Assignment -4

Distance Detection Using Ultrasonic Sensor

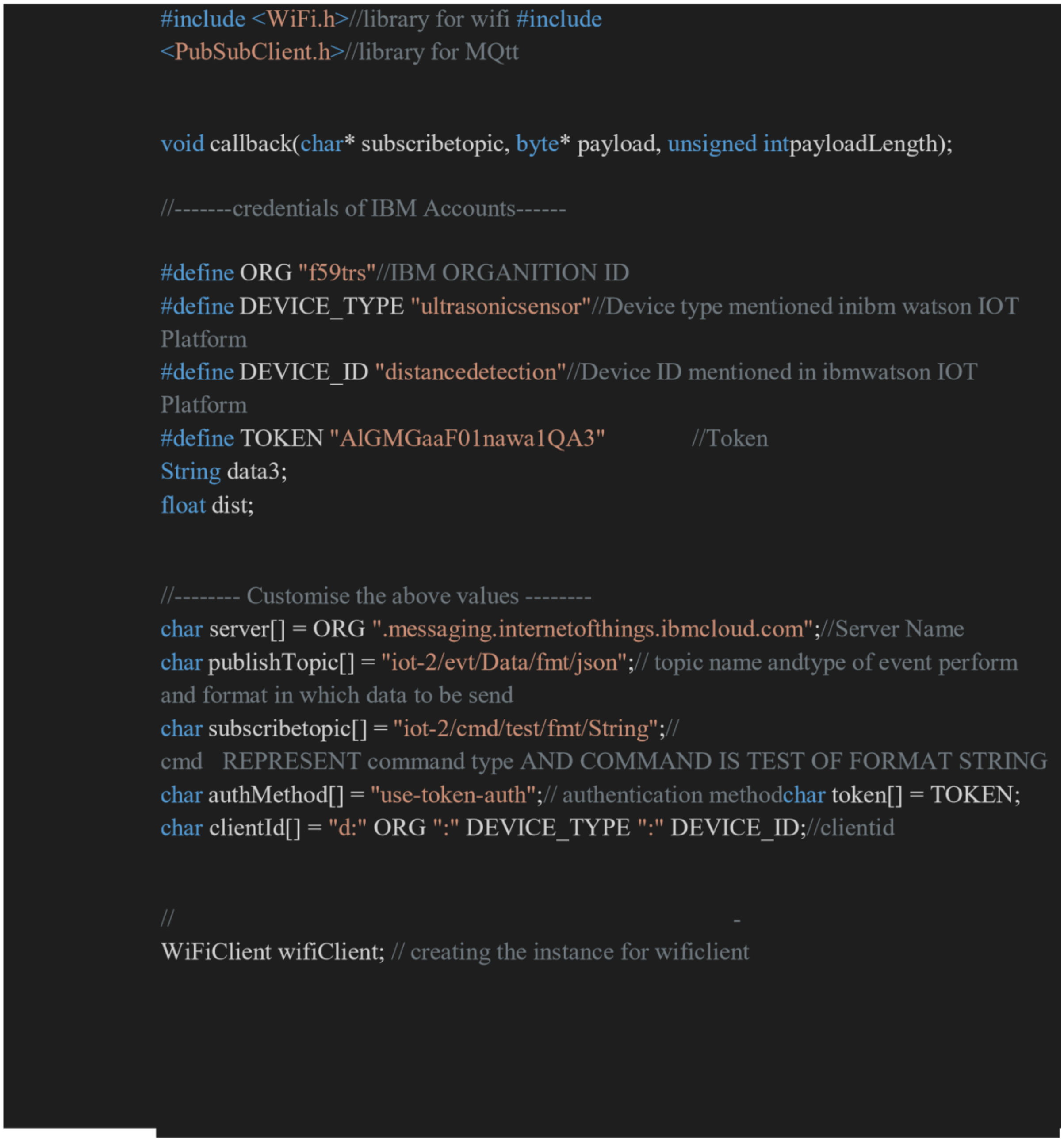
Assignment Date	25 October 2022
Student Name	V RANJANI
Student Roll Number	622119105085
Maximum Marks	2 Marks

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.

WOKWI LINK: https://wokwi.com/projects/346502216516895315

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
```

```
   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();
   }
}

   String object;
```

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

// }
data3="";



}
```

```
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)
{

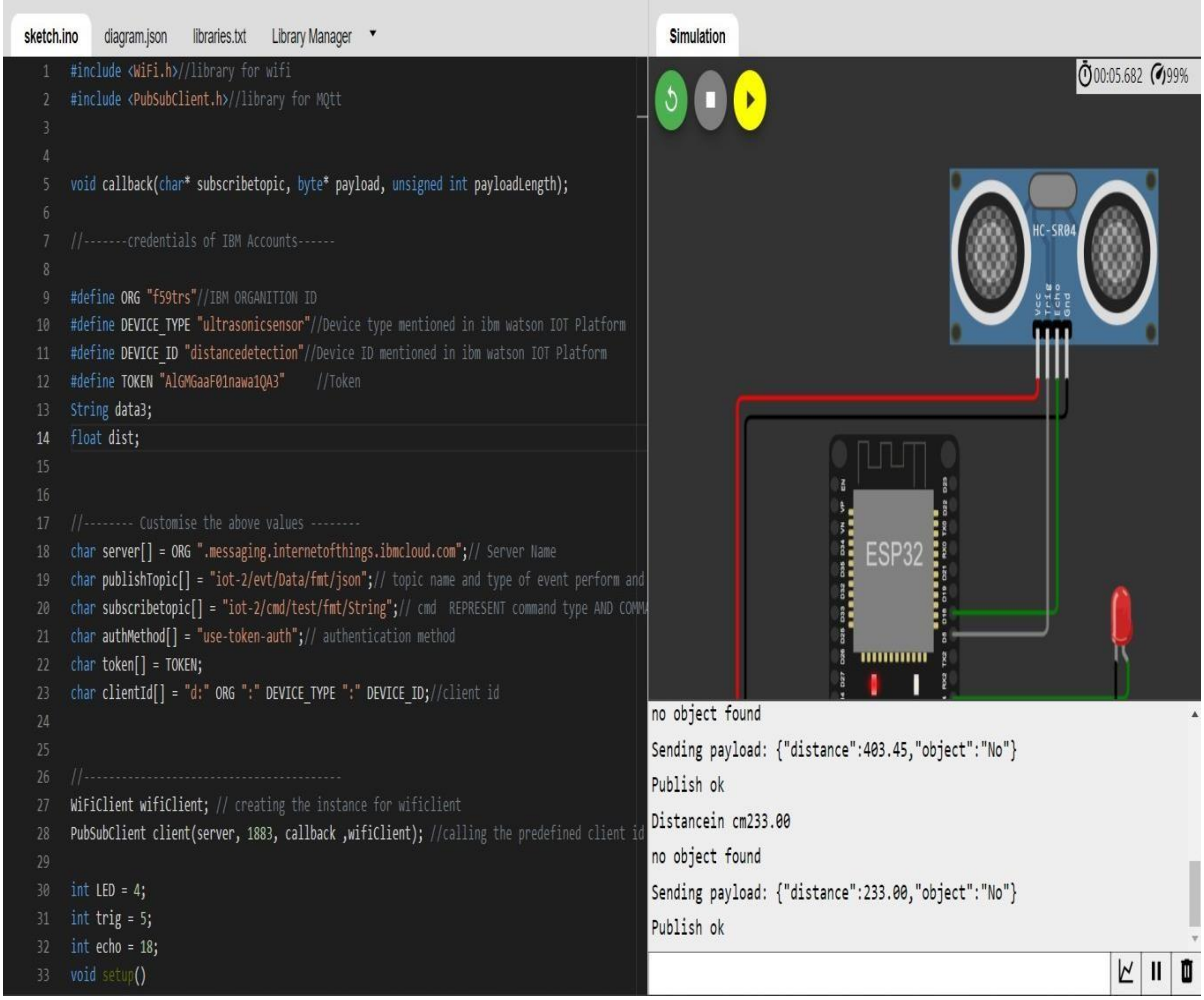
   Serial.print("callback invoked for topic: ");
   Serial.println(subscribetopic);
   for (int i = 0; i < payloadLength; i++) {
      //Serial.print((char)payload[i]); data3 +=
      (char)payload[i];
   }

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

//          }

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

OUTPUT: When object is not near to the ultrasonic sensor



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char subscribetopic[] = "iot-2/cmd/test/fmt/String";// cmd  REPRESENT command type AND COMM
char authMethod[] = "use-token-auth";// authentication method
char token[] = TOKEN;
char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;//client id

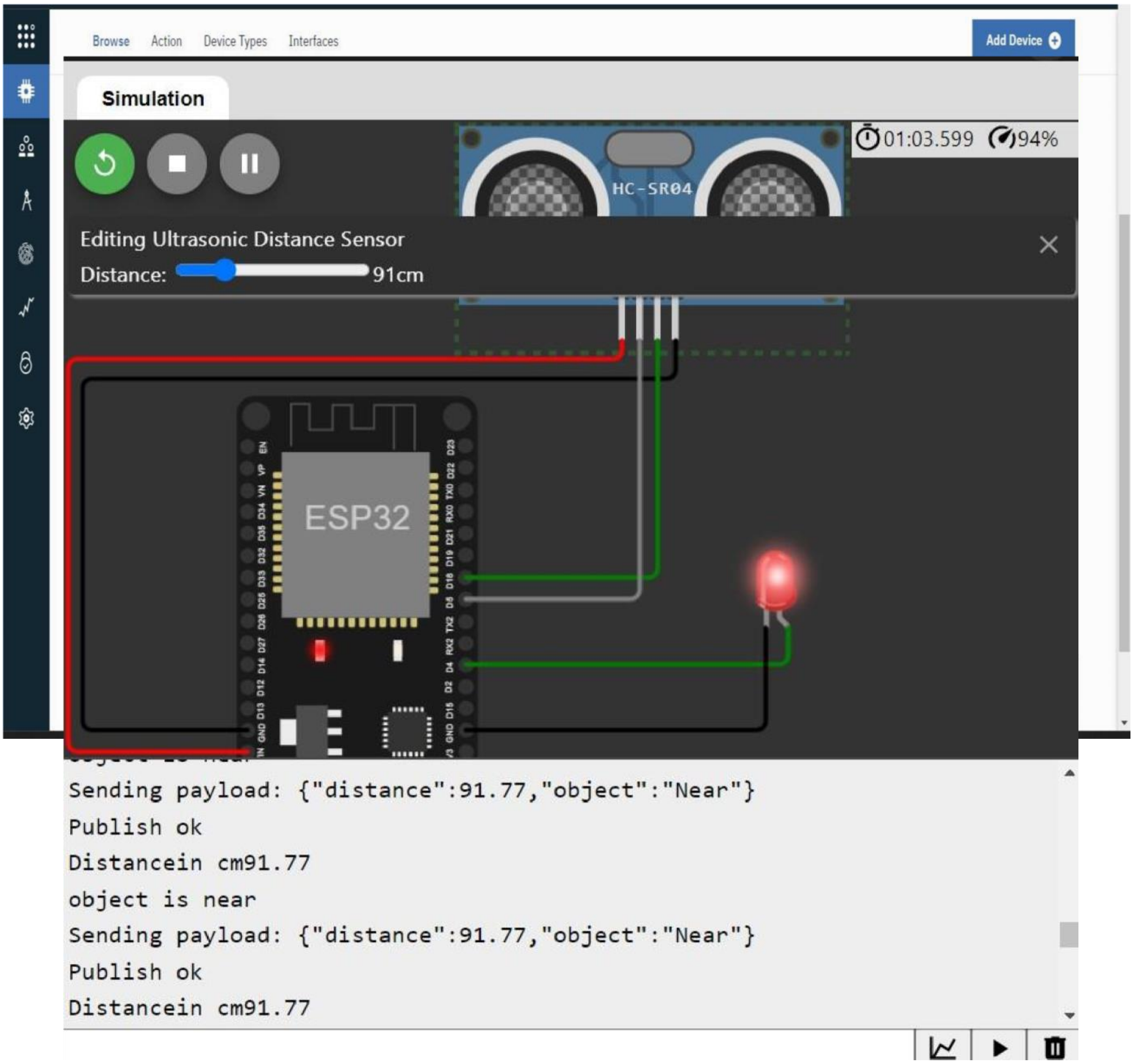

//-----------------------------------------
WiFiClient wifiClient; // creating the instance for wificlient
PubSubClient client(server, 1883, callback ,wifiClient); //calling the predefined client id

int LED = 4;
int trig = 5;
int echo = 18;
void setup()
```

```
no object found
Sending payload: {"distance":403.45,"object":"No"}
Publish ok
Distancein cm233.00
no object found
Sending payload: {"distance":233.00,"object":"No"}
Publish ok
```

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

When object is nearer to the ultrasonic sensor Data sent

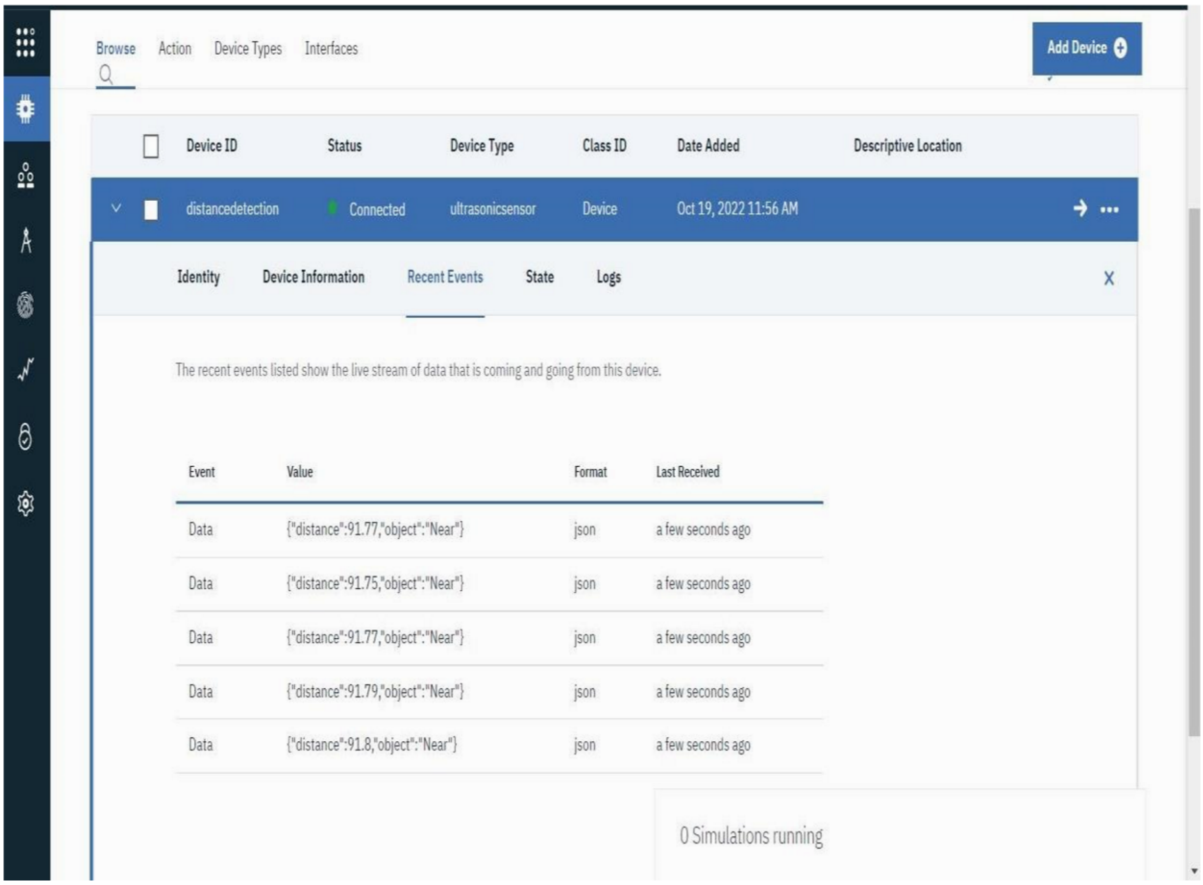


Editing Ultrasonic Distance Sensor

Distance: 91cm

```
Sending payload: {"distance":91.77,"object":"Near"}
Publish ok
Distancein cm91.77
object is near
Sending payload: {"distance":91.77,"object":"Near"}
Publish ok
Distancein cm91.77
```

to the IBM cloud device when the object is near



□	Device ID	Status	Device Type	Class ID	Date Added	Descriptive Location
□	distancedetection	● Connected	ultrasonicsensor	Device	Oct 19, 2022 11:56 AM	

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":91.77,"object":"Near"}	json	a few seconds ago
Data	{"distance":91.75,"object":"Near"}	json	a few seconds ago
Data	{"distance":91.77,"object":"Near"}	json	a few seconds ago
Data	{"distance":91.79,"object":"Near"}	json	a few seconds ago
Data	{"distance":91.8,"object":"Near"}	json	a few seconds ago

0 Simulations running