

Assignment -4

Assignment Date	17 November 2022
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Maximum Marks	2 Marks

Question-1:

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

Solution :

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

WiFiClient wifiClient;

#define ORG "nhpwjc"
#define DEVICE_TYPE "raspberrypi"
#define DEVICE_ID "12345"
#define TOKEN "123456789"
#define speed 0.034
char server[] = ORG
".messaging.internetofthings.ibmcloud.com"; char publishTopic[]
= "iot-2/evt/Data/fmt/json"; char topic[] = "iot-
2/cmd/home/fmt/String"; char authMethod[] = "use-tokenauth";
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;
int dist;

void setup()
{
  Serial.begin(115200);
  pinMode(trigpin, OUTPUT);
  pinMode(echopin, INPUT);
  wifiConnect(); mqttConnect();
} void
loop() {
  publishData(); delay(500);
```

```

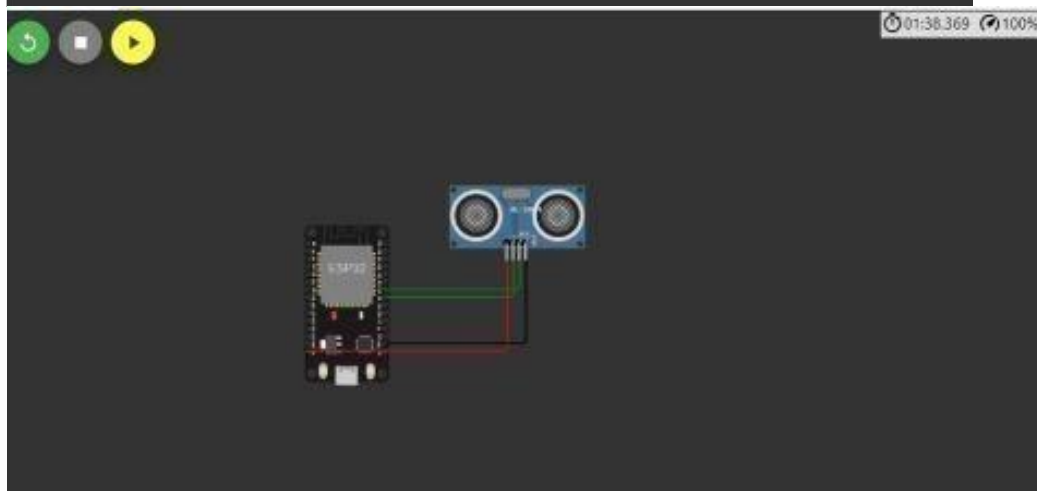
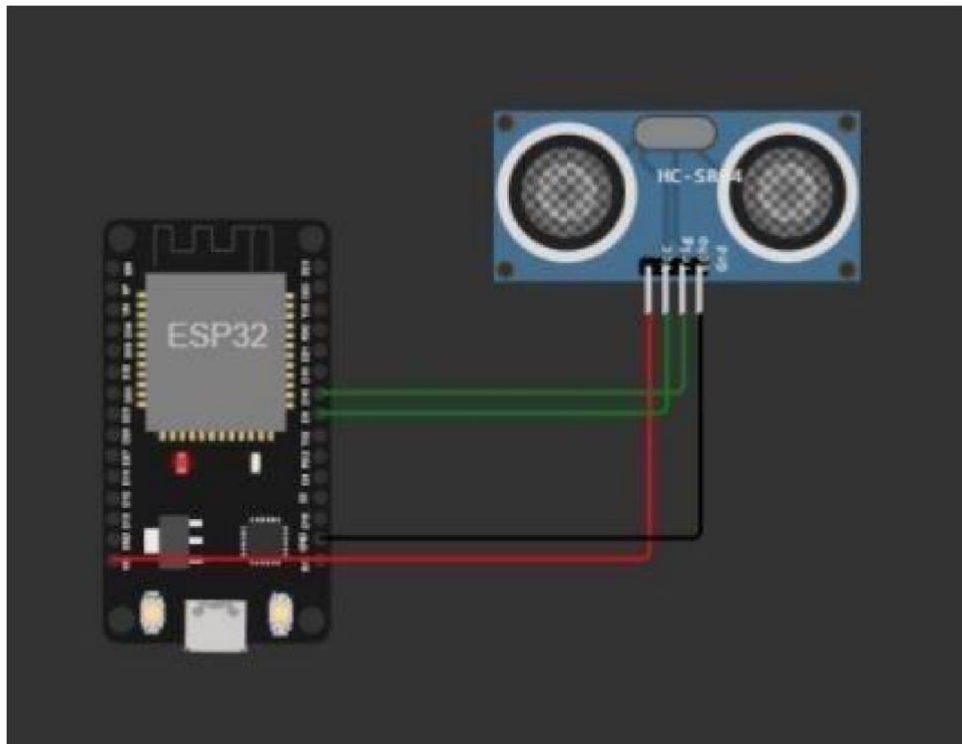
    if (!client.loop()) {
        mqttConnect();
    }
}

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("."); 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){
      DynamicJsonDocument doc(1024);
      String payload;
      doc["AlertDistance:"]=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");
      }
  }
}
}

```



```
ending payload: {"Alert distance":93.99}  
ublish OK
```

```
ending payload: {"Alert distance":93.96}  
ublish OK
```

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Add Device 

🔍 Search by Device ID

Device Simulator ☒

Device ID	Status	Device Type	Class ID	Date Added	Descriptive Location	Added By	Device Class	Firmware Version
12345	Connected	NodeMCU	Device	Oct 17, 2022 2:38 PM		111719106009@smartfirmz.com		

Identity	Device Information	Recent Events	State	Logs
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The recent events listed show the live stream of data that is coming and going from this device.

Event	Value	Format	Last Received
Data	("Alert distance":93.9%)	json	a few seconds ago
Data	("Alert distance":93.9%)	json	a few seconds ago
Data	("Alert distance":93.9%)	json	a few seconds ago
Data	("Alert distance":93.9%)	json	a few seconds ago
Data	("Alert distance":93.9%)	json	a few seconds ago