**ASSIGNMENT 4**

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| Assignment Date | 15 November 2022 |
| Student Name | R.Devika |
| Student Roll Number | 91761915010 |
| Maximum Marks | 2 Marks |

Ultrasonic sensor simulation in Wokwi

Question :

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.

**Solution:**

**Source Code:**

**sketch.ino**

#include <WiFi.h>

#include <PubSubClient.h>

void callback(char\* subscribetopic, byte\* payload, unsigned int

payloadLength);

#define ORG "9lxobn"

#define DEVICE\_TYPE "ESP32PROJECT"

#define DEVICE\_ID "ESP32"

#define TOKEN "ESP32PROJECT"

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": "038 subhashini",

"editor": "wokwi",

"parts": [

{ "type": "wokwi-esp32-devkit-v1", "id": "esp", "top": 23.33, "left": -106, "attrs": {} },

{ "type": "wokwi-hc-sr04", "id": "ultrasonic1", "top": -15.04, "left": 86.5, "attrs": {} }

],

"connections": [

[ "esp:TX0", "$serialMonitor:RX", "", [] ],

[ "esp:RX0", "$serialMonitor:TX", "", [] ],

[ "ultrasonic1:VCC", "esp:VIN", "red", [ "v168.58", "h-279.11", "v-66" ] ],

[ "ultrasonic1:GND", "esp:GND.1", "black", [ "v0" ] ],

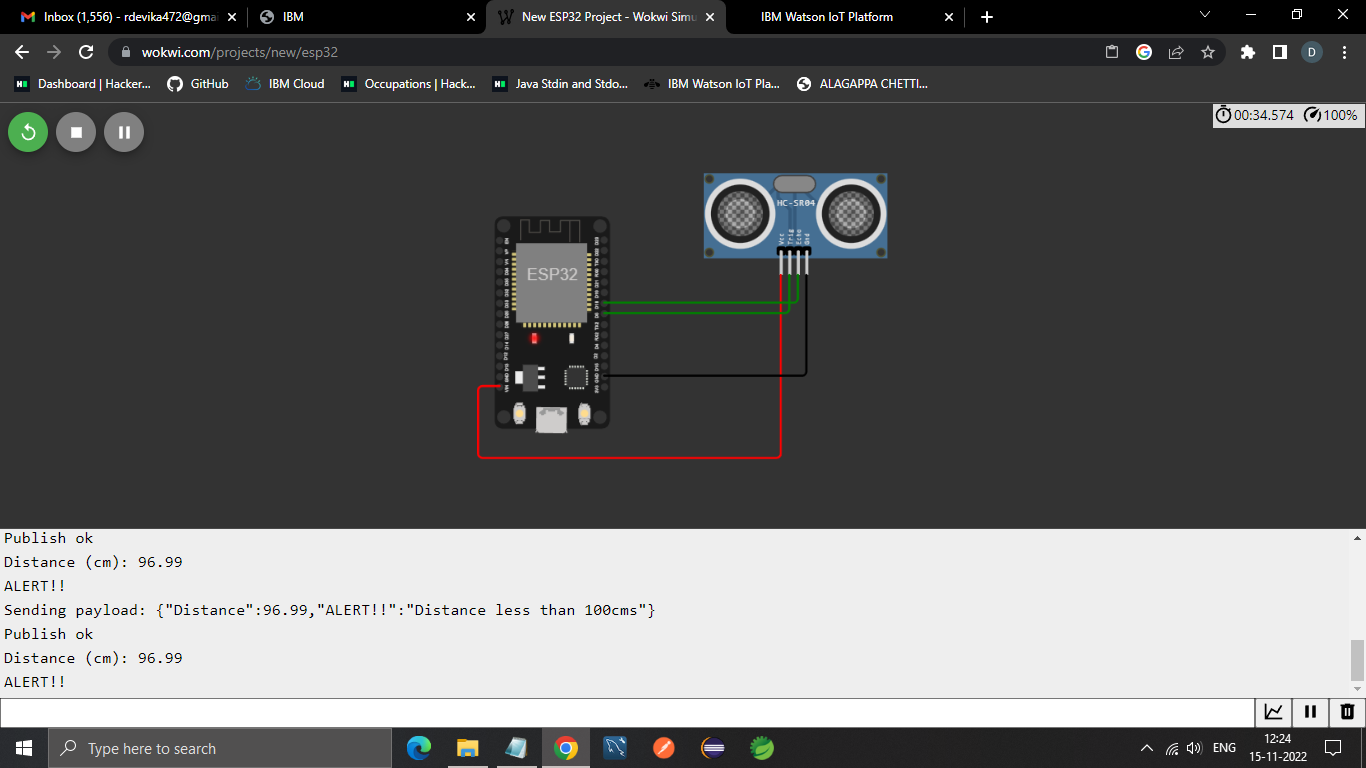
[ "ultrasonic1:TRIG", "esp:D5", "green", [ "v0" ] ],

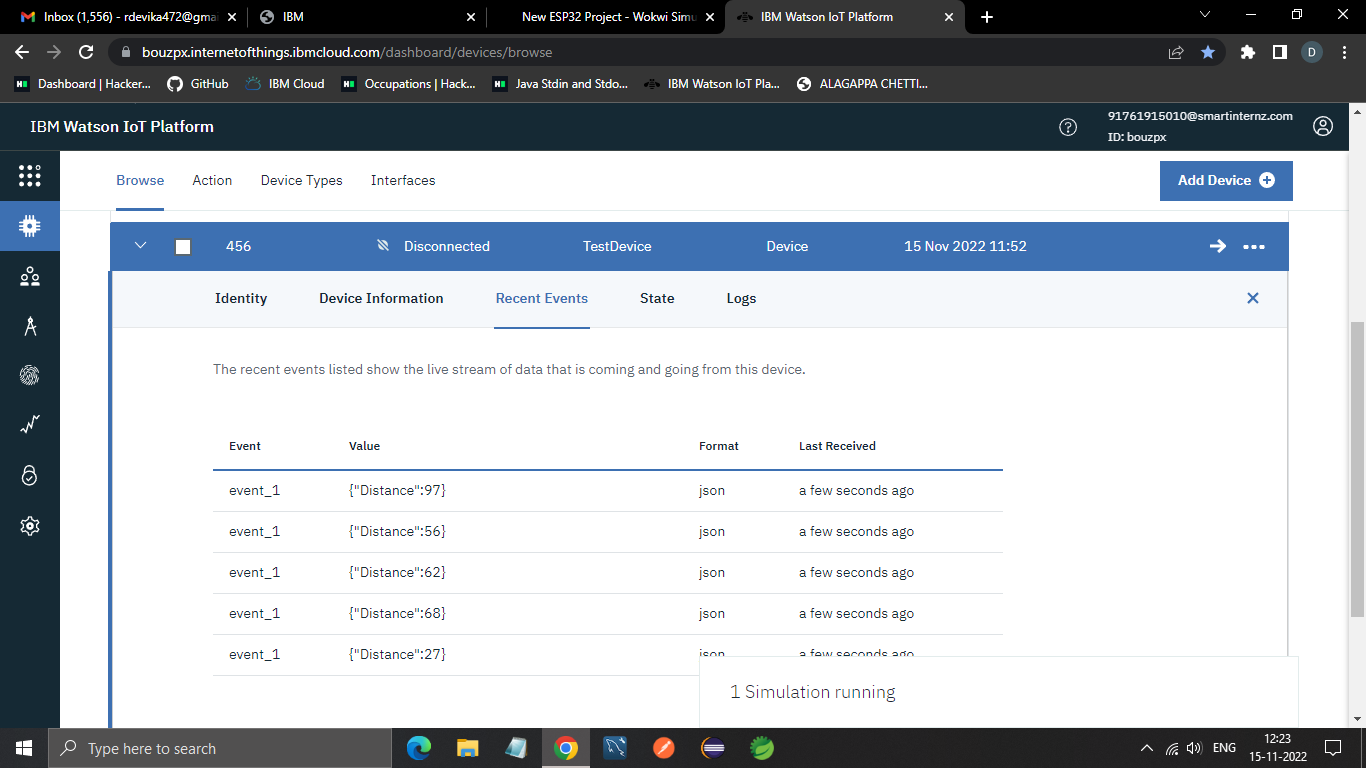
[ "ultrasonic1:ECHO", "esp:D18", "green", [ "v0" ] ]

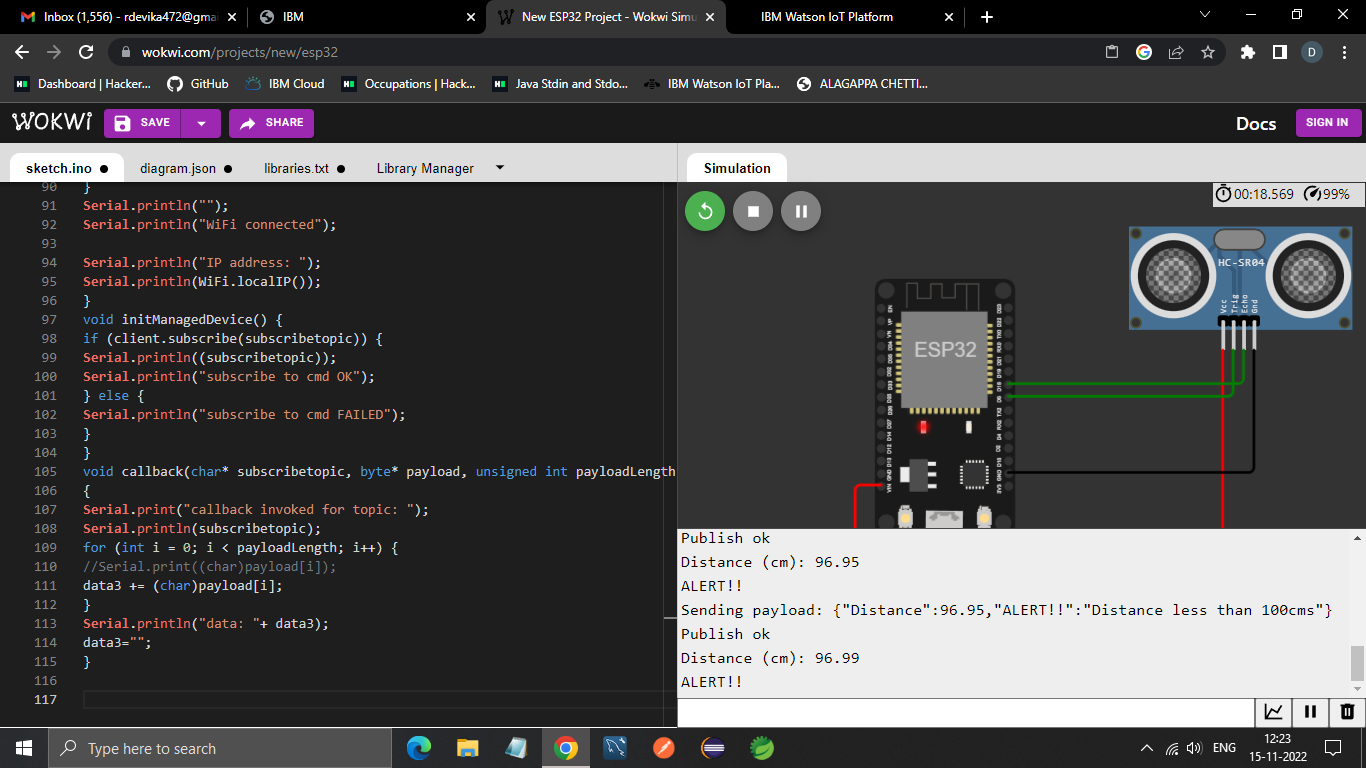
]

}

**Screenshots**







**Wokwi Link**

https://wokwi.com/projects/348375275707302483