ASSIGNMENT - 4

ULTRASONIC SENSOR SIMULATION IN WOKWI

Student Name	KAVIYA V
Student Roll Number	19EC041(MECR19EC041)
Maximum Marks	2 Marks

QUESTION-1:

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 intpayloadLength);
//-------credentials of IBM Accounts------
#define ORG "ytluse"
#define DEVICE_TYPE "2702"
#define DEVICE_ID "12345"
#define TOKEN "O+n)Eh+lNX0y3?rG!8"
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:

```json
{
    "version": 1,
    "author": "KAVIYA V 19EC041",
    "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" ] ]
    ]
  }
```
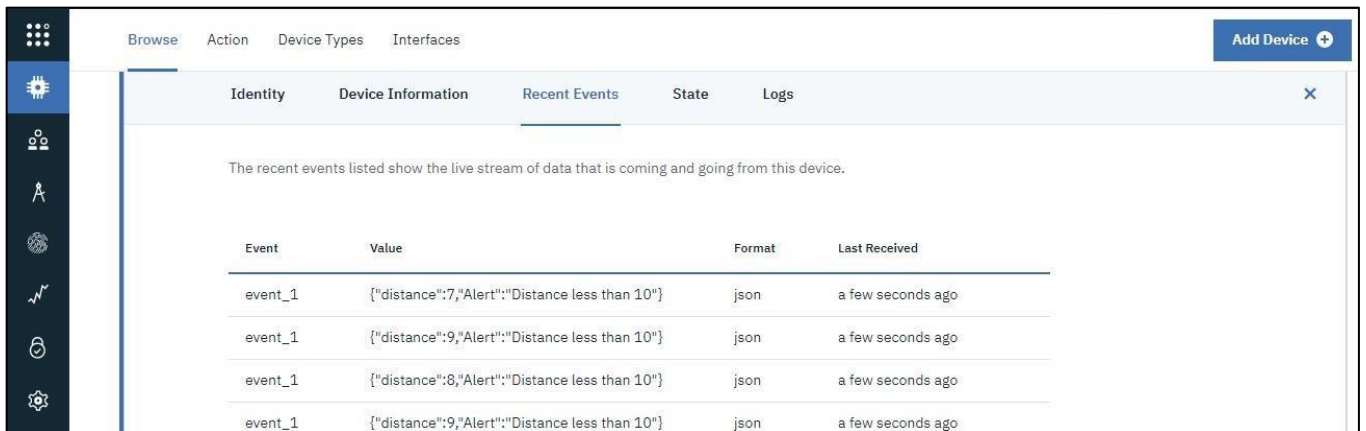
CIRCUIT DIAGRAM:
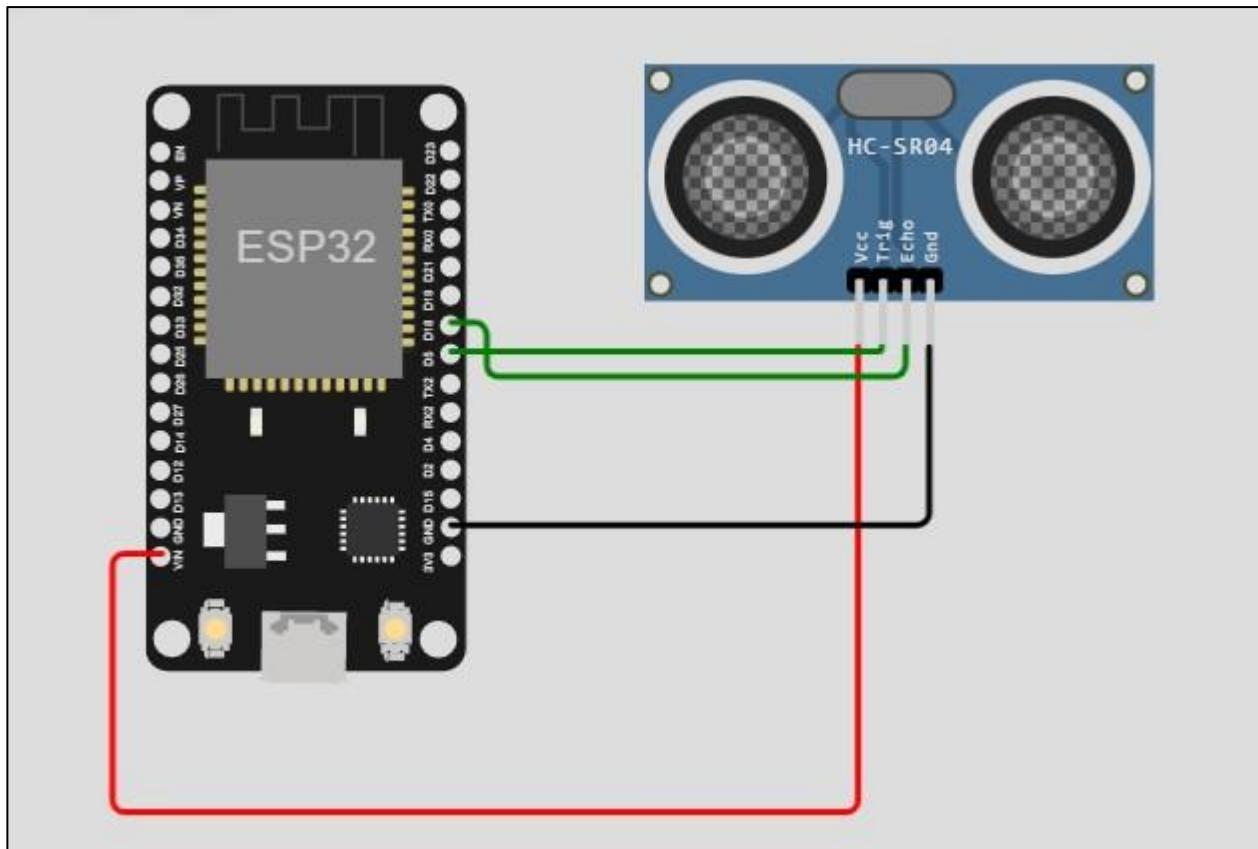
Circuit Diagram For Ultrasonic Sensor Simulation In Wokwi

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

Wokwi Output For Ultrasonic Sensor Simulation In Wokwi

IBM CLOUD OUTPUT:

IBM CLOUD OUTPUT

WOKWI SIMULATION LINK:

https://wokwi.com/projects/346425661051634259