ASSIGNMENT – IV
TEAM ID: PNT2022TMID31482

Code:

```
#include <WiFi.h>
#include <PubSubClient.h>
WiFiClient wifiClient;
String data3;
#define ORG "4yi0vc"
#define DEVICE_TYPE "nodeMcu"
#define DEVICE_ID "Assignment4"
#define TOKEN "123456789"
#define speed 0.034  #define
led 14
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-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);
```

```cpp
  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("Reconnectin

g   MQTT   client   to   ");

Serial.println(server);

while

(!client.connect(clientId,

authMethod,   token))   {
```

```arduino
    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 = "{\"Normal 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");
    }
```
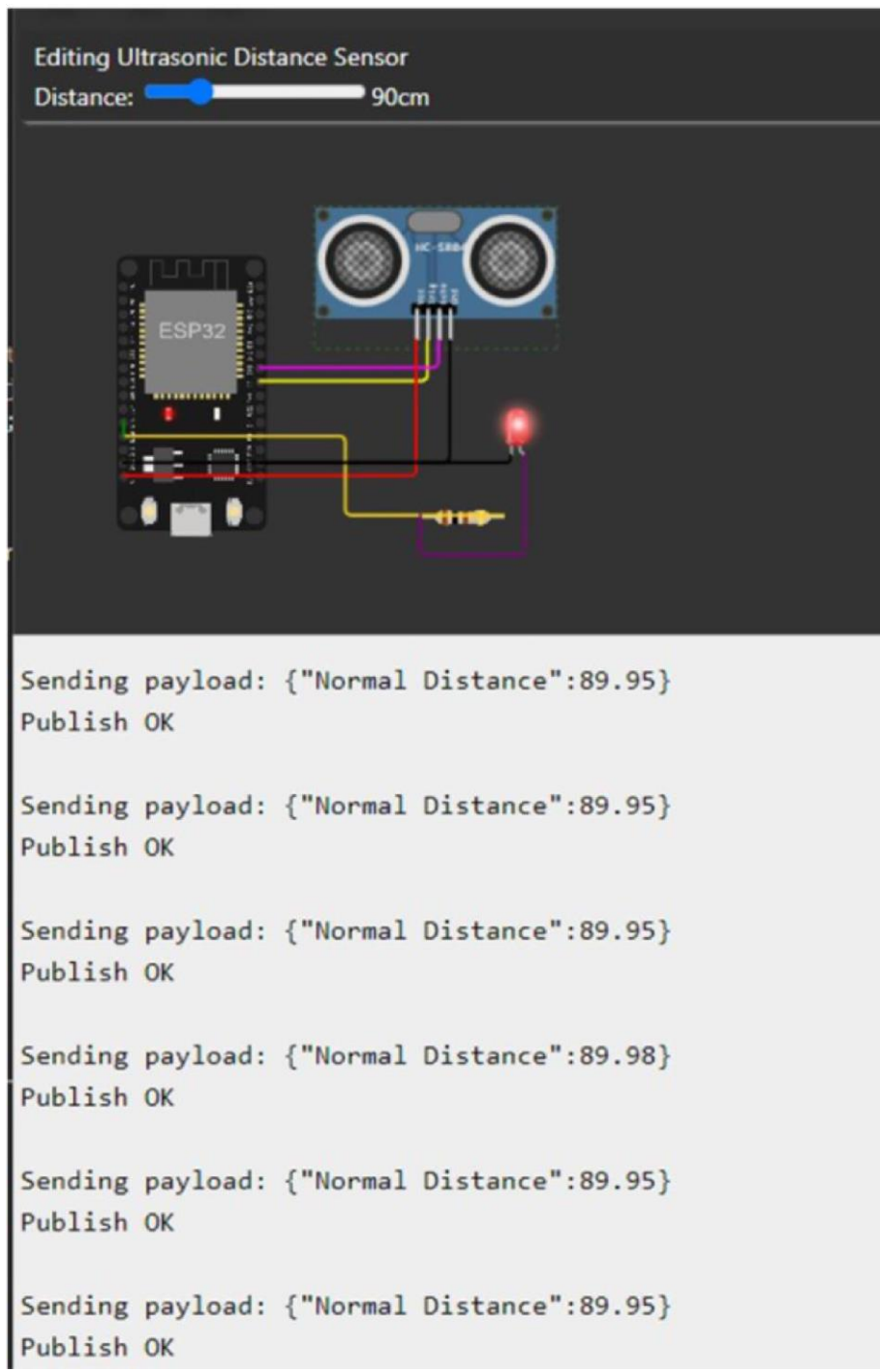
```
   }
   if(dist>101 && dist<111){
   String payload = "{\"Alert distance\":";
payload += dist;    payload += "}";
   Serial.print("\n");
   Serial.print("Sending payload: ");
Serial.println(payload);
    if(client.publish(publishTopic, (char*) payload.c_str())) {
     Serial.println("Warning crosses 110cm -- it automaticaly of the loop");
digitalWrite(led,HIGH);
   }else {
    Serial.println("Publish FAILED");
   }
    }
 }
 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="";
}
```
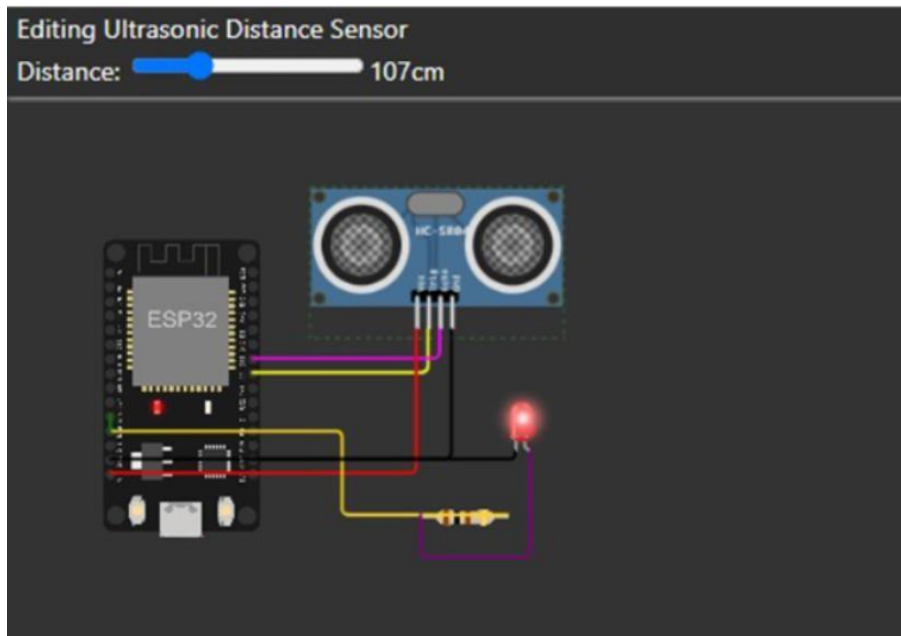
Output :

1) When Distance < 100 cm, it will show normal distance.

Editing Ultrasonic Distance Sensor
Distance: ▬▬▬●▬▬▬▬▬ 90cm

Sending payload: {"Normal Distance":89.95}
Publish OK

Sending payload: {"Normal Distance":89.95}
Publish OK

Sending payload: {"Normal Distance":89.95}
Publish OK

Sending payload: {"Normal Distance":89.98}
Publish OK

Sending payload: {"Normal Distance":89.95}
Publish OK

Sending payload: {"Normal Distance":89.95}
Publish OK

2)When distance > 100cm <110cm, alert with warning message occurs.

```
Editing Ultrasonic Distance Sensor
Distance: ●━━━━━━━━━  107cm
```

Sending payload: {"Alert distance":106.98}
Warning crosses 110cm -- it automaticaly of the loop

Sending payload: {"Alert distance":106.98}
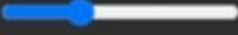Warning crosses 110cm -- it automaticaly of the loop

Sending payload: {"Alert distance":106.98}
Warning crosses 110cm -- it automaticaly of the loop

Sending payload: {"Alert distance":106.98}
Warning crosses 110cm -- it automaticaly of the loop
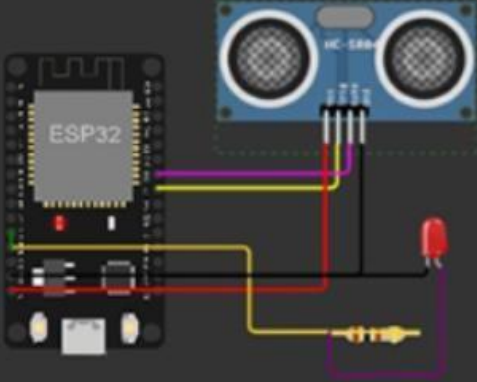
Sending payload: {"Alert distance":106.98}
Warning crosses 110cm -- it automaticaly of the loop

Sending payload: {"Alert distance":106.98}
Warning crosses 110cm -- it automaticaly of the loop

3)When distance>110cm, totally moves to iff state.

```
Editing Ultrasonic Distance Sensor
Distance: ━━━●━━━━━━ 125cm
```



```
Sending payload: {"Alert distance":106.96}
Warning crosses 110cm -- it automaticaly of the loop

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```
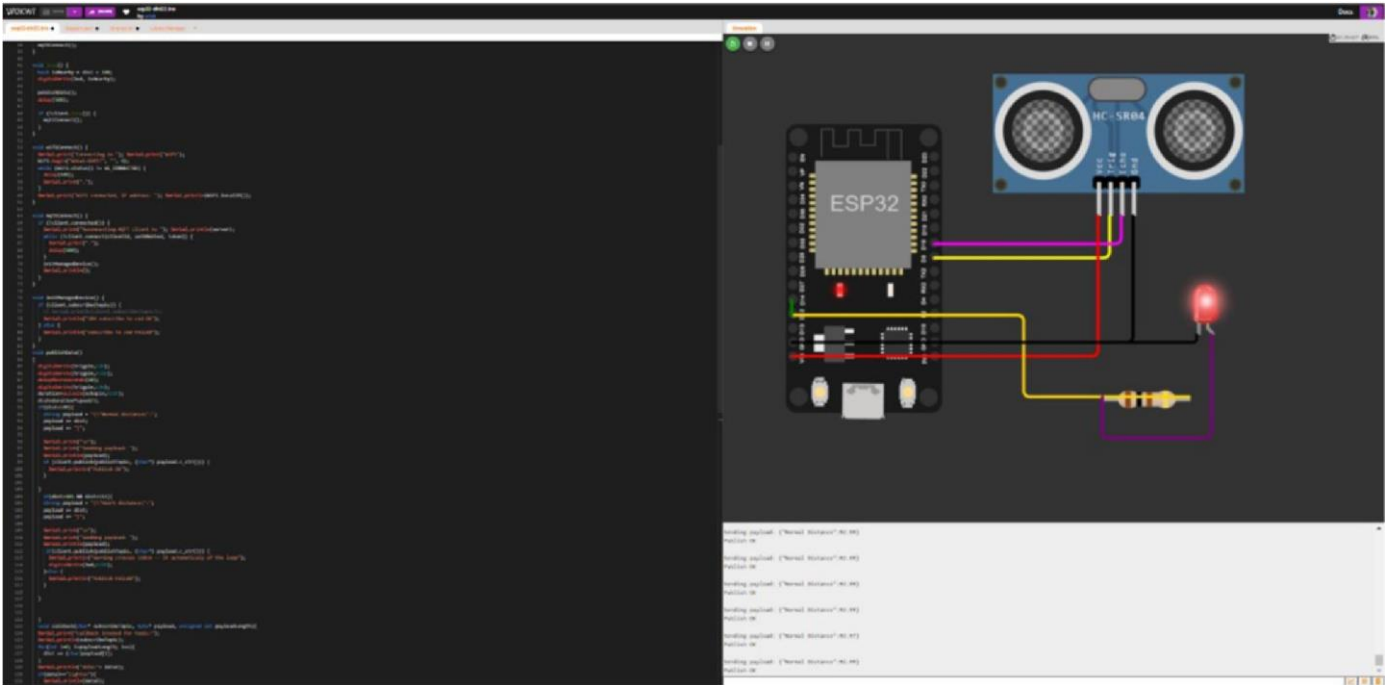
IBM Cloud Output:

Recent Events

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

Event	Value	Format	Last Received
Data	{"Normal Distance":89.95}	json	a few seconds ago
Data	{"Normal Distance":89.95}	json	a few seconds ago
Data	{"Normal Distance":89.95}	json	a few seconds ago
Data	{"Normal Distance":89.95}	json	a few seconds ago
Data	{"Normal Distance":89.95}	json	a few seconds ago

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Event	Value	Format	Last Received
Data	{"Alert distance":106.98}	json	a few seconds ago
Data	{"Alert distance":107.03}	json	a few seconds ago
Data	{"Alert distance":106.98}	json	a few seconds ago
Data	{"Alert distance":106.98}	json	a few seconds ago
Data	{"Alert distance":106.98}	json	a few seconds ago

Recent Events

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

Event	Value	Format	Last Received
Data	{"Normal Distance":92.99}	json	a few seconds ago
Data	{"Normal Distance":92.99}	json	a few seconds ago
Data	{"Normal Distance":92.99}	json	a few seconds ago
Data	{"Normal Distance":92.99}	json	a few seconds ago
Data	{"Normal Distance":92.99}	json	a few seconds ago