ASSIGNMENT 4

DATE	**30 OCTOBER 2022**
TEAMID	**PNT2022TMID39307**
ROLLNO	**422619104031**

Write code and connections in wowki for ultrasonic sensor. Whenever distance is less than 100cms send “alert” to IBM cloud and display in 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 "kotoq5"//IBM ORGANITION ID
#define DEVICE_TYPE "ESP32"//Device type mentioned in ibm watson IOT Platform #define
DEVICE_ID
"12345"//Device ID mentioned in ibm watson IOT Platform #define TOKEN "12345678" //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(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="";
    }
```

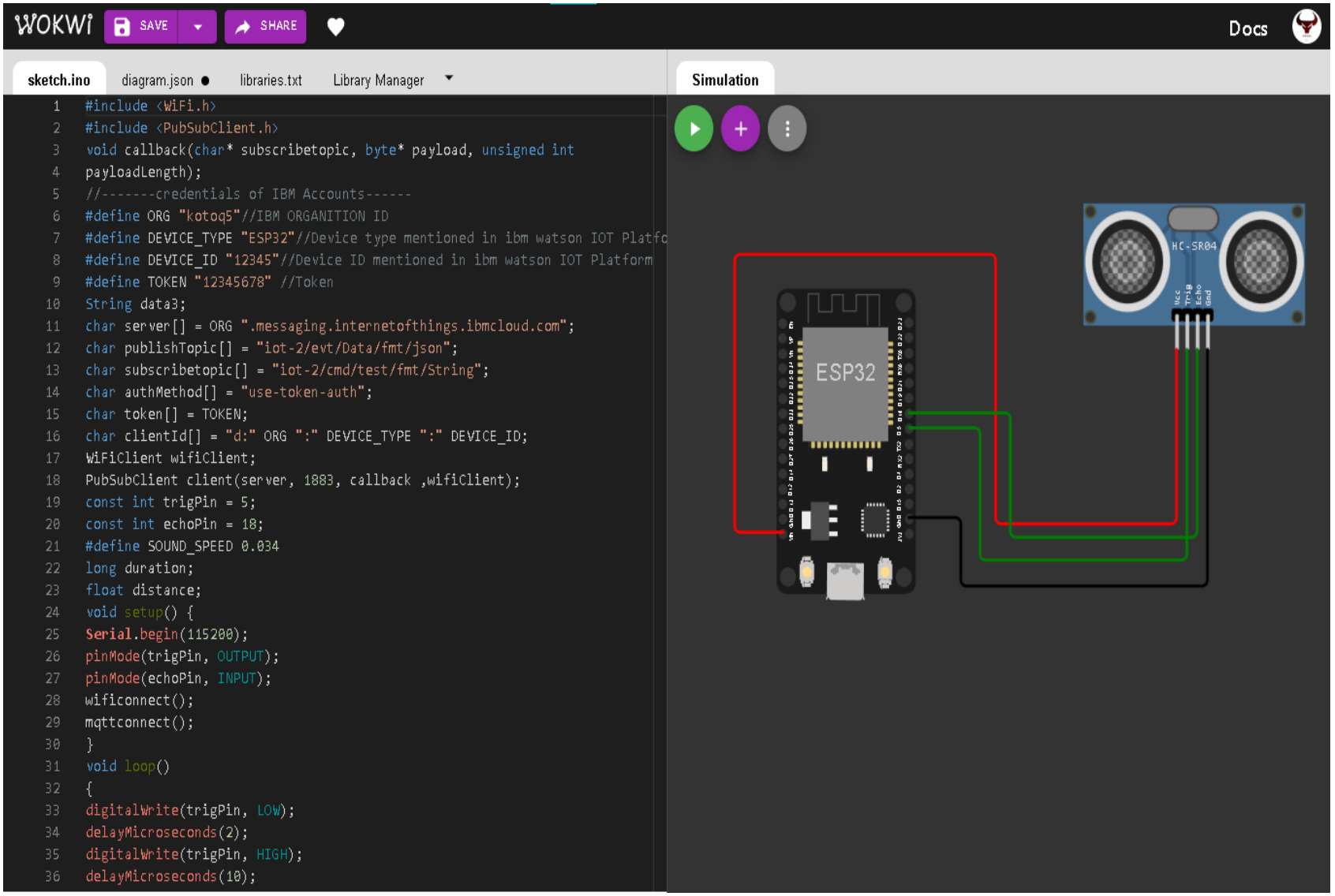
Diagram.json:

```
{
  "version": 1,
  "author": "sweetysharon",
```

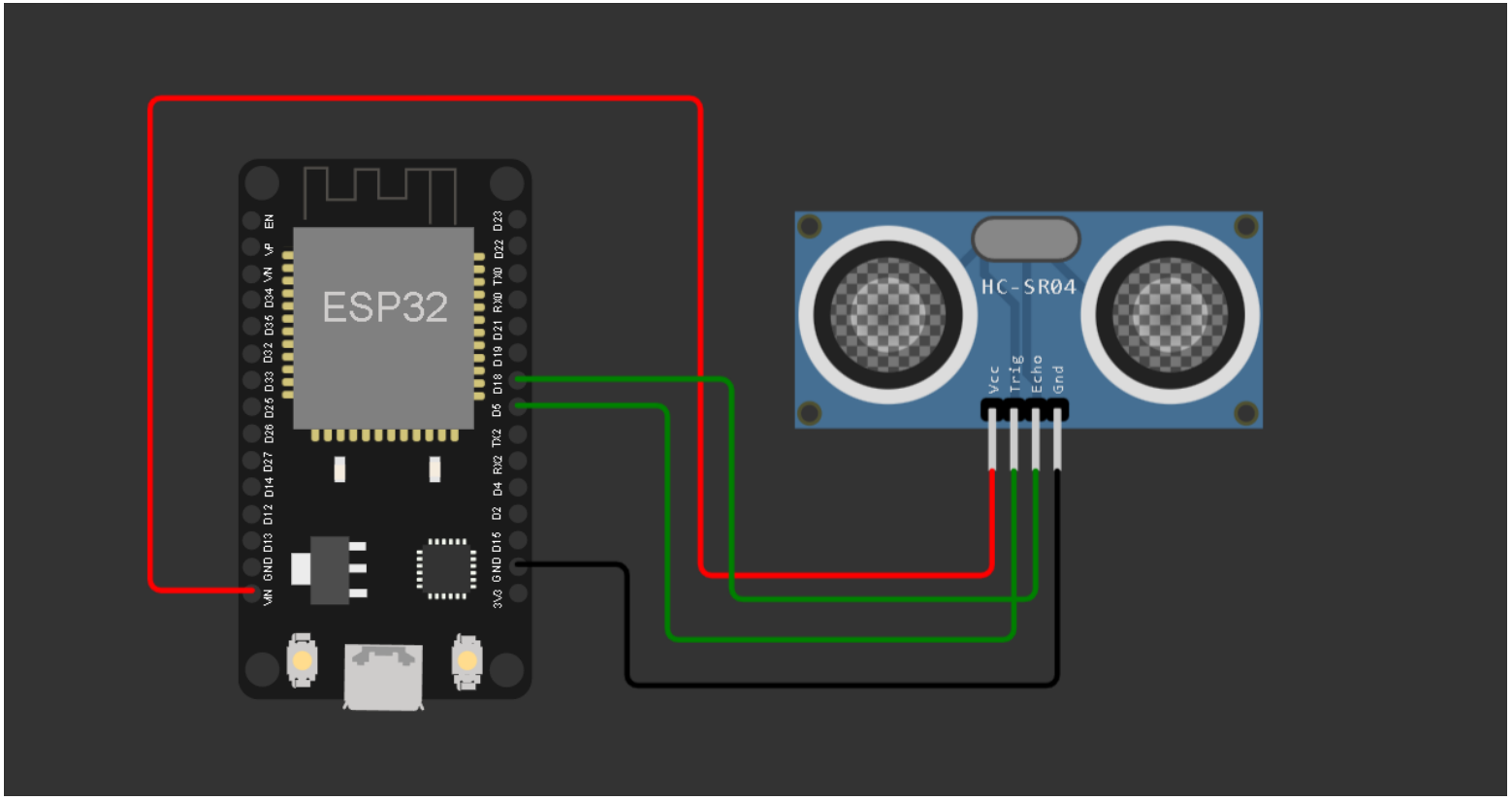
```
  "editor": "wokwi",
  "parts": [
    { "type": "wokwi-esp32-devkit-v1", "id": "esp", "top": -4.67, "left": -114.67, "attrs": {}
    }, { "type": "wokwi-hc-sr04", "id": "ultrasonic1", "top": 15.96, "left": 89.17, "attrs": {}
    }
  ],
  "connections": [
    [ "esp:TX0", "$serialMonitor:RX", "", [] ],
    [ "esp:RX0", "$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" ] ]

  ]
}
```

Circuit Diagram:




```
#include <WiFi.h>
#include <PubSubClient.h>
void callback(char* subscribetopic, byte* payload, unsigned int
payloadLength);
//-------credentials of IBM Accounts------
#define ORG "kotoq5"//IBM ORGANITION ID
#define DEVICE_TYPE "ESP32"//Device type mentioned in ibm watson IOT Platfo
#define DEVICE_ID "12345"//Device ID mentioned in ibm watson IOT Platform
#define TOKEN "12345678" //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);
```


ESP32
HC-SR04
Vcc
Trig
Echo
Gnd

Output:

Wokwi output:

```
Connecting to ....
WiFi connected
IP address:
10.10.0.2
Reconnecting client to ytluse.messaging.internetofthings.ibmcloud.com
iot-2/cmd/test/fmt/String
subscribe to cmd OK

Distance (cm): 399.92
Distance (cm): 399.96
Distance (cm): 399.94
Distance (cm): 399.98
Distance (cm): 399.94
Distance (cm): 399.92
Distance (cm): 399.94
```

IBM cloud output: