Assignment -4

Assignment Date	08 November 2022
Student Name	BASWAREDDY VEDIkA
Student Roll Number	111919106003
Maximum Marks	2 Marks

Question-1: 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.

Soln:

```
#include <WiFi.h>
#include <PubSubClient.h>
void callback(char* subscribetopic, byte* payload, unsigned int
payloadLength);
#define ORG "fo8tkk"
#define DEVICE_TYPE "Wokwi"
#define DEVICE_ID "21222122"
#define TOKEN "87654321"
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++) {
data3 += (char)payload[i];
}
Serial.println("data: "+ data3);
data3="";
}
```

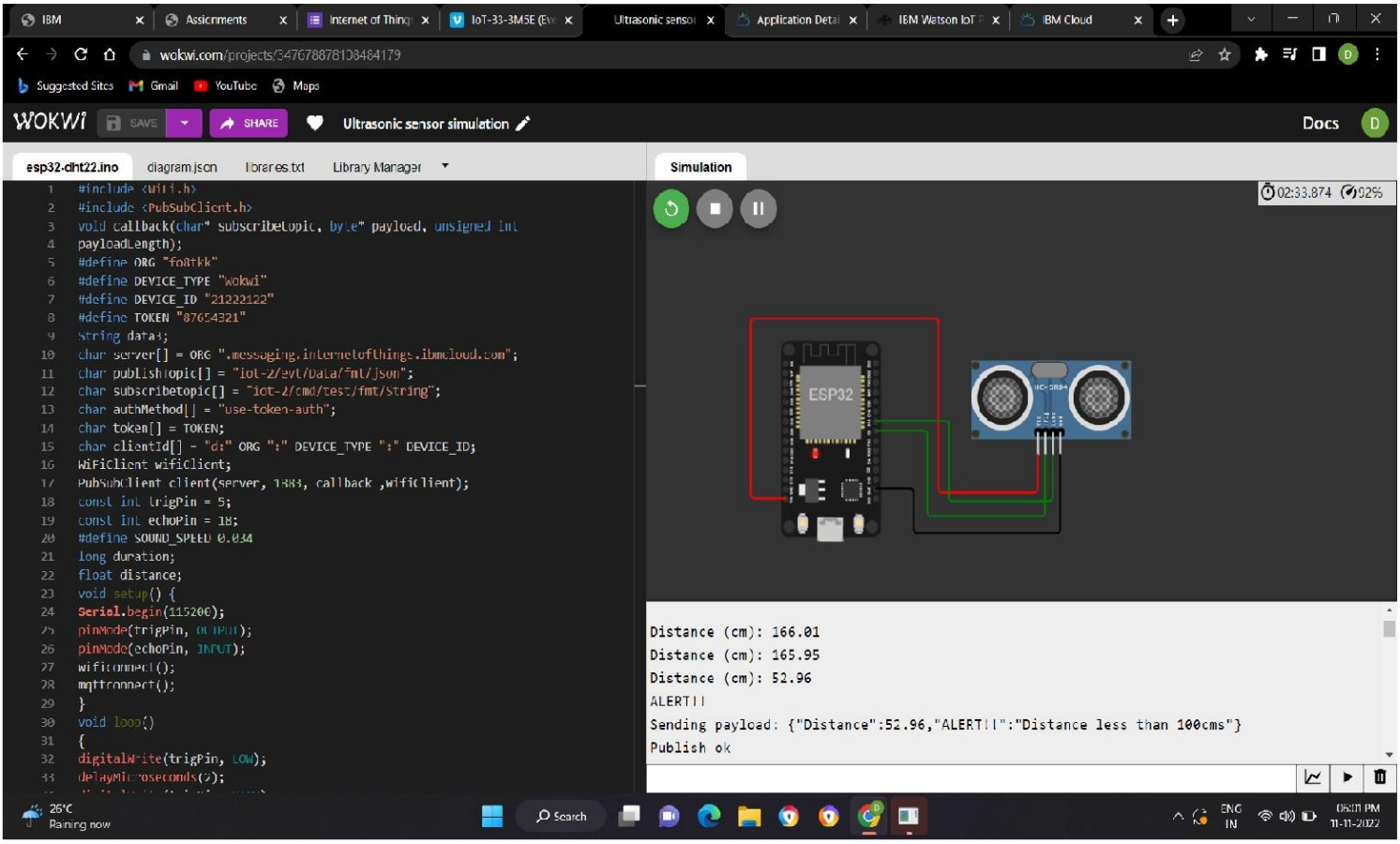
//diagram.json

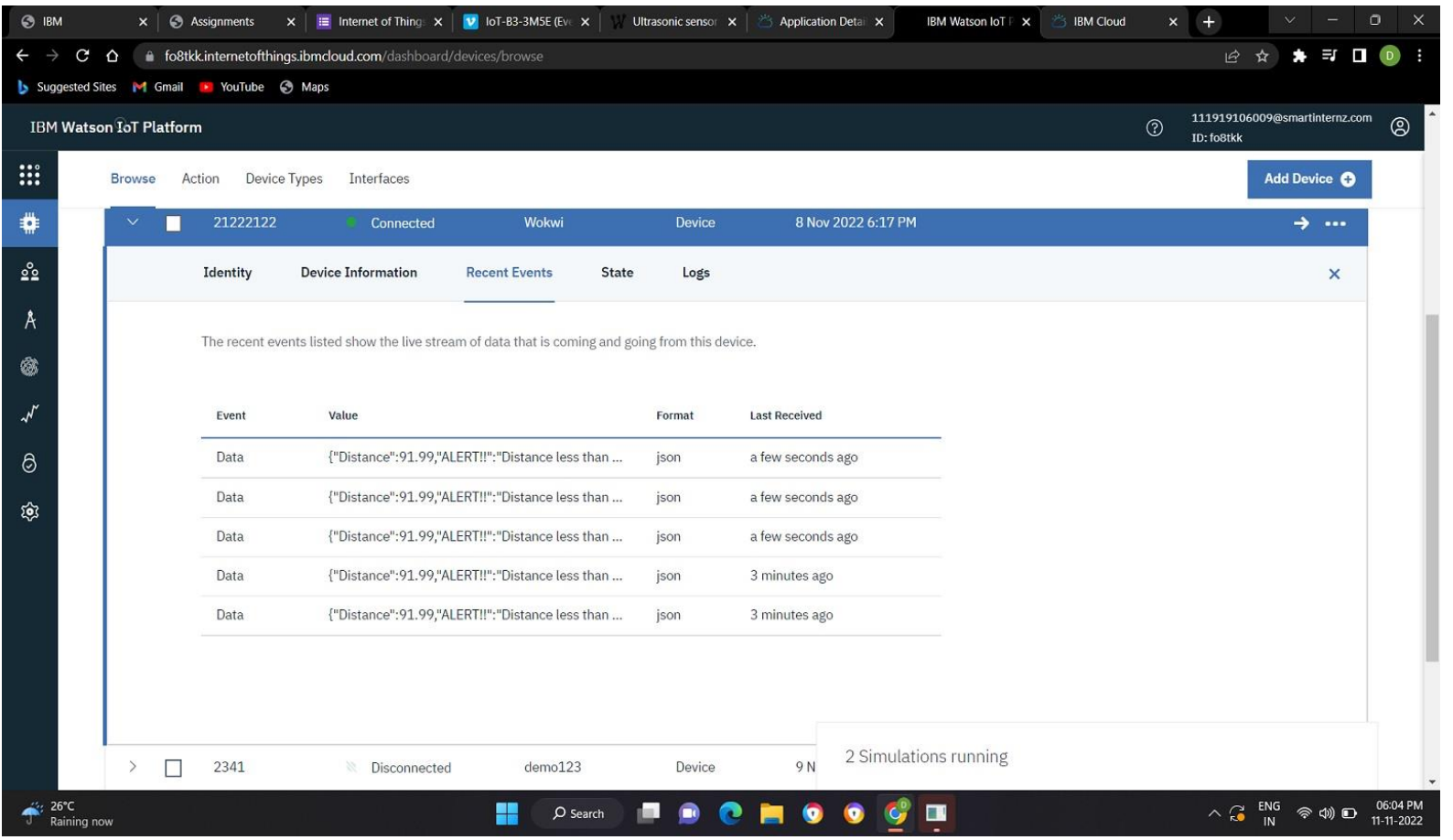
```
{
  "version": 1,
  "author": "sweetysharon",
  "editor": "wokwi",
  "parts": [
    { "type": "wokwi-esp32-devkit-v1", "id": "esp", "top": -4.67, "left": -
112.87, "attrs": {} },
    { "type": "wokwi-hc-sr04", "id": "ultrasonic1", "top": 15.96, "left":
89.17, "attrs": {} }
  ],
  "connections": [
    [ "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 LINK:

https://wokwi.com/projects/347678878108484179


IBM
Assignments
Internet of Things
IoT-33-3M5E (Evt
Ultrasonic sensor
Application Detail
IBM Watson IoT P
IBM Cloud
wokwi.com/projects/347678878108464179
Suggested Sites
Gmail
YouTube
Maps
WOKWI
SAVE
SHARE
Ultrasonic sensor simulation
Docs
esp32-dht22.ino
diagram.json
libraries.txt
Library Manager
Simulation
02:33.874
92%
ESP32
Distance (cm): 166.01
Distance (cm): 165.95
Distance (cm): 52.96
ALERT!!
Sending payload: {"Distance":52.96,"ALERT!!":"Distance less than 100cms"}
Publish ok
26°C
Raining now
Search
ENG
IN
06:11 PM
11-11-2022


IBM
Assignments
Internet of Things
IoT-B3-3M5E (Ev
Ultrasonic sensor
Application Detai
IBM Watson IoT
IBM Cloud
fo8tkk.internetofthings.ibmcloud.com/dashboard/devices/browse
Suggested Sites
Gmail
YouTube
Maps
IBM Watson IoT Platform
111919106009@smartinternz.com
ID: fo8tkk
Browse
Action
Device Types
Interfaces
Add Device
21222122
Connected
Wokwi
Device
8 Nov 2022 6:17 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
{"Distance":91.99,"ALERT!!":"Distance less than ...
json
a few seconds ago
Data
{"Distance":91.99,"ALERT!!":"Distance less than ...
json
a few seconds ago
Data
{"Distance":91.99,"ALERT!!":"Distance less than ...
json
a few seconds ago
Data
{"Distance":91.99,"ALERT!!":"Distance less than ...
json
3 minutes ago
Data
{"Distance":91.99,"ALERT!!":"Distance less than ...
json
3 minutes ago
2341
Disconnected
demo123
Device
9 N
2 Simulations running
26°C
Raining now
Search
ENG
IN
06:04 PM
11-11-2022