Assignment Date	27 OCT 2022
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Project Title	Industry Specific Intelligent Fire Management System
Maximum Marks	2 Marks

ASSIGNMENT 4

Write code and connections in wokwi for the ultrasonic sensor. Whenever the distance is less than 100 cms send an "alert" to the IBM cloud and display in the device recent events. Upload document with wokwi share link and images of IBM cloud.

```cpp
#include <WiFi.h>
#include <PubSubClient.h>
WiFiClient wifiClient;
String data3;
#define ORG "xkw4zg"
#define DEVICE_TYPE "Ishwarya"
#define DEVICE_ID "Ishwarya123"
#define TOKEN "123456789"
#define speed 0.034
#define led 14
char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
char publishTopic[] = "iot-2/evt/Ishwarya/fmt/json";
char topic[] = "iot-2/cmd/home/fmt/String";
char authMethod[] = "use-token-auth";
char token[] = TOKEN;
char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;
PubSubClient client(server, 1883, wifiClient);
void publishData();


const int trigpin=5;
const int echopin=18;
String command;
String data="";

long duration;
float dist;
```

```cpp
void setup()
{
  Serial.begin(115200);
  pinMode(led, OUTPUT);
  pinMode(trigpin, OUTPUT);
  pinMode(echopin, INPUT);
  wifiConnect();
  mqttConnect();
}

void loop() {
  bool isNearby = dist < 100;
  digitalWrite(led, isNearby);

  publishData();
  delay(500);

  if (!client.loop()) {
    mqttConnect();
  }
}

void wifiConnect() {
  Serial.print("Connecting to "); Serial.print("Wifi");
  WiFi.begin("Wokwi-GUEST", "", 6);
  while (WiFi.status() != WL_CONNECTED) {
    delay(500);
    Serial.print(".");
  }
  Serial.print("WiFi connected, IP address: "); Serial.println(WiFi.localIP());
}

void mqttConnect() {
  if (!client.connected()) {
    Serial.print("Reconnecting MQTT client to "); Serial.println(server);
    while (!client.connect(clientId, authMethod, token)) {
      Serial.print(".");
```

```cpp
      delay(500);
    }
    initManagedDevice();
    Serial.println();
  }
}

void initManagedDevice() {
  if (client.subscribe(topic)) {
    // Serial.println(client.subscribe(topic));
    Serial.println("IBM subscribe to cmd OK");
  } else {
    Serial.println("subscribe to cmd FAILED");
  }
}
void publishData()
{
  digitalWrite(trigpin,LOW);
  digitalWrite(trigpin,HIGH);
  delayMicroseconds(10);
  digitalWrite(trigpin,LOW);
  duration=pulseIn(echopin,HIGH);
  dist=duration*speed/2;
  if(dist<100){
   String payload = "{\"Alert Distance\":";
   payload += dist;
   payload += "}";

   Serial.print("\n");
   Serial.print("Sending payload: ");
   Serial.println(payload);
    if(client.publish(publishTopic, (char*) payload.c_str())) {
    Serial.println("Warning crosses 110cm -- it automaticaly of the loop");
    digitalWrite(led,HIGH);
   }

  }
   if(dist>101 && dist<111){
   String payload = "{\"Normal Distance\":";
   payload += dist;
```

```
    payload += "}";

  Serial.print("\n");
  Serial.print("Sending payload: ");
  Serial.println(payload);


  }


}




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++){
  dist += (char)payload[i];
}
Serial.println("data:"+ data3);
if(data3=="lighton"){
  Serial.println(data3);
  digitalWrite(led,HIGH);
 }
 data3="";
}
```
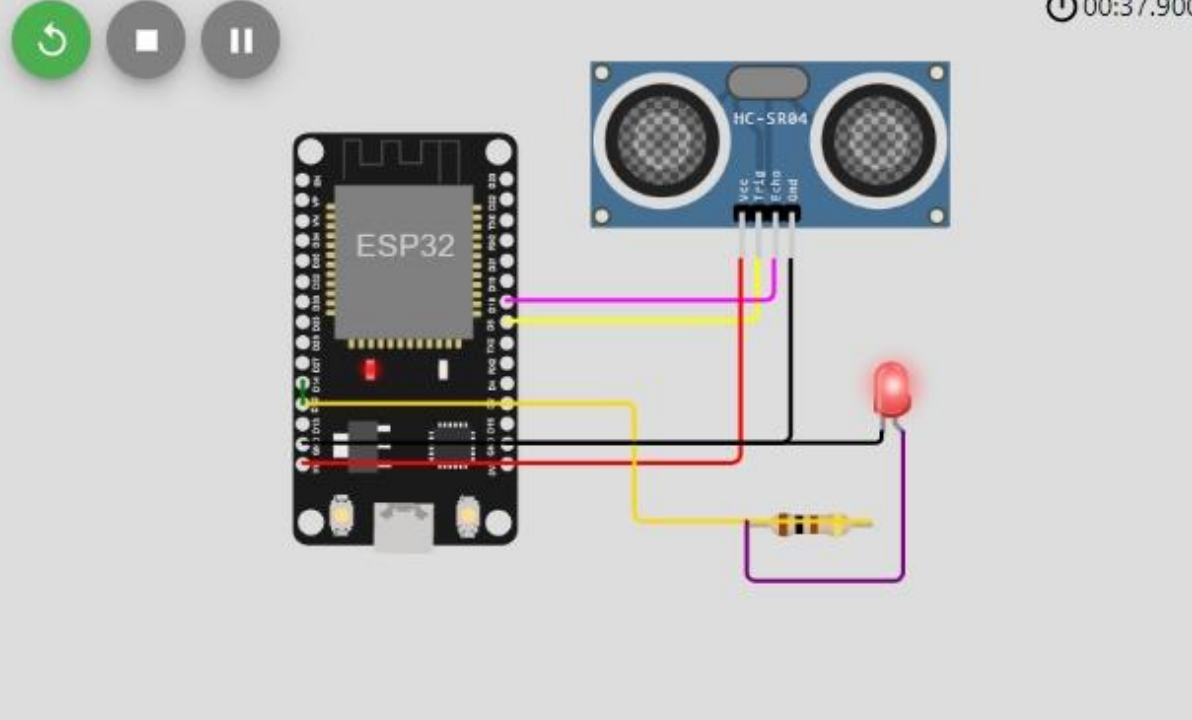
OUTPUT

When the distance is less than 100cm alert message will appear in the IBM cloud.

```
Simulation                                          00:37.900

                                   HC-SR04
                    ESP32


Warning crosses 110cm -- it automaticaly of the loop

Sending payload: {"Alert Distance":59.02}
Warning crosses 110cm -- it automaticaly of the loop

Sending payload: {"Alert Distance":58.97}
Warning crosses 110cm -- it automaticaly of the loop
```

While Distance is greater than 100cm there is no alert message in the IBM cloud.

Simulation

⏱ 00:04.594 🎯99%

Connecting to Wifi....WiFi connected, IP address: 10.10.0.2
Reconnecting MQTT client to xkw4zg.messaging.internetofthings.ibmcloud.com
IBM subscribe to cmd OK

⌄	☐	Ishwarya123	⊠ Disconnected	Ishwarya	Device

Identity	Device Information	Recent Events	State	Logs

Device ID   Ishwarya123

Device Type   Ishwarya

Date Added   Oct 28, 2022 7:31 AM

Added By   ishkutty0106@gmail.com

Connection Status **Disconnected**
Last Connected: Oct 28, 2022 7:35 PM
Client Address: 216.246.119.61 Insecure
Duration: a few seconds
Data Transferred: 686 B

Items per page 50 ▾ | 1–1 of 1 item

IBM CLOUD OUTPUT

Ishwarya123	● Connected	Ishwarya	Device	Oct 28, 2022 7:31 AM

Identity	Device Information	Recent Events	State	Logs

The recent events listed show the live stream of data that is coming and going from this device.

Event	Value	Format	Last Received
Ishwarya	{"Alert Distance":58.99}	json	a few seconds ago
Ishwarya	{"Alert Distance":58.99}	json	a few seconds ago
Ishwarya	{"Alert Distance":58.99}	json	a few seconds ago
Ishwarya	{"Alert Distance":86.99}	json	a few seconds ago
Ishwarya	{"Alert Distance":89.96}	json	a few seconds ago

https://wokwi.com/projects/346751298855502419