Assignment -4

Assignment Date	27.10.2022
Student Name	Mr.W.Merun raj
Student Roll Number	821919104012
Maximum Marks	2 Marks

Question :

Write code and connections in wokwi for the ultrasonic sensor. Whenever the distance is less than 100 cms send an "alert" to the IBM cloud and display in the device recent events. Upload document with wokwi share link and images of IBM cloud.

Wokwi Link:

https://wokwi.com/projects/322410731508073042

Code:

```
#include <WiFi.h>
#include <PubSubClient.h>
WiFiClient wifiClient;
String data3;
#define ORG "r29hf1"
#define DEVICE_TYPE "merun"
#define DEVICE_ID "Assignment4"
#define TOKEN "123456789"
#define speed 0.034
#define led 14
char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
char publishTopic[] = "iot-2/evt/data/fmt/json";
char topic[] = "iot-2/cmd/home/fmt/String";
char authMethod[] = "use-token-auth";
char token[] = TOKEN;
```

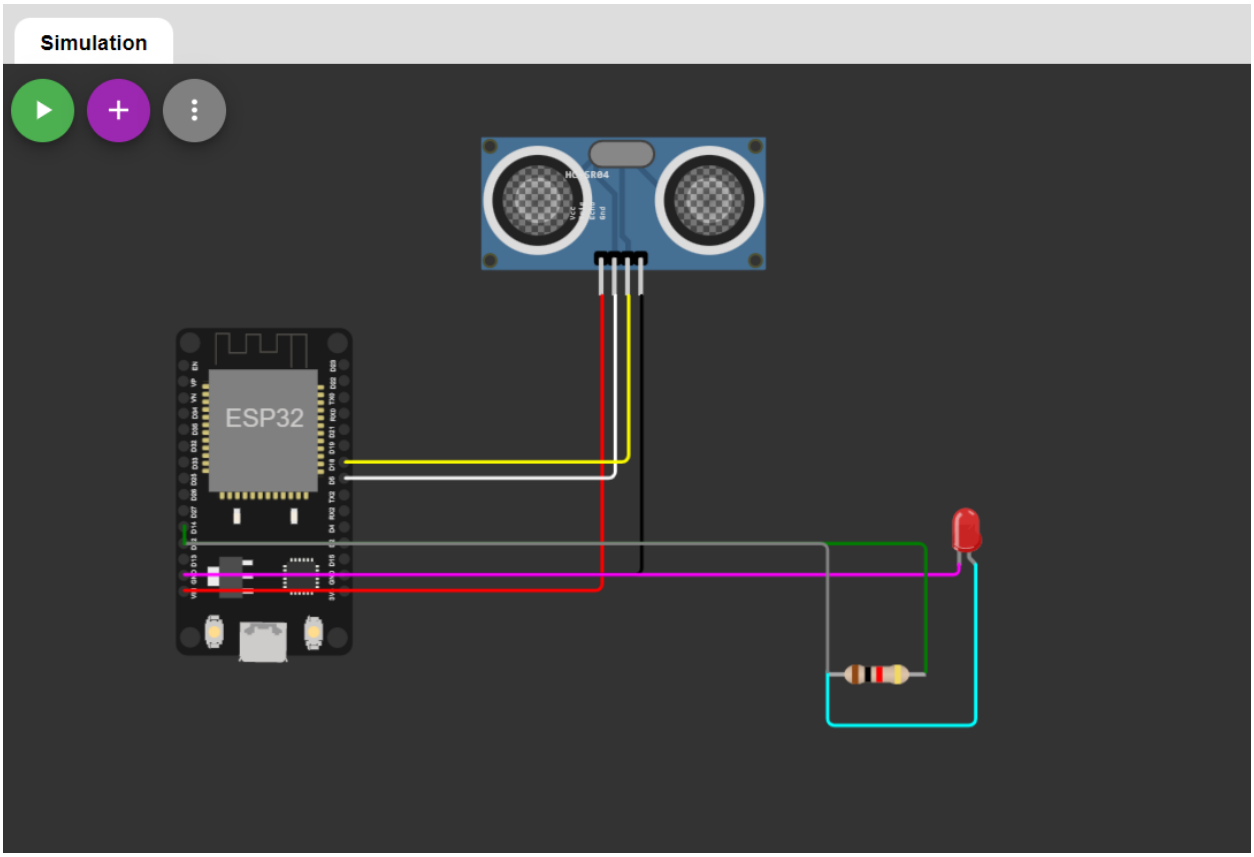
```
char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;
PubSubClient client(server, 1883, wifiClient);
void publishData();
const int trigpin = 5;
const int echopin = 18;
String command;
String data = "";
long duration;
float dist;

void setup()
{
Serial.begin(115200);
pinMode(led, OUTPUT);
pinMode(trigpin, OUTPUT);
pinMode(echopin, INPUT);
wifiConnect();
mqttConnect();
}
void loop() {
bool isNearby = dist < 100;
digitalWrite(led, isNearby);
publishData();
delay(500);
if (!client.loop()) {
mqttConnect();
}
}
void wifiConnect() {
Serial.print("Connecting to "); Serial.print("Wifi");
WiFi.begin("Wokwi-GUEST", "", 6);
while (WiFi.status() != WL_CONNECTED) {
delay(500);
Serial.print(".");
}
Serial.print("WiFi connected, IP address: ");
Serial.println(WiFi.localIP());
}
void mqttConnect() {
if (!client.connected()) {
Serial.print("Reconnecting MQTT client to "); Serial.println(server);
while (!client.connect(clientId, authMethod, token)) {
Serial.print(".");
delay(500);
}
```

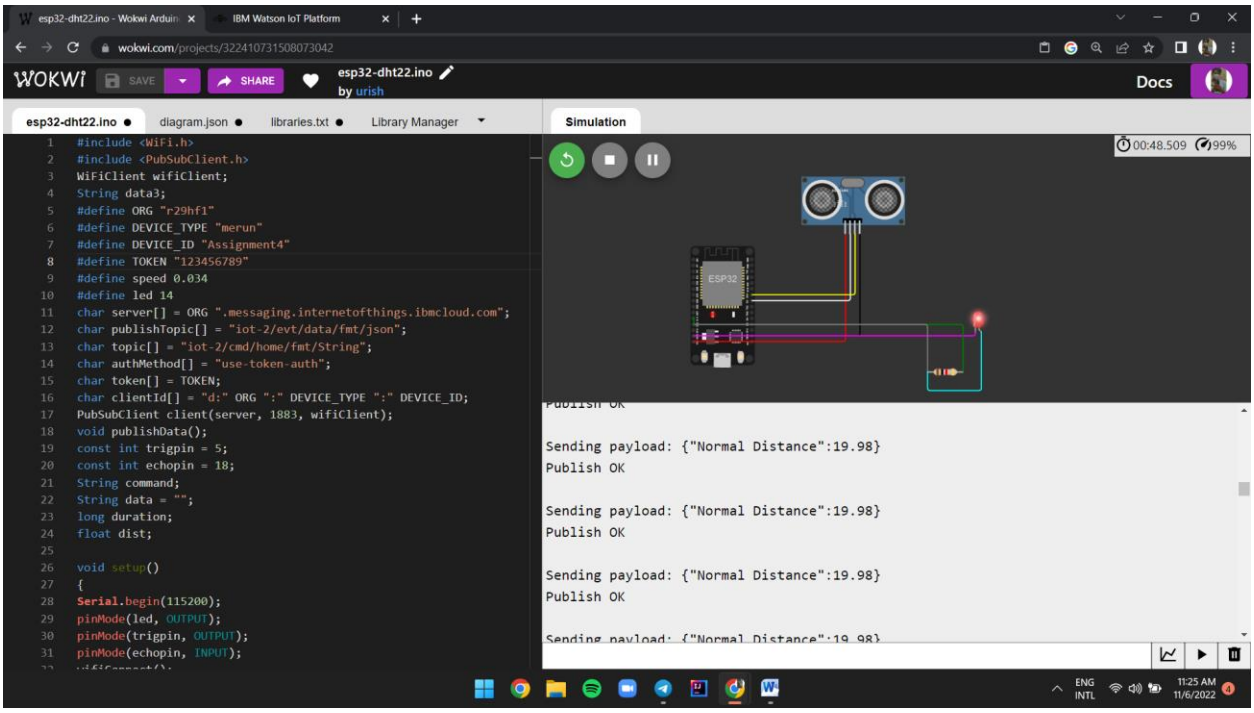
```
initManagedDevice();
Serial.println();
}
}
void initManagedDevice() {
if (client.subscribe(topic)) {
// Serial.println(client.subscribe(topic));
Serial.println("IBM subscribe to cmd OK");
} else {
Serial.println("subscribe to cmd FAILED");
}
}
void publishData()
{
digitalWrite(trigpin, LOW);
digitalWrite(trigpin, HIGH);
delayMicroseconds(10);
digitalWrite(trigpin, LOW);
duration = pulseIn(echopin, HIGH);
dist = duration * speed / 2;
if (dist < 100) {
String payload = "{\"Normal Distance\":";
payload += dist;
payload += "}";
Serial.print("\n");
Serial.print("Sending payload: ");
Serial.println(payload);
if (client.publish(publishTopic, (char*) payload.c_str())) {
Serial.println("Publish OK");
}
}
if (dist > 101 ) {
String payload = "{\"Alert distance\":";
payload += dist;
payload += "}";
Serial.print("\n");
Serial.print("Sending payload: ");
Serial.println(payload);
if (client.publish(publishTopic, (char*) payload.c_str())) {
Serial.println("Warning crosses 110cm -- it automaticaly of the loop");
digitalWrite(led, HIGH);
} else {
Serial.println("Publish 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++) {
dist += (char)payload[i];
}
Serial.println("data:" + data3);
if (data3 == "lighton") {
Serial.println(data3);
digitalWrite(led, HIGH);
}
data3 = "";
}
```

Circuit Diagram:



Output:


esp32-dht22.ino - Wokwi Arduin
IBM Watson IoT Platform
wokwi.com/projects/322410731508073042
WOKWI
SAVE
SHARE
esp32-dht22.ino
by urish
Docs
esp32-dht22.ino
diagram.json
libraries.txt
Library Manager
Simulation
00:48.509
99%
ESP32
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WiFiClient wifiClient;
String data3;
#define ORG "r29hf1"
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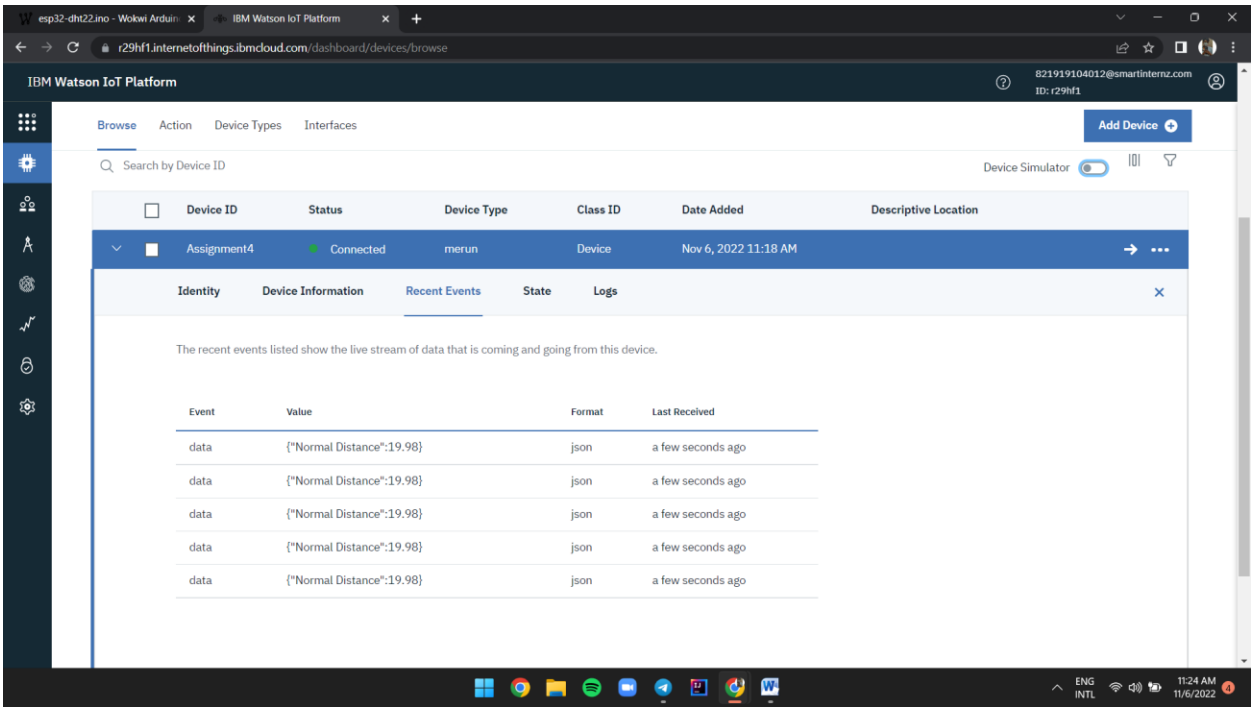
PubSubClient client(server, 1883, wifiClient);
void publishData();
const int trigpin = 5;
const int echopin = 18;
String command;
String data = "";
long duration;
float dist;
void setup()
{
Serial.begin(115200);
pinMode(led, OUTPUT);
pinMode(trigpin, OUTPUT);
pinMode(echopin, INPUT);
Sending payload: {"Normal Distance":19.98}
Publish OK
Sending payload: {"Normal Distance":19.98}
Publish OK
Sending payload: {"Normal Distance":19.98}
Publish OK
ENG
INTL
11:25 AM
11/6/2022


esp32-dht22.ino - Wokwi Arduin
IBM Watson IoT Platform
r29hf1.internetofthings.ibmcloud.com/dashboard/devices/browse
IBM Watson IoT Platform
821919104012@smartinternz.com
ID: r29hf1
Browse
Action
Device Types
Interfaces
Add Device
Search by Device ID
Device Simulator
Device ID
Status
Device Type
Class ID
Date Added
Descriptive Location
Assignment4
Connected
merun
Device
Nov 6, 2022 11:18 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
data
{"Normal Distance":19.98}
json
a few seconds ago
data
{"Normal Distance":19.98}
json
a few seconds ago
data
{"Normal Distance":19.98}
json
a few seconds ago
data
{"Normal Distance":19.98}
json
a few seconds ago
data
{"Normal Distance":19.98}
json
a few seconds ago
ENG
INTL
11:24 AM
11/6/2022