Assignment -4

Distance Detection Using Ultrasonic Sensor

Date	15 October 2022
Team ID	PNT2022TMID05741
Project Name	Gas Leakage Monitoring and AlertingSystem
Maximum Marks	4 Marks

CODE:

```
#include <WiFi.h>//library for wifi #include
<PubSubClient.h>//library for MQtt


void callback(char* subscribetopic, byte* payload, unsigned intpayloadLength);

//-------credentials of IBM Accounts------

#define ORG "f59trs"//IBM ORGANITION ID
#define DEVICE_TYPE "ultrasonicsensor"//Device type mentioned inibm watson IOT
Platform
#define DEVICE_ID "distancedetection"//Device ID mentioned in ibmwatson IOT
Platform
#define TOKEN "AlGMGaaF01nawa1QA3"            //Token
String data3;
float dist;


//-------- Customise the above values --------
char server[] = ORG ".messaging.internetofthings.ibmcloud.com";//Server Name
char publishTopic[] = "iot-2/evt/Data/fmt/json";// topic name andtype of event perform
and format in which data to be send
char subscribetopic[] = "iot-2/cmd/test/fmt/String";//
cmd  REPRESENT command type AND COMMAND IS TEST OF FORMAT STRING
char authMethod[] = "use-token-auth";// authentication methodchar token[] = TOKEN;
char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;//clientid


//                                                                -
WiFiClient wifiClient; // creating the instance for wificlient
```

```
PubSubClient client(server, 1883, callback ,wifiClient);
//calling the predefined client id by passing parameter like server
id,portand wificredential

int   LED   =   4;   int
trig = 5; int echo =
18; void setup()
{
Serial.begin(115200);
pinMode(trig,OUTPUT);
pinMode(echo,INPUT);
pinMode(LED, OUTPUT);
delay(10); wificonnect();
mqttconnect();
}
void loop()// Recursive Function
{

  digitalWrite(trig,LOW); digitalWrite(trig,HIGH);
    delayMicroseconds(10);
    digitalWrite(trig,LOW);
    float dur = pulseIn(echo,HIGH); float dist
    = (dur * 0.0343)/2; Serial.print
    ("Distancein cm"); Serial.println(dist);


    PublishData(dist);
    delay(1000); if
    (!client.loop()) {
    mqttconnect();
    }
}



/*.....retrieving to
Cloud. ..... */

void PublishData(float dist) { mqttconnect();//function call for connecting
    to ibm
    /* creating the String in in form JSon to update the data to ibm cloud
    */
    String object;
```

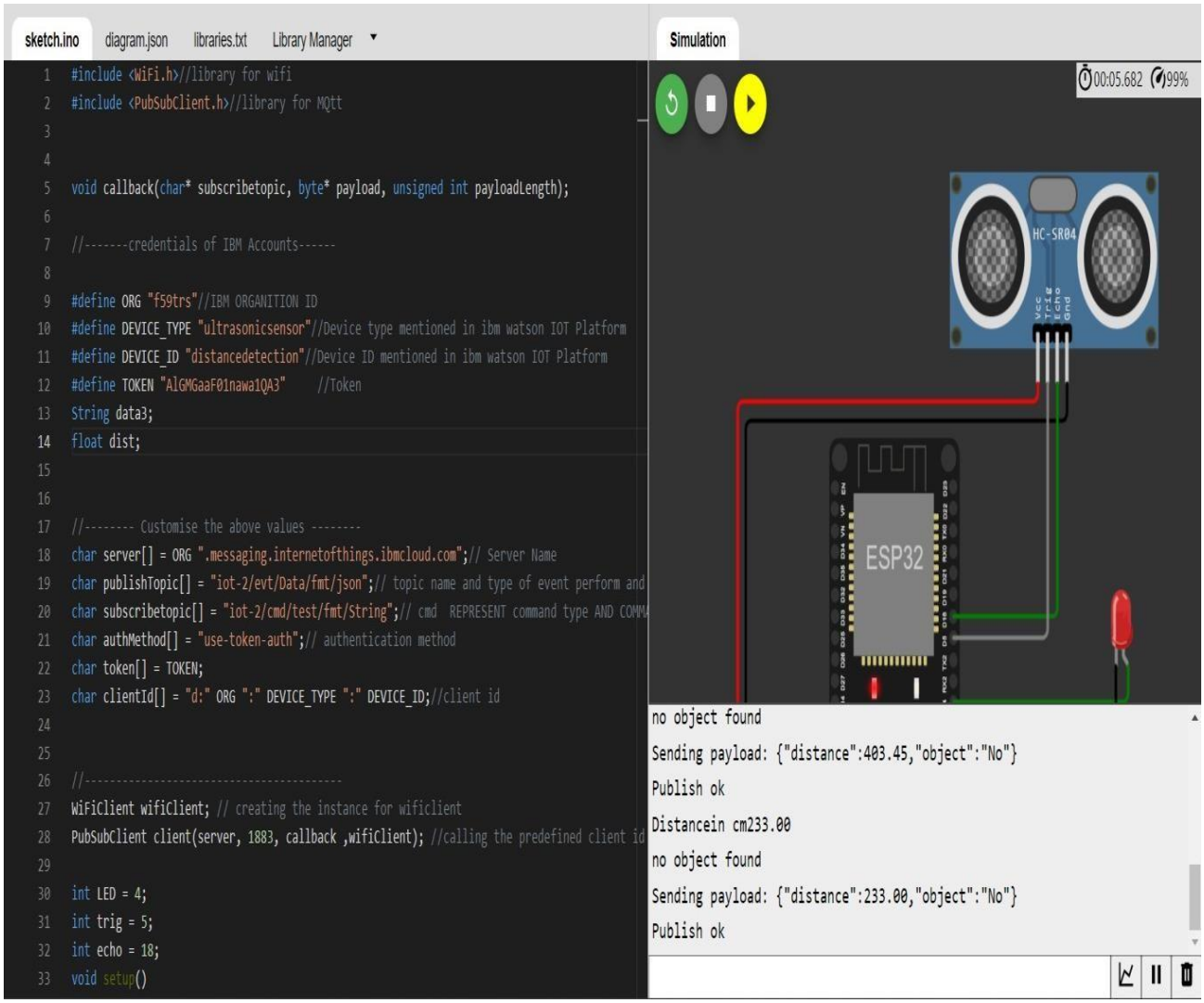
```
    if (dist <100)
    { digitalWrite(LED,HIGH);
        Serial.println("object is near"); object =
        "Near";
    }
    else
    { digitalWrite(LED,LOW); Serial.println("no
        object found"); object = "No";
    }

    String payload = "{\"distance\":"; payload +=
    dist;
    payload  +=  ","  "\"object\":\"";  payload
    += object; payload += "\"}";


    Serial.print("Sending payload: ");
    Serial.println(payload);




    if (client.publish(publishTopic, (char*) payload.c_str())) {
        Serial.println("Publish ok");// if it sucessfully upload data on the cloud then it
will print publish ok in Serial monitor or else it will print publish failed
    } else {
        Serial.println("Publish failed");
    }

}
void mqttconnect() { if (!client.connected()) {
    Serial.print("Reconnecting client to ");
    Serial.println(server);
        while (!!!client.connect(clientId, authMethod, token)) {
            Serial.print("."); delay(500);
        }

          initManagedDevice();
          Serial.println();
    }
}
```

```
void wificonnect() //function defination for wificonnect
{
  Serial.println();    Serial.print("Connecting
  to ");

  WiFi.begin("Wokwi-GUEST", "", 6);//passing the wifi credentials to establish
the connection while (WiFi.status() != WL_CONNECTED) { delay(500);
    Serial.print(".");
  }
  Serial.println(""); Serial.println("WiFi
  connected"); Serial.println("IP address: ");
  Serial.println(WiFi.localIP());
}

void initManagedDevice() { if (client.subscribe(subscribetopic)) {
  Serial.println((subscribetopic)); Serial.println("subscribe to cmd
  OK");
  } else {
    Serial.println("subscribe to cmd 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++) {
    //Serial.print((char)payload[i]); data3 +=
    (char)payload[i];
  }

//      Serial.println("data: "+ data3);
//      if(data3=="Near")
//      {
// Serial.println(data3);
// digitalWrite(LED,HIGH);

//      }

//      else
//      {
// Serial.println(data3);
```

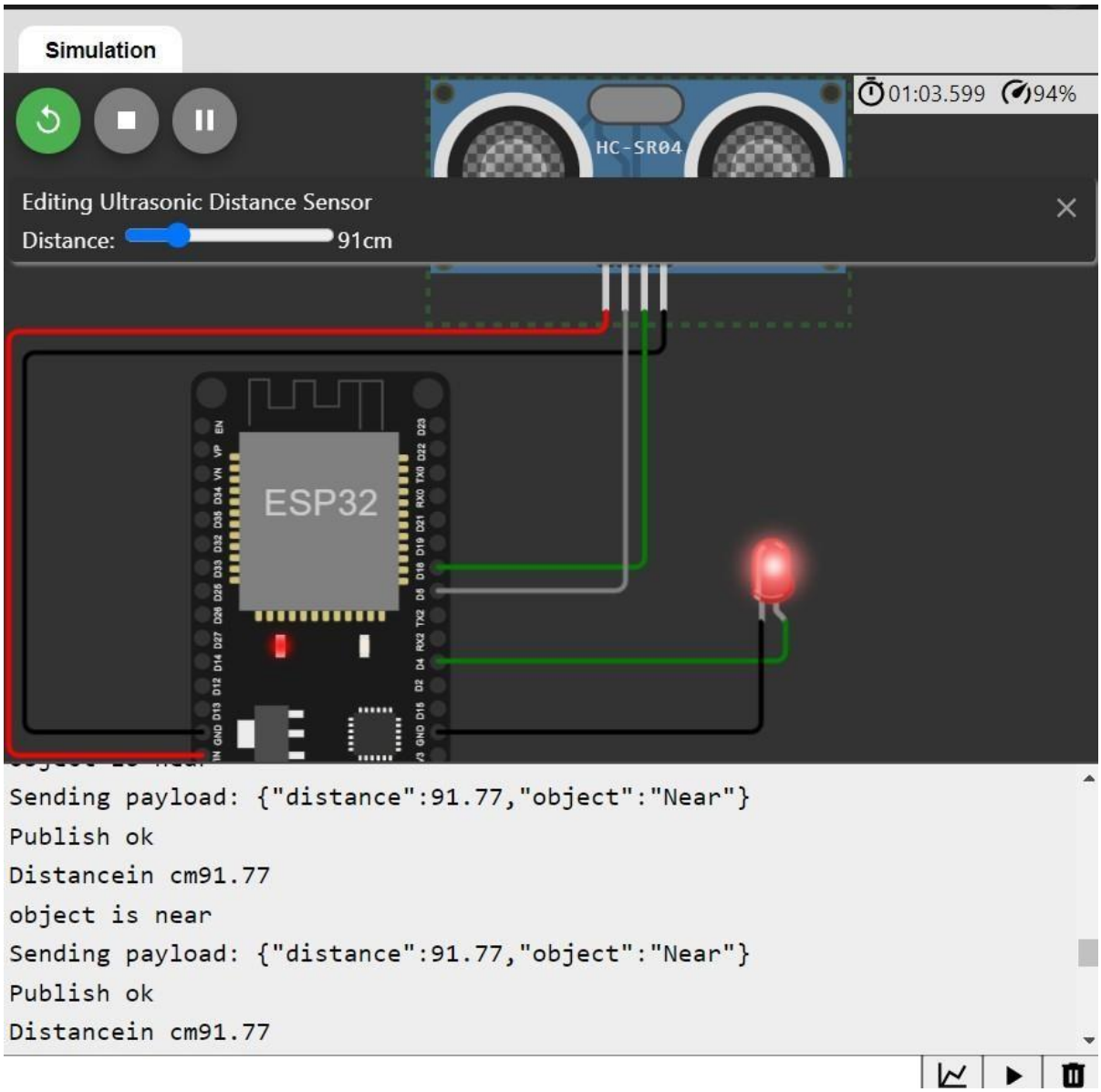
```
// digitalWrite(LED,LOW);

// }
data3="";


}
```

OUTPUT:

When object is not near to the ultrasonic sensor



Data sent to the IBM cloud device when the object is far when object is nearer to the ultrasonic sensor



Data sent to the IBM cloud device when the object is near