ASSIGNMENT 4

Ultrasonic sensor simulation in Wokwi

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Project Name	SIGNS WITH SMART CONNECTIVITY FOR BETTER ROAD SAFETY
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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
"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="";
      }
```

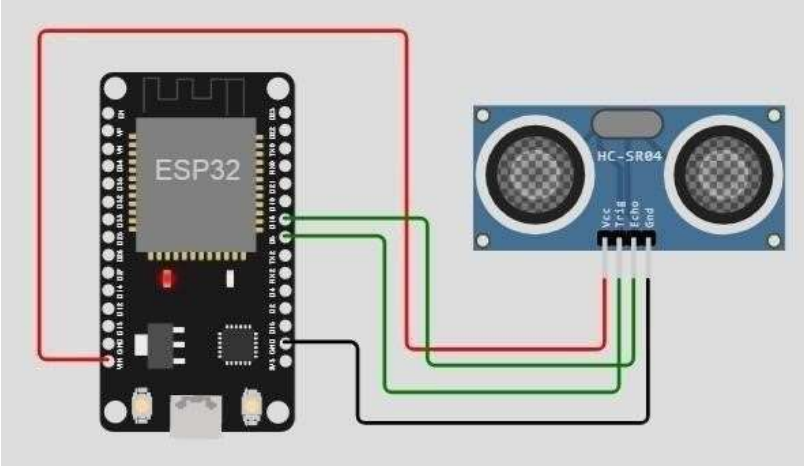
Diagram.json:

```
{
  "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" ] ]
  ]
}
```

Wokwi simulation link:

https://wokwi.com/projects/346508314441417298

Circuit Diagram:



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: