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PROJECT	IoT Based Safety Gadget for Child Safety Monitoring and Notification
MARK	2 MARK

ASSIGNMENT 4

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.

Code:

```
#include <WiFi.h>
#include
<PubSubClient.h>
void callback(char* subscribetopic, byte* payload, unsigned int payloadLength);
//-------credentials of IBM Accounts------
#define ORG "ge3f42"//IBM ORGANITION ID
#define DEVICE_TYPE "ESP32"//Device type mentioned in ibm watson IOT Platform
#define DEVICE_ID "3A-85-DD-94-7D-BC"//Device ID mentioned in ibm watson
IOT Platform #define TOKEN "sPNIlvo1-SQoK4Dhx8" //Token
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(100); PublishData(distance); delay(100);
if (!client.loop()) {
mqttconnect();
}
}
delay(100);
}
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(100);
} initManagedDevice(); Serial.println();
}
}

void wificonnect()
{ Serial.println(); Serial.print("Connecting to "); WiFi.begin("Wokwi-GUEST", "", 6);
while (WiFi.status() != WL_CONNECTED) {
delay(100);
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": "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"]

],

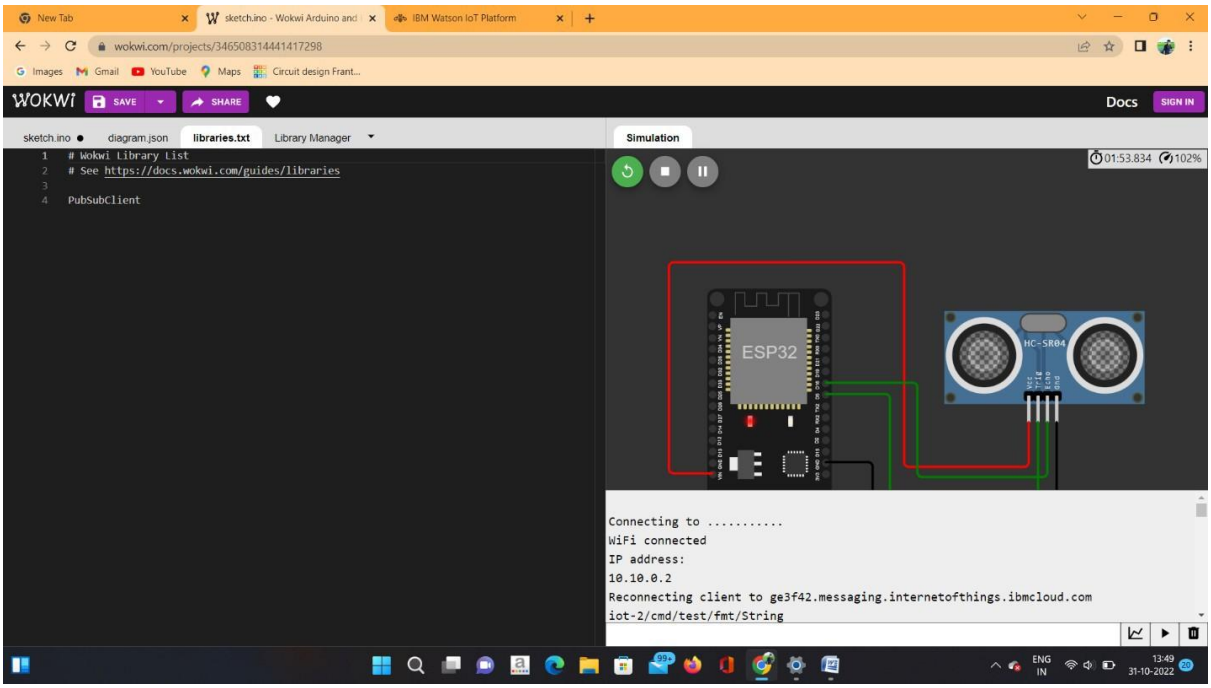
["esp:GND.1", "ultrasonic1:GND", "black", ["h39.87", "v44.04", "h170"]], ["esp:D5",

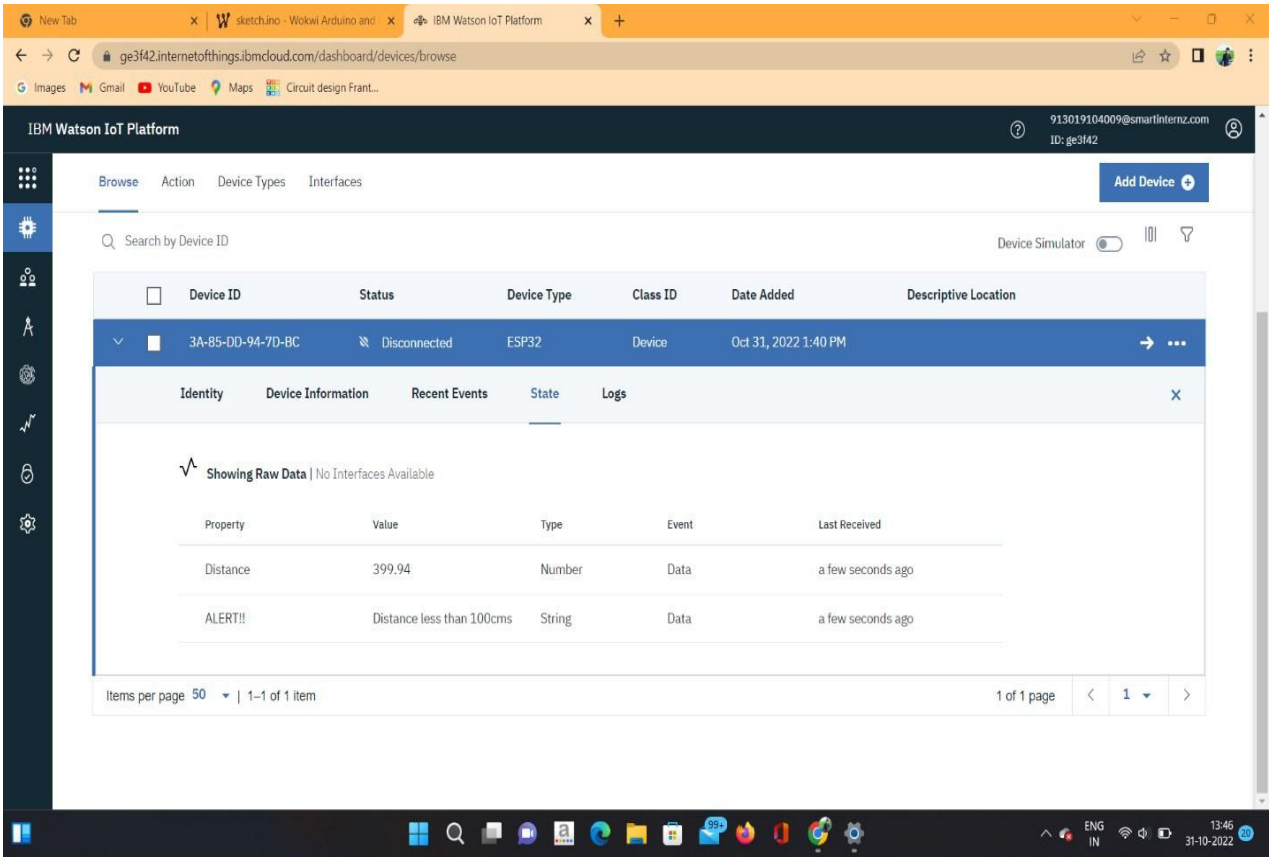
"ultrasonic1:TRIG", "green", ["h54.54", "v85.07", "h130.67"]

],

["esp:D18", "ultrasonic1:ECHO", "green", ["h77.87", "v80.01", "h110"]]

OUTPUT:





CIRCUIT DIAGRAM: