

ASSIGNMENT-4

DISTANCE DETECTION USING ULTRASONIC SENSOR

Date	28 October 2022
Team ID	PNT2022TMID17772
Name	Venkatesh.K
Student Roll Number	713319EC124
Maximum Marks	2 Marks

Question:

Write code and connections in wokwi for ultrasonic sensor. Whenever distance is less than 100 centimeters it should send "alert" to IBM cloud and display in device recent events

Code:

```
#include <WiFi.h>
#include <PubSubClient.h>
#include <ArduinoJson.h>
```

```
WiFiClient wifiClient;
```

```
#define ORG "mb5cgm"
#define DEVICE_TYPE "NodeMCU"
#define DEVICE_ID "12345"
#define TOKEN "12345678"
#define speed 0.034
```

```
char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
char publishTopic[] = "iot-2/evt/status1/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=19;  
String command;  
String data="";  
String name="Alert";  
String icon=""; long  
duration; int dist;  
void setup()  
{  
  Serial.begin(115200);  
  pinMode(trigpin, OUTPUT);  
  pinMode(echopin, INPUT);  
  wifiConnect();  
  mqttConnect();  
} void loop() {  
  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(".");  
    Serial.print("*");  
    delay(1000);  
  }  
  initManagedDevice();  
  Serial.println();  
}
```

```

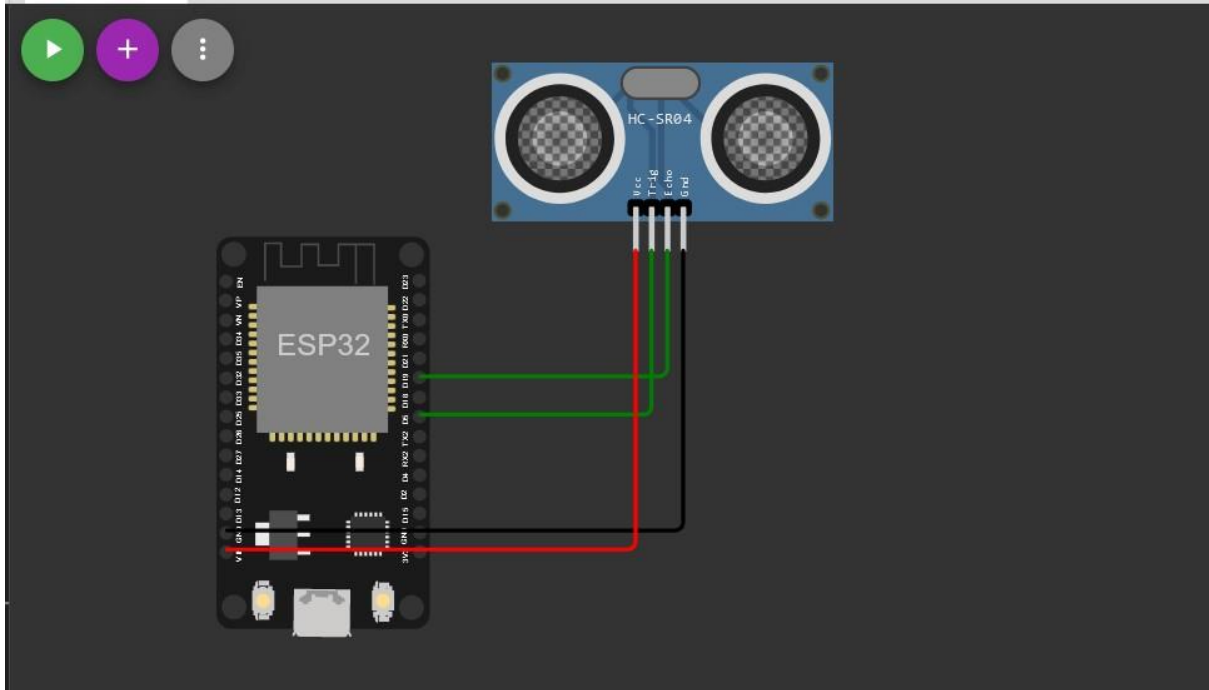
    }
}

void initManagedDevice() {
    if (client.subscribe(topic)) {
        Serial.println(client.subscribe(topic));
        Serial.println("subscribe to cmd OK");
    }
    else {
        Serial.println("subscribe to cmd FAILED");
    }
}

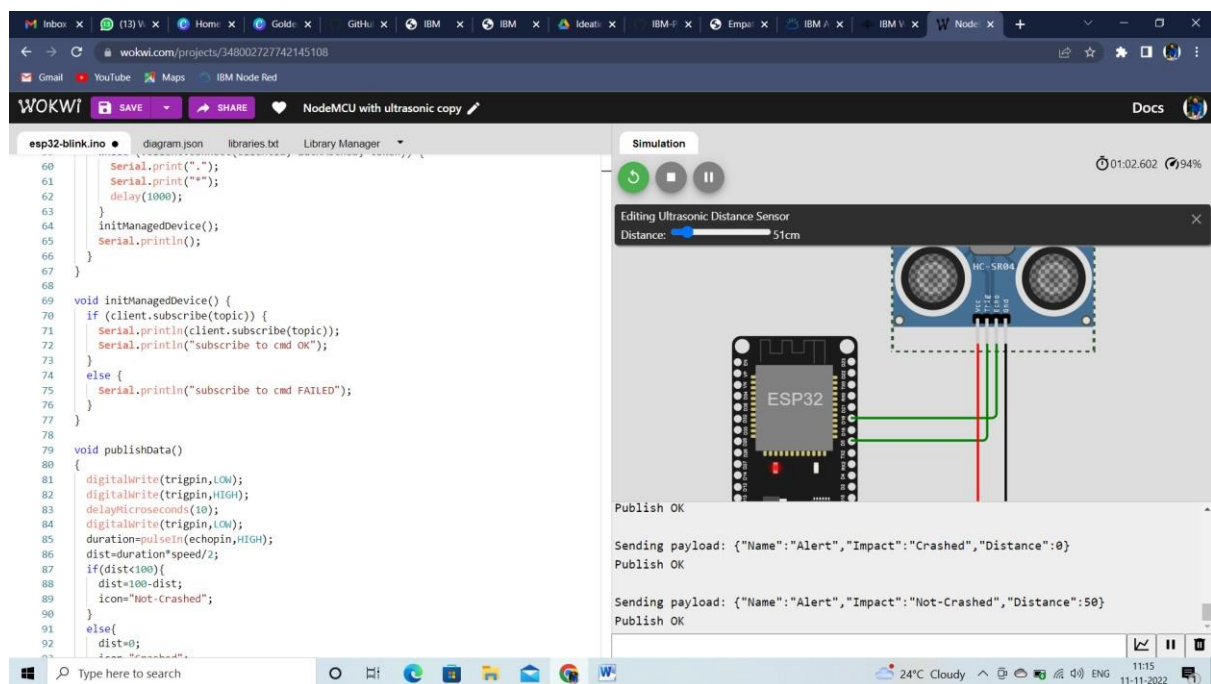
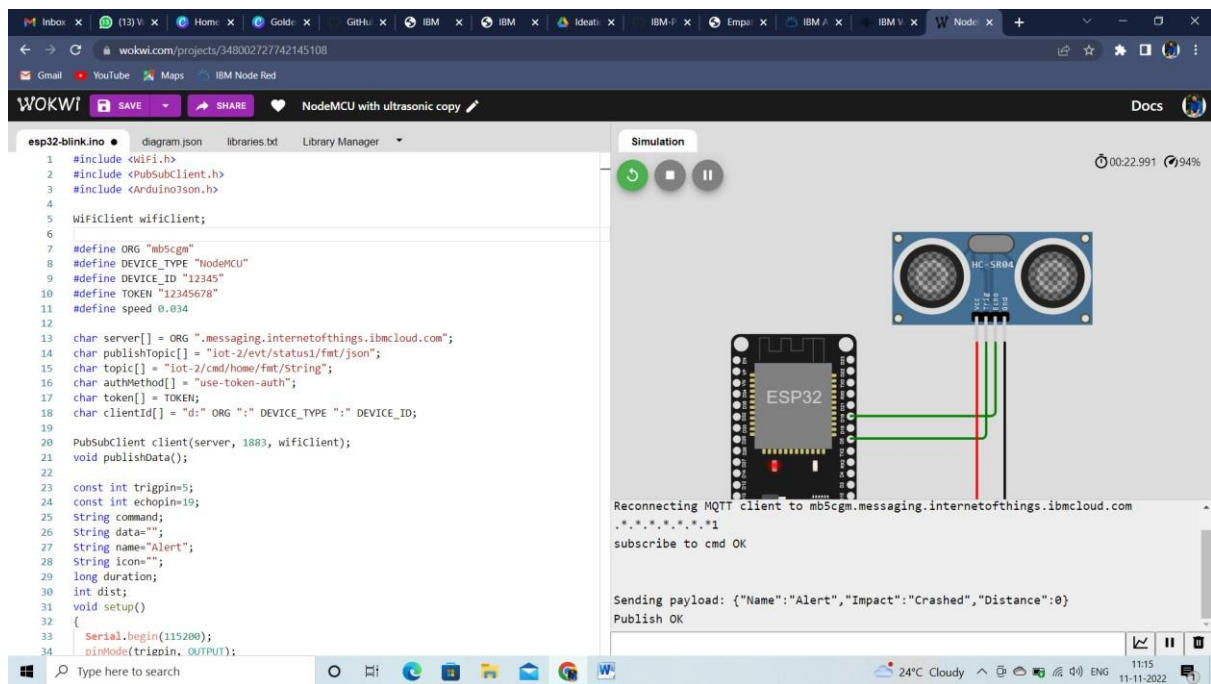
void publishData()
{
    digitalWrite(trigpin,LOW);
    digitalWrite(trigpin,HIGH);
    delayMicroseconds(10);
    digitalWrite(trigpin,LOW);
    duration=pulseIn(echopin,HIGH);
    dist=duration*speed/2;
    if(dist<100){    dist=100-dist;
        icon="Not-Crashed";
    }
    else{
        dist=0;
        icon="Crashed";
    }
    DynamicJsonDocument doc(1024);
    String payload;
    doc["Name"]=name;
    doc["Impact"]=icon;
    doc["Distance"]=dist;
    serializeJson(doc, payload);
    delay(3000); Serial.print("\n");
    Serial.print("Sending payload: ");
    Serial.println(payload);
    if (client.publish(publishTopic, (char*) payload.c_str())) {
        Serial.println("Publish OK");
    }
    else {
        Serial.println("Publish FAILED");
    }
}

```

DIAGRAM:



OUTPUT:



Data uploaded to Iot Watson Platform

mb5cgm.internetofthings.ibmcloud.com/dashboard/devices/browse

IBM Watson IoT Platform

viswajith1310@gmail.com
ID: mb5cgm

Browse Action Device Types Interfaces

Add Device +

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

Event	Value	Format	Last Received
status1	{"Name":"Alert","Impact":"Not-Crashed","Distan...	json	a few seconds ago
status1	{"Name":"Alert","Impact":"Not-Crashed","Distan...	json	a few seconds ago
status1	{"Name":"Alert","Impact":"Crashed","Distance":0}	json	a few seconds ago
status1	{"Name":"Alert","Impact":"Crashed","Distance":0}	json	a few seconds ago
status1	{"Name":"Alert","Impact":"Crashed","Distance":0}	json	a few seconds ago

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<https://wokwi.com/projects/348002727742145108>