

Assignment-4

Assignment Date	25 October 2022
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Maximum Marks	2 Marks

Question-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

PROGRAM:

```
#include <WiFi.h>
#include <PubSubClient.h>
WiFiClient wifiClient;
String data3;
#define ORG "948e13"
#define DEVICE_TYPE "NodeMCU"
#define DEVICE_ID "502645"
#define TOKEN "F1eqrGOoNLATFjk?Sz"
#define speed 0.034

#define led 14

char server[] = ORG
".messaging.internetofthings.ibmcloud.com"; char
publishTopic[] = "iot-2/evt/shreedharen/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);

const int trigpin=5;
```

```
const int echopin=18;
```

```
Stringcommand;
```

```
String data="";
```

```
long duration;
```

```
floatdist;
```

```
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,LO
W);
    digitalWrite(trigpin,HIG
H);
    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("Publish OK");
    }

}
    if(dist>100){
        String payload = "{"Distance\":";
payload += dist; payload += "}";

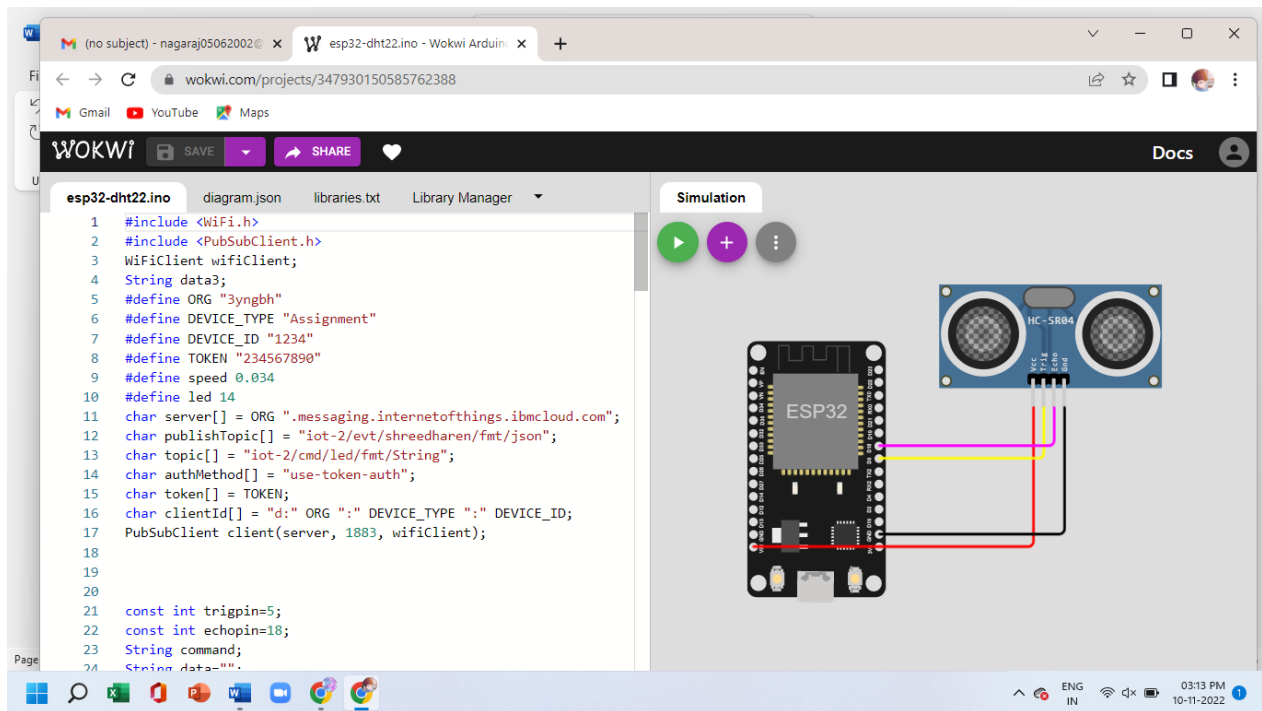
        Serial.print("\n");
        Serial.print("Sending payload:
");
Serial.println(payload);
                if(client.publish(publishT
opic,(char*) payload.c_str())) {
            Serial.println("Publish OK");
        }else {
            Serial.println("Publish FAILED");
        }

    }

}

```

Connection:



Output:

Output: (IBM Cloud)

The screenshot displays the IBM Watson IoT Platform interface in a Mozilla Firefox browser. The dashboard shows a list of devices under the 'Browse' tab. Two devices are listed: '502645' (Disconnected) and 'NodeMCU_1' (Connected). The 'NodeMCU_1' device is selected, and its details are shown in a modal window. The modal window has tabs for 'Identity', 'Device Information', 'Recent Events', 'State', and 'Logs'. The 'Recent Events' tab is active, showing a table of raw data. The table has columns for Property, Value, Type, Event, and Last Received. Three events are listed: 'randomNumber' (88), 'temp' (26), and 'hum' (96). All events are of type 'Number' and occurred at 'event_1' a few seconds ago. At the bottom of the modal, it says 'Showing Raw Data | No Interfaces Available'. Below the modal, there is a pagination bar showing 'Items per page 50' and '1-2 of 2 items'. A status message at the bottom right indicates '1 Simulation running'.

Property	Value	Type	Event	Last Received
randomNumber	88	Number	event_1	a few seconds ago
temp	26	Number	event_1	a few seconds ago
hum	96	Number	event_1	a few seconds ago

Link: <https://wokwi.com/projects/347930150585762388>