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| Assignment Date | 28 October 2022 |
| Student Name | R.Kabilan |
| Team ID | PNT2022TMID46724 |
| Project Name | SmartFarmer - IoT Enabled Smart Farming Application |
| 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.

SOURCE CODE

```
#include <WiFi.h>
#include <PubSubClient.h>
WiFiClient wifiClient;
String data3;
#define ORG "q9u3me"
#define DEVICE_TYPE "kabilan"
#define DEVICE_ID "kabilanramesh"
#define TOKEN "Ori8ly"
#define speed 0.034
#define led 14
char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
char publishTopic[] = "iot-2/evt/Kabilan/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;
```

```

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(".");
            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 automatically 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);

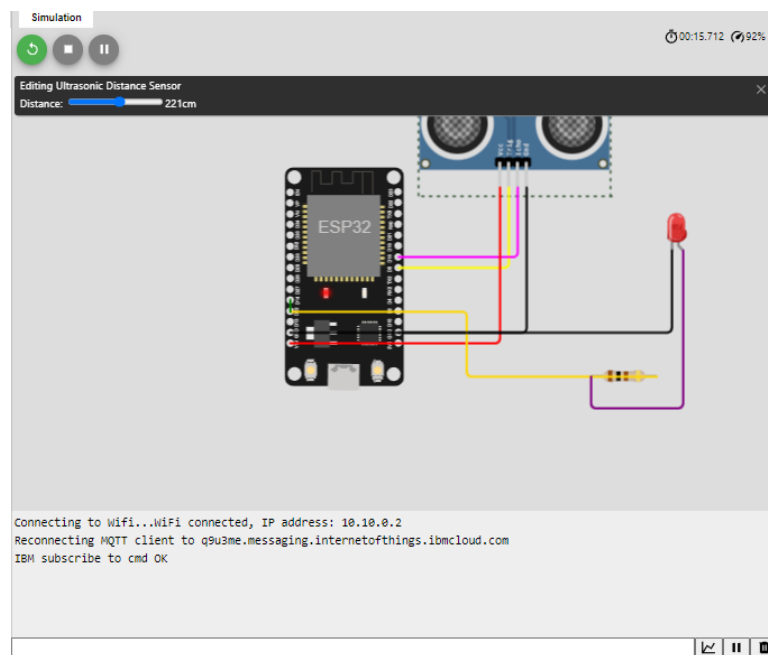
  }
}

```

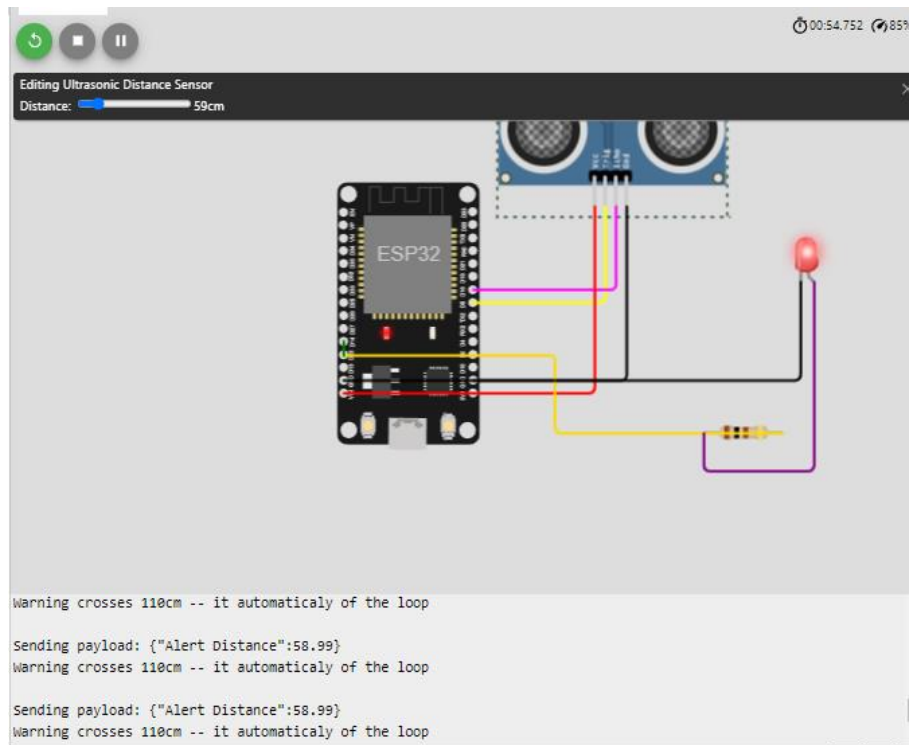
```
}
```

```
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



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



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

IBM Cloud Output

| kabilanramesh | | Connected | kabilan | Device |
|-------------------|---|---------------|---------|--------|
| Identity | Device Information | Recent Events | State | Logs |
| Device ID | kabilanramesh | | | |
| Device Type | kabilan | | | |
| Date Added | 28 Oct 2022 22:21 | | | |
| Added By | kabilanking1017@gmail.com | | | |
| Connection Status | Connected Connection Time: 28 Oct 2022 22:28 Client Address: 145.40.94.93 Insecure | | | |

| 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 |
|---------|--------------------------|--------|-------------------|
| kabilan | {"Alert Distance":82.94} | json | a few seconds ago |
| kabilan | {"Alert Distance":82.94} | json | a few seconds ago |
| kabilan | {"Alert Distance":93.99} | json | a few seconds ago |

<https://wokwi.com/projects/346782262139814482>