Assignment - 4

Assignment Date	02 November 2022
Student Name	Ms.Y.Safreen Banu
Student Roll Number	821919104023
Maximum Marks	2 marks

Question -1:

Write code and connections in wokwi for the ultrasonic sensor. Whenever the distance is less than 100cms 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.

Wowki Link:

https://wokwi.com/projects/347392537590235730

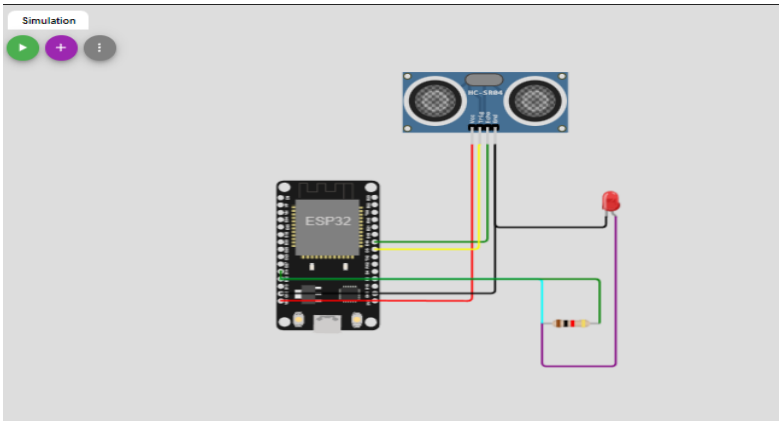
Code:

```
#include <WiFi.h>
#include <PubSubClient.h>
WiFiClient wifiClient;
String data3;
#define ORG "yet4pm"
#define DEVICE_TYPE "Assignment4"
#define DEVICE_ID "12345"
#define TOKEN "12345678"
#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()
```

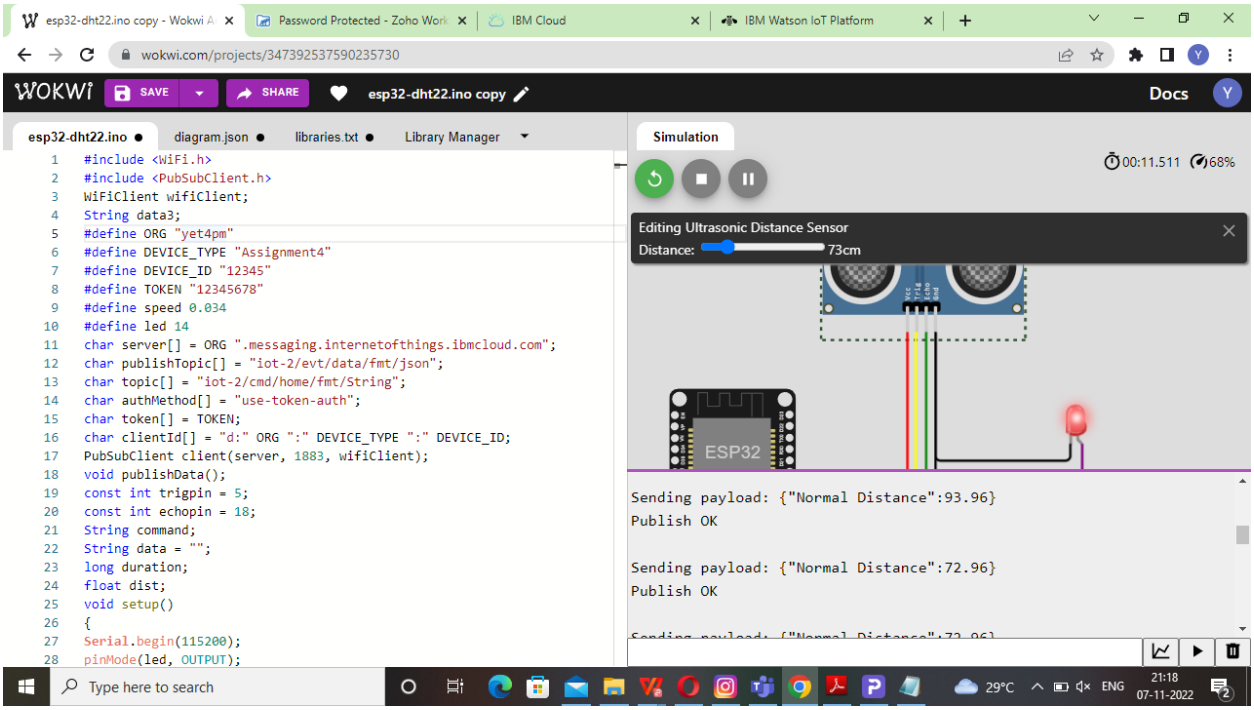
```
{
Serial.begin(115200);
pinMode(led, OUTPUT);
pinMode(trigpin, OUTPUT);
pinMode(echopin, INPUT);
wifiConnect();
mqttConnect();
}
void loop() {
bool isNearby = dist < 100;
digitalWrite(led, isNearby);
publishData();
delay(500);
if (!client.loop()) {
mqttConnect();
}}
void wifiConnect() {
Serial.print("Connecting 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);
```

```
76  dist = duration * speed / 2;
77  if (dist < 100) {
78  String payload = "{\"Normal Distance\":";
79  payload += dist;
80  payload += "}";
81  Serial.print("\n");
82  Serial.print("Sending payload: ");
83  Serial.println(payload);
84  if (client.publish(publishTopic, (char*) payload.c_str())) {
85  Serial.println("Publish OK");
86  }}
87  if (dist > 101 ) {
88  String payload = "{\"Alert distance\":";
89  payload += dist;
90  payload += "}";
91  Serial.print("\n");
92  Serial.print("Sending payload: ");
93  Serial.println(payload);
94  if (client.publish(publishTopic, (char*) payload.c_str())) {
95  Serial.println("Warning crosses 110cm -- it automaticaly of the loop");
96  digitalWrite(led, HIGH);
97  } else {
98  Serial.println("Publish FAILED");
99  }}
100 }
101 void callback(char* subscribeTopic, byte* payload, unsigned int payloadLength)
102 {
103 Serial.print("callback invoked for topic:");
104 Serial.println(subscribeTopic);
105 for (int i = 0; i < payloadLength; i++) {
106 dist += (char)payload[i];
107 }
108 Serial.println("data:" + data3);
109 if (data3 == "lighton") {
110 Serial.println(data3);
111 digitalWrite(led, HIGH);
112 }
113 data3 = "";
114 }
```

Circuit Diagram:



Output:


esp32-dht22.ino copy - Wokwi
Password Protected - Zoho Work
IBM Cloud
IBM Watson IoT Platform
wokwi.com/projects/347392537590235730
WOKWI
SAVE
SHARE
esp32-dht22.ino copy
Docs
esp32-dht22.ino
diagram.json
libraries.txt
Library Manager
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const int trigpin = 5;
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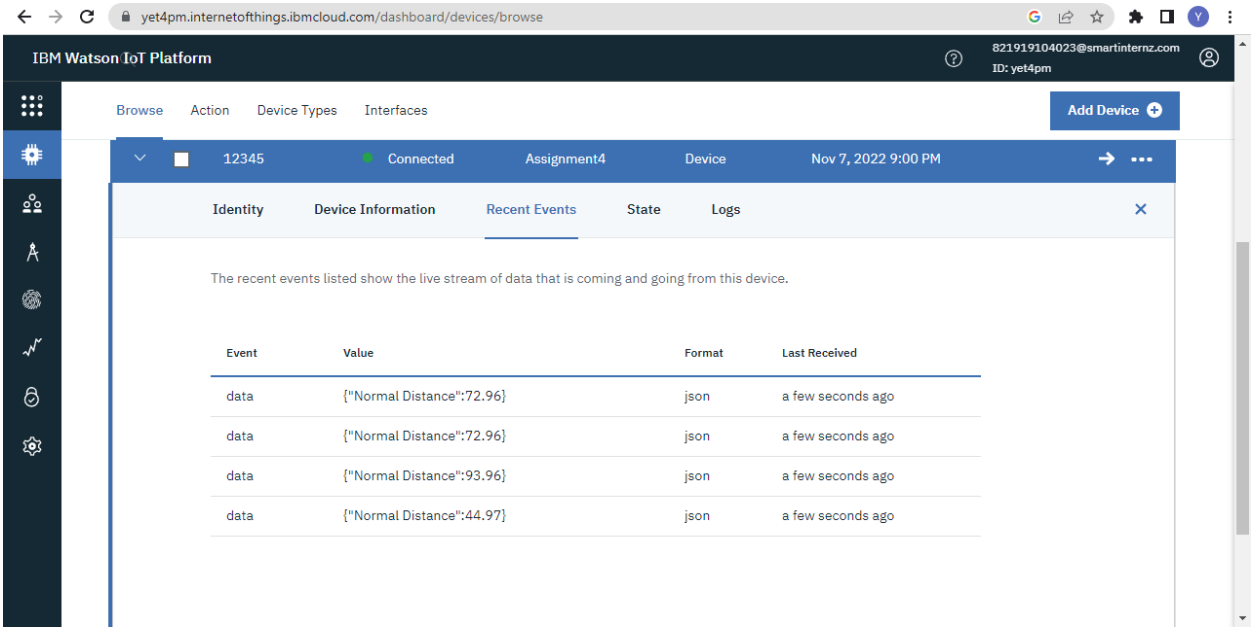
String command;
String data = "";
long duration;
float dist;
void setup()
{
Serial.begin(115200);
pinMode(led, OUTPUT);
Simulation
00:11.511
68%
Editing Ultrasonic Distance Sensor
Distance:
73cm
ESP32
Sending payload: {"Normal Distance":93.96}
Publish OK
Sending payload: {"Normal Distance":72.96}
Publish OK
Type here to search
29°C
ENG
21:18
07-11-2022


yet4pm.internetofthings.ibmcloud.com/dashboard/devices/browse
IBM Watson IoT Platform
821919104023@smartinternz.com
ID: yet4pm
Browse
Action
Device Types
Interfaces
Add Device
12345
Connected
Assignment4
Device
Nov 7, 2022 9:00 PM
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":72.96}
json
a few seconds ago
data
{"Normal Distance":72.96}
json
a few seconds ago
data
{"Normal Distance":93.96}
json
a few seconds ago
data
{"Normal Distance":44.97}
json
a few seconds ago