ASSINGNMENT-IV

DISTANCE DETECTION USING ULTRASONIC SENSOR

Team Id	PNT2022TMID46638
Assignment date	29 Oct 2022
Project Name	Hazardous area monitoring for industrial plant powered by IOT
Maximum Marks	2 Marks

Question-1:

Write code and connections in wokwi for ultrasonic sensor. Whenever distance is less than 100

cms send "alert" to ibm cloud and display in device recent events.

CODE:

```
#include <WiFi.h>
#include <PubSubClient.h>
WiFiClient wifiClient;
String data3;
#define ORG "co65hn"
#define DEVICE_TYPE "ManiMD"
#define DEVICE_ID "manimd07"
#define TOKEN "0708012359"
#define speed 0.034
#define led 14
char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
char publishTopic[] = "iot-2/evt/manimd/fmt/json";
char topic[] = "iot-2/cmd/led/fmt/String";
char authMethod[] = "use-token-auth";
char token[] = TOKEN;
char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;
PubSubClient client(server, 1883, wifiClient);
```

```cpp
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);
    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);
```

```cpp
    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);
```

```cpp
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("Publish OK");
    }

}
    if(dist>100){
    String payload = "{\"Distance\":";
    payload += dist;
    payload += "}";
    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");
    }
}
  }
```
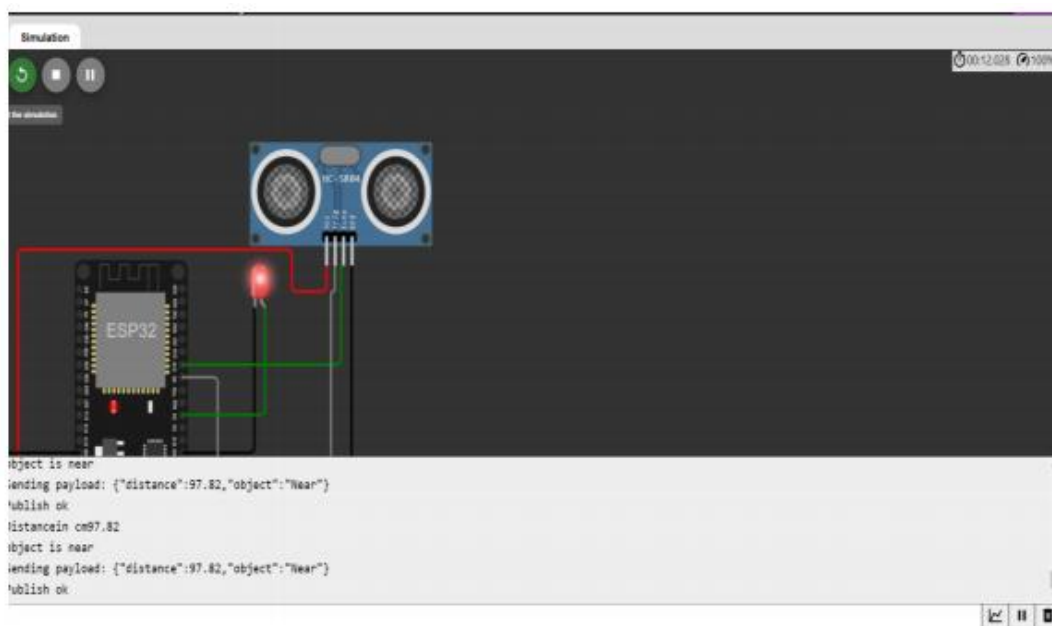
OUTPUT
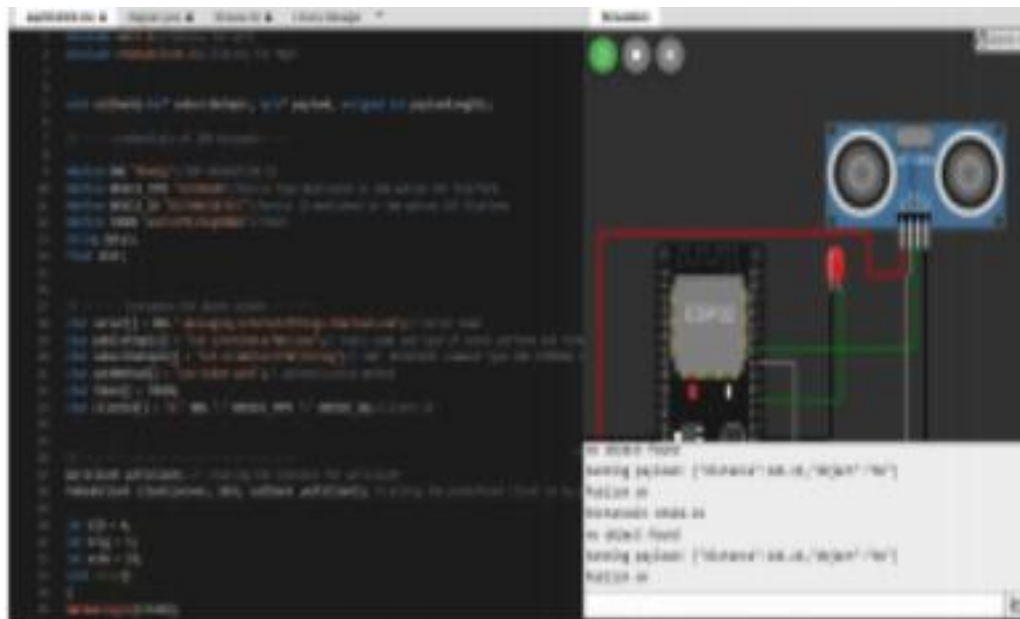
when object is near to the ultrasonic sensor

DISTANCEDETECT   Disconnected   ULTRASON   Device   Oct 20, 2022 9:46 AM

Identity   Device Information   Recent Events   State   Logs   X

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

Event	Value	Format	Last Received
Data	{"distance":79.66,"object":"Near"}	json	a few seconds ago
Data	{"distance":79.64,"object":"Near"}	json	a few seconds ago
Data	{"distance":79.66,"object":"Near"}	json	a few seconds ago
Data	{"distance":79.64,"object":"Near"}	json	a few seconds ago
Data	{"distance":79.66,"object":"Near"}	json	a few seconds ago