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PROJECT NAME	FIRE MANAGEMENT
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>#in
clude<PubSubClient.
h>
voidcallback(char*subscribetopic,byte*payload,unsig
nedintpayloadLength);
//-------credentialsofIBMAccounts------
#defineORG"ge3f42"//IBMORGANITIONID
#defineDEVICE_TYPE"ESP32"//DevicetypementionedinibmwatsonIOTPlatform
#defineDEVICE_ID"3A-85-DD-94-7D-
BC"//DeviceIDmentionedinibmwatsonIOTPlatform#defineTOKEN"sPNIlvo1-
SQoK4Dhx8"//Token
Stringdata3;
charserver[]=ORG".messaging.internetofthings.ibmclo
ud.com";charpublishTopic[]="iot-
2/evt/Data/fmt/json";
charsubscribetopic[]="iot-
2/cmd/test/fmt/String";charauthMethod[]="u
se-token-auth";
chartoken[]=TOKEN;
charclientId[]="d:"ORG":"DEVICE_TYPE":"DEVICE_ID;
WiFiClientwifiClient;
PubSubClient
client(server,1883,callback,wifiClient);con
stinttrigPin=5;
const
```

```
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();
}
}
```

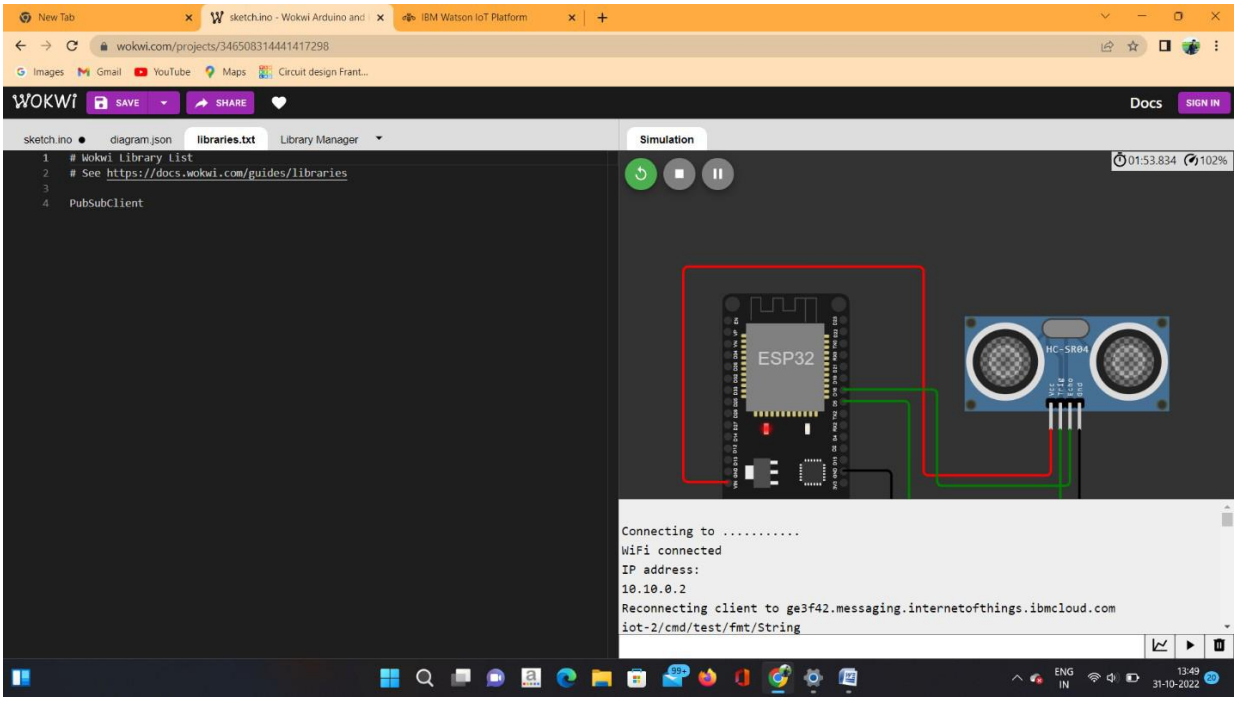
```
void wificonnect()
{
Serial.println();
Serial.print("Connecting to ");
WiFi.begin("Wokwi-GUEST", "",
6);
while (WiFi.status() != WL_CONNECTED) {
delay(100);
Serial.print(".");
}
Serial.println("");
Serial.println("WiFi
connected"); Serial.println("IP
address: ");
Serial.println(WiFi.localIP());
}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

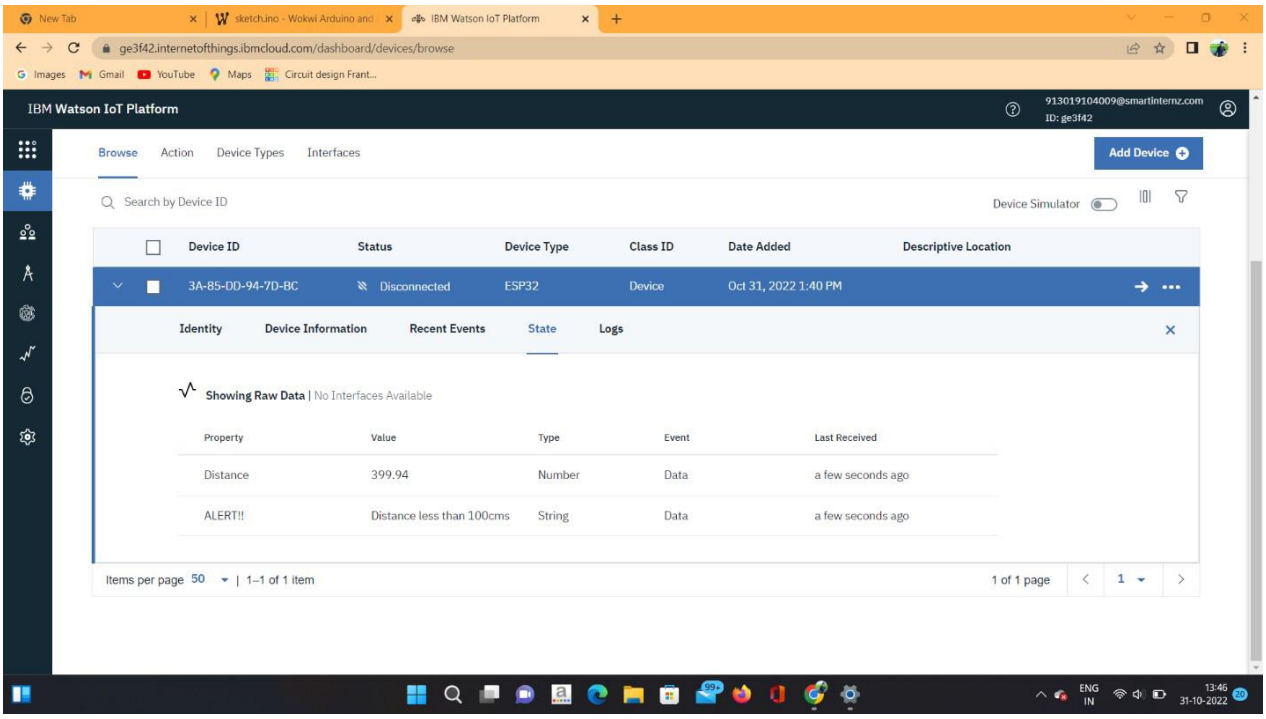
DIAGRAM.JSON

```
{
  "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","ultr
    asonic1:VCC","r
    ed",
    ["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 :