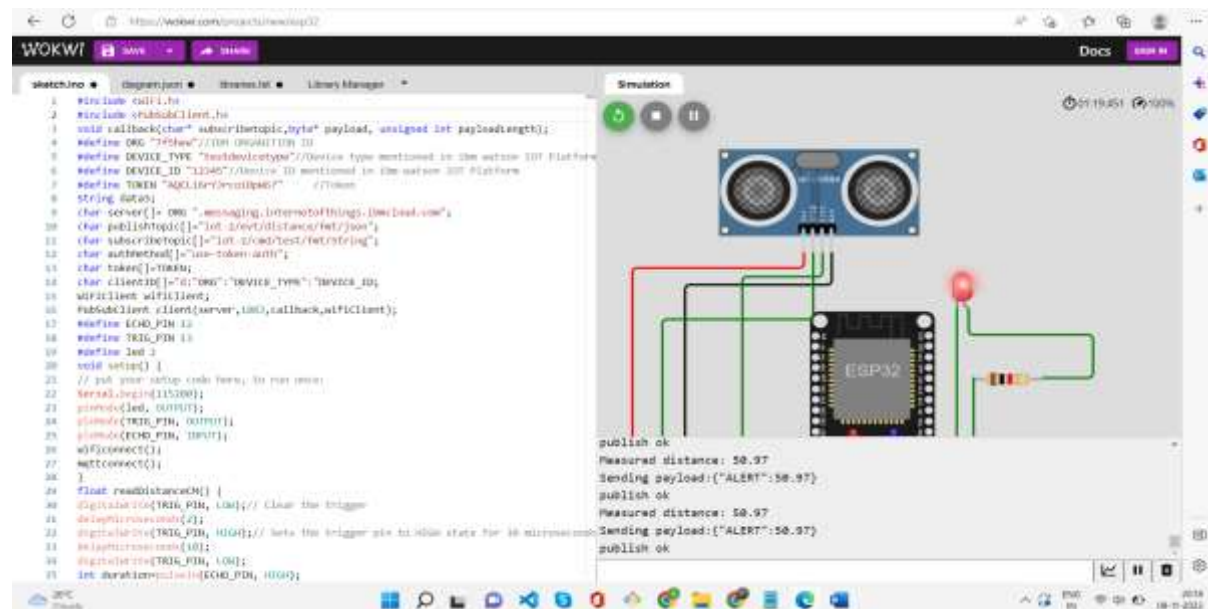
```

Reference :

<https://wokwi.com/projects/347771952330441300>

Output:

1) Distance less than 100cm – LED Bulb Glows and ‘Alert’ Message is Displayed along with Distance



2) Distance more than 100cm – LED Bulb OFF and Distance is Displayed

