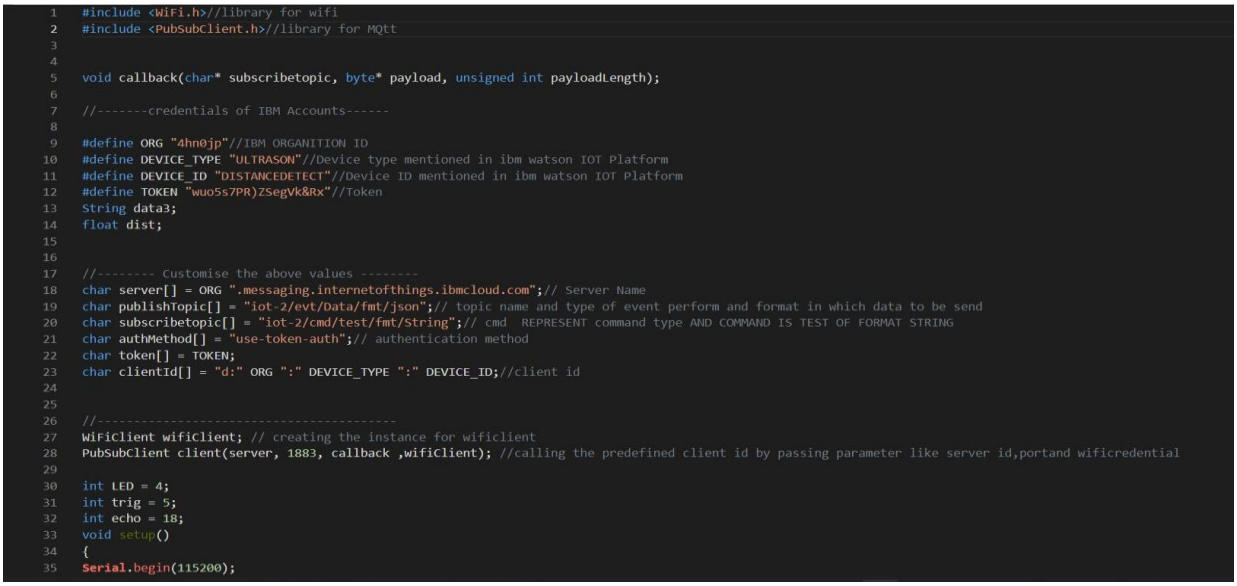
ASSIGNMENT - 4

DISTANCE DETECTION USING ULTRASONIC SENSOR

Date	10 NOVEMBER 2022
Team ID	**PNT2022TMID47589**
Name	N.Swetha
Register Number	911019104028
Maximum Marks	2 Marks

CODE:



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


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

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

#define ORG "4hn0jp"//IBM ORGANITION ID
#define DEVICE_TYPE "ULTRASON"//Device type mentioned in ibm watson IOT Platform
#define DEVICE_ID "DISTANCEDETECT"//Device ID mentioned in ibm watson IOT Platform
#define TOKEN "wuo5s7PR)ZSegVk&Rx"//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 and type 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 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 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
```

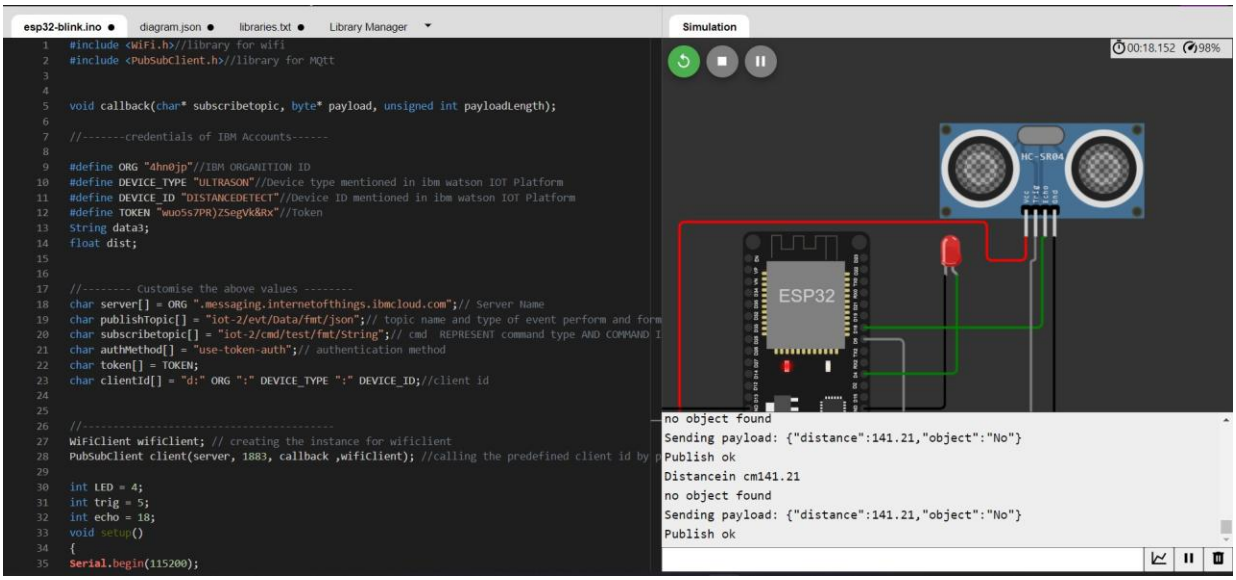
```
    creating the String in in form JSon to update the data to ibm cloud
  */
  String object;
  if (dist <100)
  {
    digitalWrite(LED,HIGH);
    Serial.println("object is near");
    object = "Near";
  }
  else
  {
    digitalWrite(LED,LOW);
    Serial.println("no object found");
    object = "No";
  }

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


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

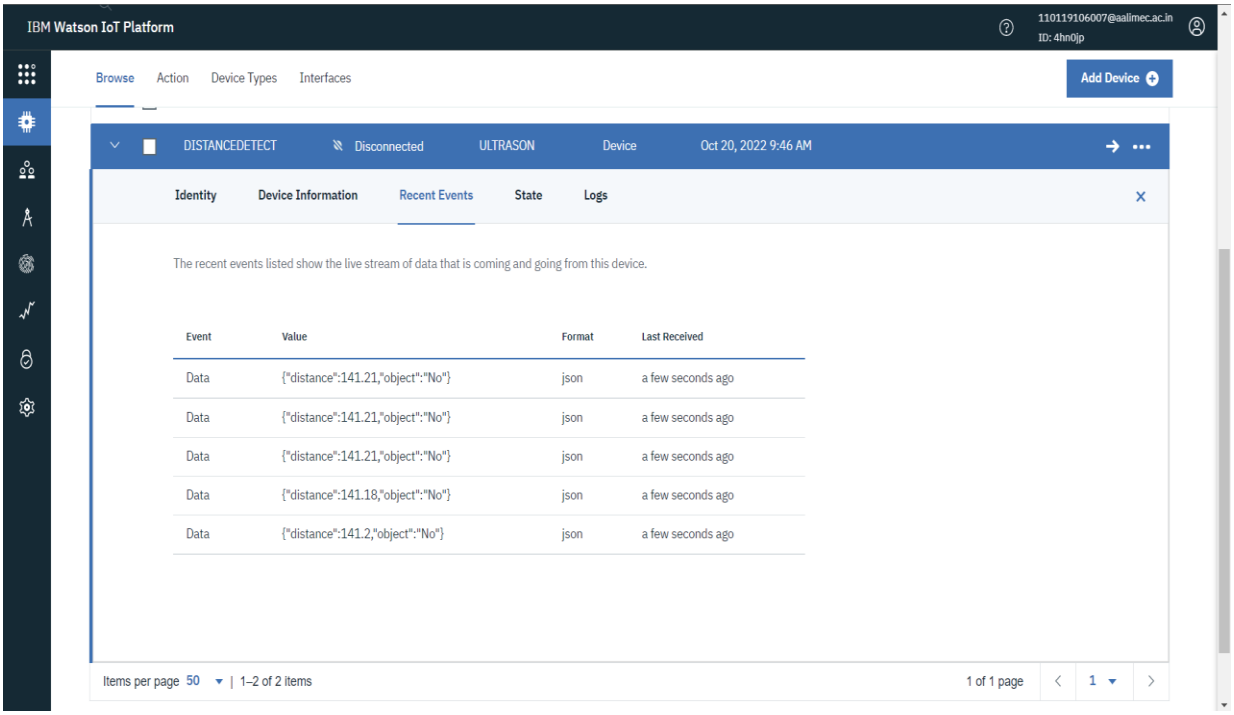
```
  if (client.publish(publishTopic, (char*) payload.c_str())) {
    Serial.println("Publish ok");// if it sucessfully upload data on the cloud then it will print publish ok in Serial monitor or else it will print publish failed
  } else {
    Serial.println("Publish failed");
  }

}
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());
```

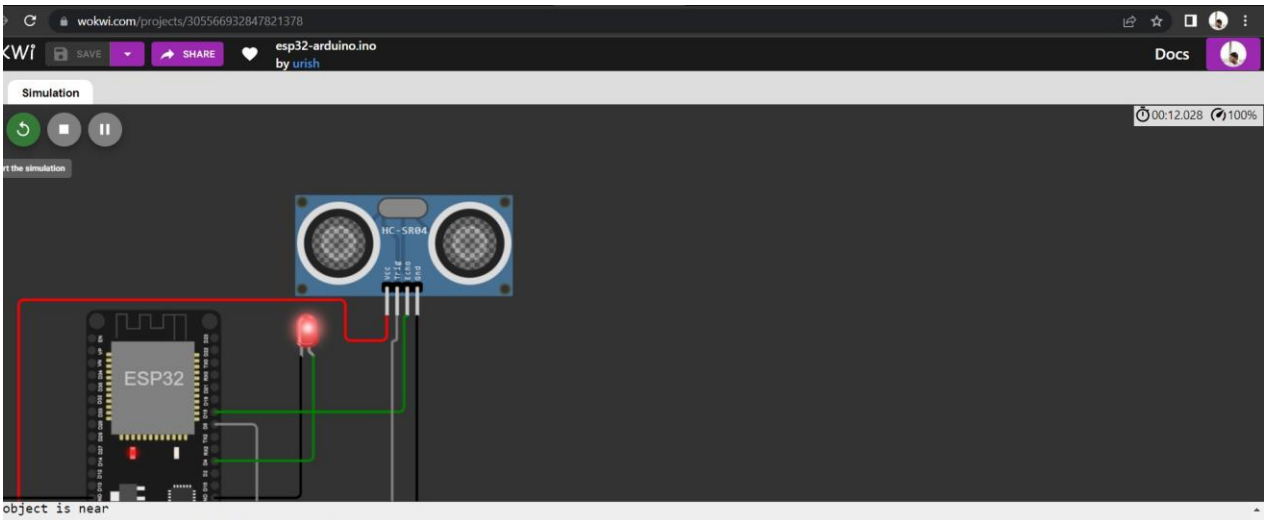
```
132     Serial.println(WiFi.localIP());
133   }
134
135   void initManagedDevice() {
136     if (client.subscribe(subscribetopic)) {
137       Serial.println((subscribetopic));
138       Serial.println("subscribe to cmd OK");
139     } else {
140       Serial.println("subscribe to cmd FAILED");
141     }
142   }
143
144   void callback(char* subscribetopic, byte* payload, unsigned int payloadLength)
145   {
146
147     Serial.print("callback invoked for topic: ");
148     Serial.println(subscribetopic);
149     for (int i = 0; i < payloadLength; i++) {
150       //Serial.print((char)payload[i]);
151       data3 += (char)payload[i];
152     }
153
154   //   Serial.println("data: "+ data3);
155   //   if(data3=="Near")
156   //   {
157   // Serial.println(data3);
```

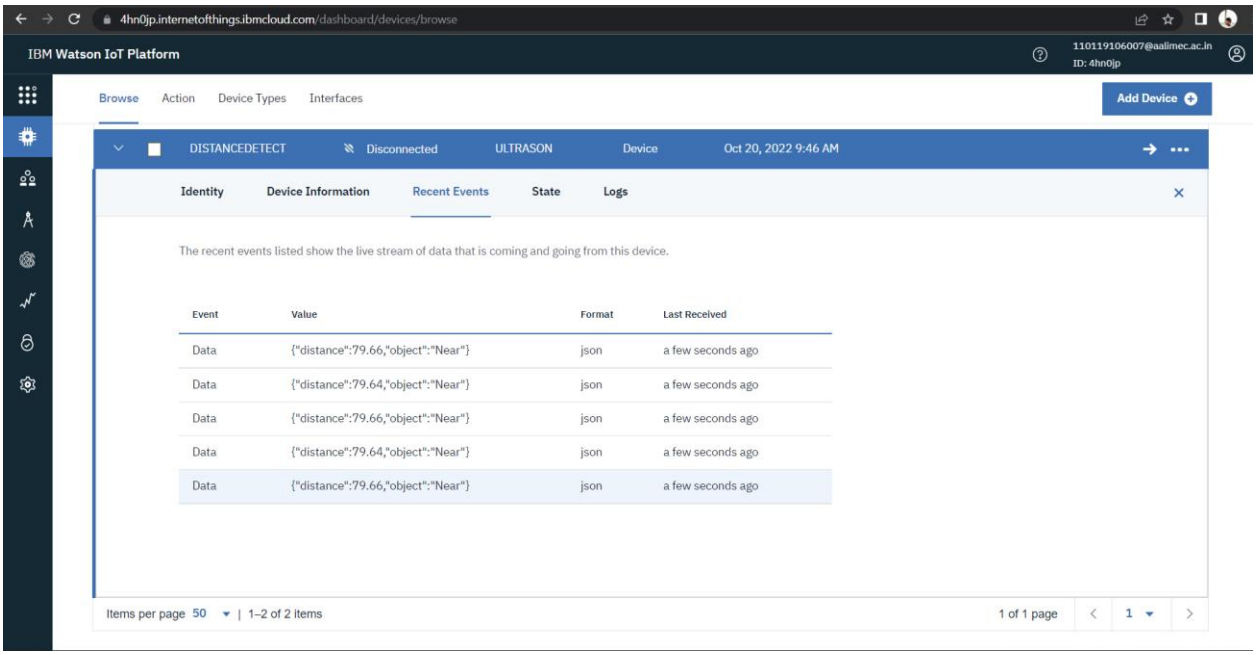
```
157   // Serial.println(data3);
158   // digitalWrite(LED,HIGH);
159
160   //   }
161
162   //   else
163   //   {
164   // Serial.println(data3);
165   // digitalWrite(LED,LOW);
166
167   //   }
168   data3="";
169
170
171   }
```

OUTPUT:


esp32-blink.ino
diagram.json
libraries.txt
Library Manager
Simulation
00:18.152
98%
HC-SR04
ESP32
no object found
Sending payload: {"distance":141.21,"object":"No"}
Publish ok
Distancein cm141.21
no object found
Sending payload: {"distance":141.21,"object":"No"}
Publish ok


IBM Watson IoT Platform
110119106007@aalimec.ac.in
ID: 4hn0jp
Browse
Action
Device Types
Interfaces
Add Device
DISTANCEDETECT
Disconnected
ULTRASON
Device
Oct 20, 2022 9:46 AM
Identity
Device Information
Recent Events
State
Logs
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":141.21,"object":"No"}
json
a few seconds ago
Data
{"distance":141.21,"object":"No"}
json
a few seconds ago
Data
{"distance":141.21,"object":"No"}
json
a few seconds ago
Data
{"distance":141.18,"object":"No"}
json
a few seconds ago
Data
{"distance":141.2,"object":"No"}
json
a few seconds ago
Items per page 50
1–2 of 2 items
1 of 1 page
1


wokwi.com/projects/305566932847821378
SAVE
SHARE
esp32-arduino.ino
by urish
Docs
Simulation
00:12.028
100%
HC-SR04
ESP32
object is near
Sending payload: {"distance":97.82,"object":"Near"}
Publish ok
Distancein cm97.82
object is near
Sending payload: {"distance":97.82,"object":"Near"}
Publish ok


4hn0jp.internetofthings.ibmcloud.com/dashboard/devices/browse
IBM Watson IoT Platform
110119106007@aalimec.ac.in
ID: 4hn0jp
Browse
Action
Device Types
Interfaces
Add Device
DISTANCEDETECT
Disconnected
ULTRASON
Device
Oct 20, 2022 9:46 AM
Identity
Device Information
Recent Events
State
Logs
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":79.66,"object":"Near"}
json
a few seconds ago
Data
{"distance":79.64,"object":"Near"}
json
a few seconds ago
Data
{"distance":79.66,"object":"Near"}
json
a few seconds ago
Data
{"distance":79.64,"object":"Near"}
json
a few seconds ago
Data
{"distance":79.66,"object":"Near"}
json
a few seconds ago
Items per page 50
1–2 of 2 items
1 of 1 page
1