ASSIGNMENT-4
DISTANCE DETECTION USING ULTRASONIC SENSOR

Date	20 October 2022
Team ID	PNT2022TMID10955
Name	AHAMED J
Student Roll Number	811519106005
Maximum Marks	2 Marks

Question1 :

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.

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 wificredentia

int LED = 4;
int trig = 5;
int echo = 18;
void setup()
{
Serial.begin(115200);
```

esp32-blink.ino ● diagram.json ● libraries.txt ● Library Manager

```
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);
```

esp32-blink.ino ● diagram.json ● libraries.txt ● Library Manager

```
98
99    if (client.publish(publishTopic, (char*) payload.c_str())) {
100     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 fail
101   } else {
102     Serial.println("Publish failed");
103   }
104
105 }
106 void mqttconnect() {
107   if (!client.connected()) {
108     Serial.print("Reconnecting client to ");
109     Serial.println(server);
110     while (!!!client.connect(clientId, authMethod, token)) {
111       Serial.print(".");
112       delay(500);
113     }
114
115     initManagedDevice();
116     Serial.println();
117   }
118 }
119 void wificonnect() //function defination for wificonnect
120 {
121   Serial.println();
122   Serial.print("Connecting to ");
123
124   WiFi.begin("Wokwi-GUEST", "", 6);//passing the wifi credentials to establish the connection
125   while (WiFi.status() != WL_CONNECTED) {
126     delay(500);
127     Serial.print(".");
128   }
129   Serial.println("");
130   Serial.println("WiFi connected");
131   Serial.println("IP address: ");
132   Serial.println(WiFi.localIP());
```

esp32-blink.ino ● diagram.json ● libraries.txt ● Library Manager

```
  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);
```

esp32-blink.ino ● diagram.json ● libraries.txt ● Library Manager

```
}

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);

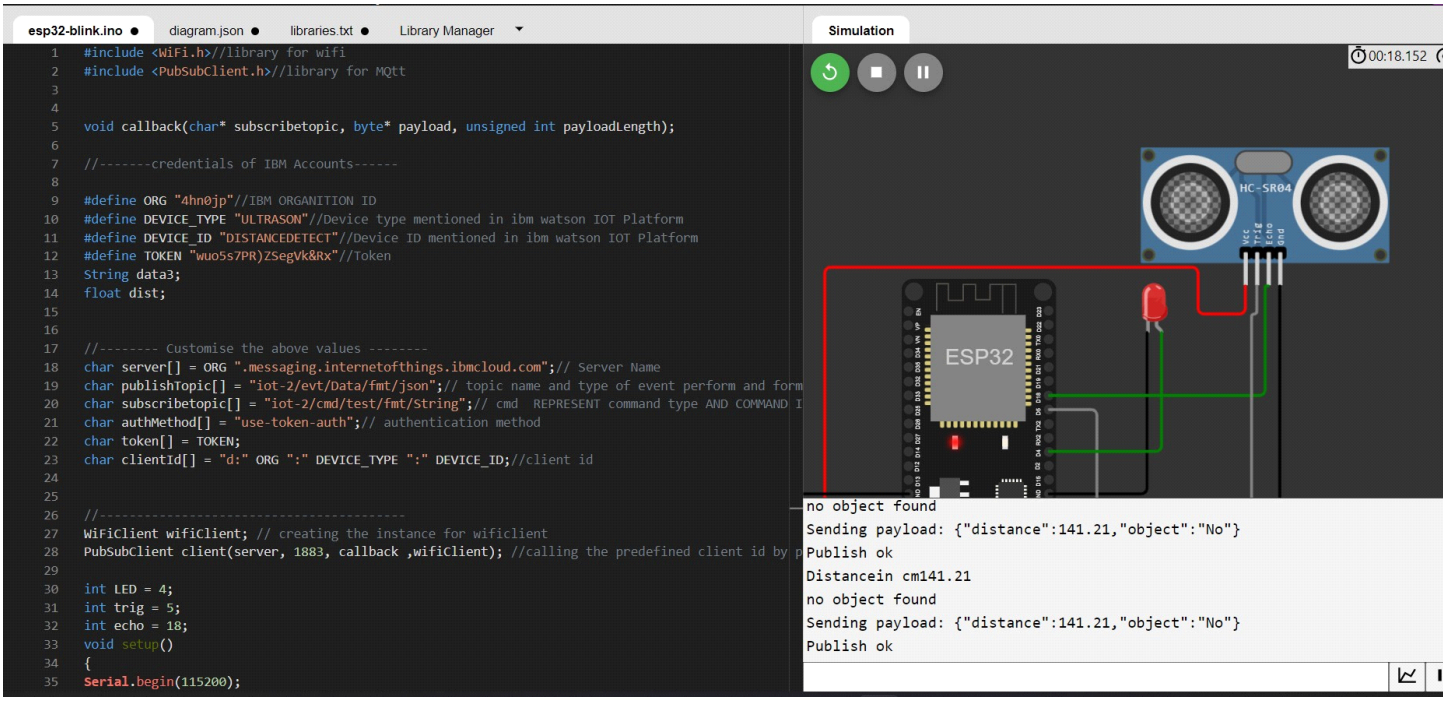
//   }

//   else
//   {
// Serial.println(data3);
// digitalWrite(LED,LOW);

//   }
data3="";


}
```

OUTPUT:

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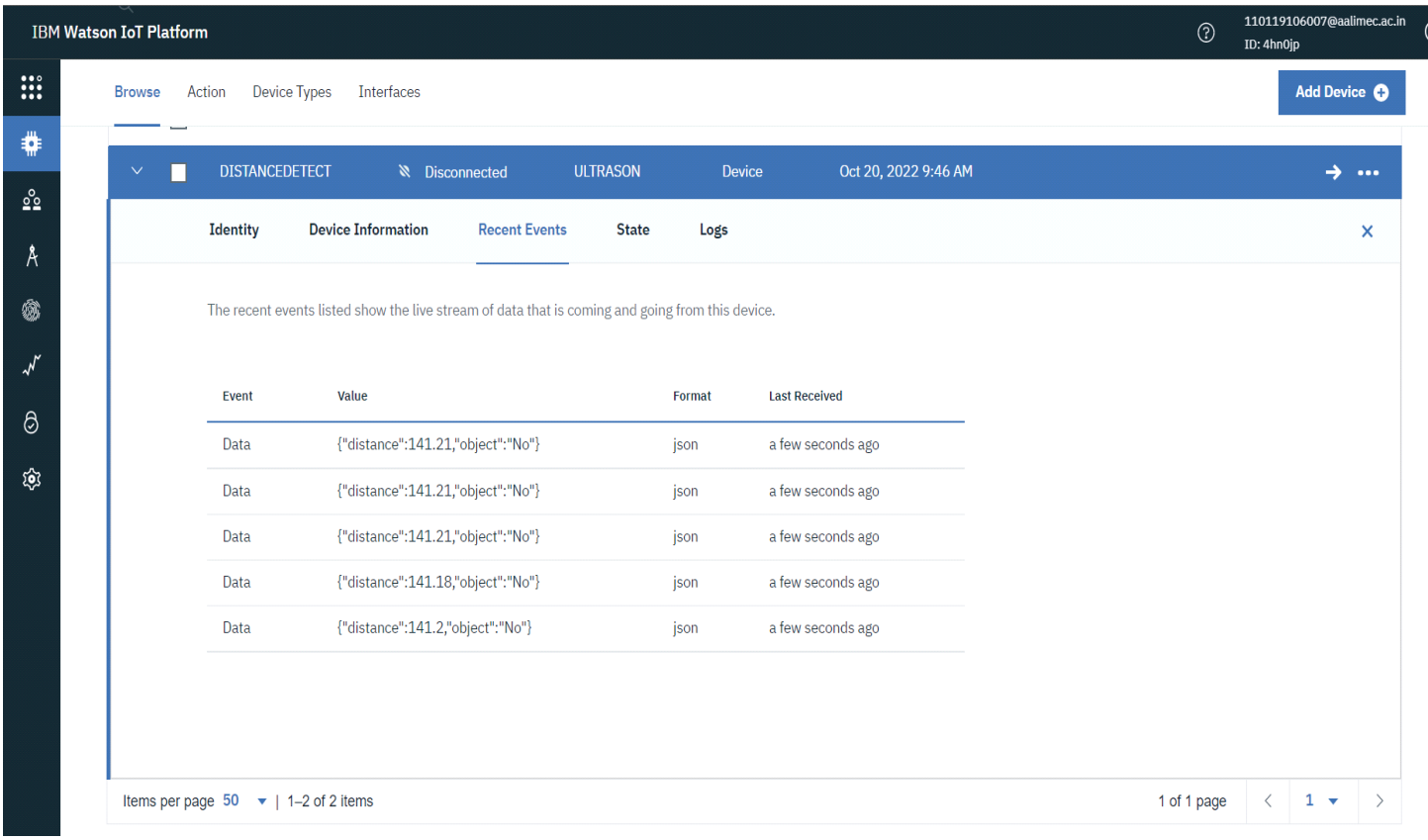
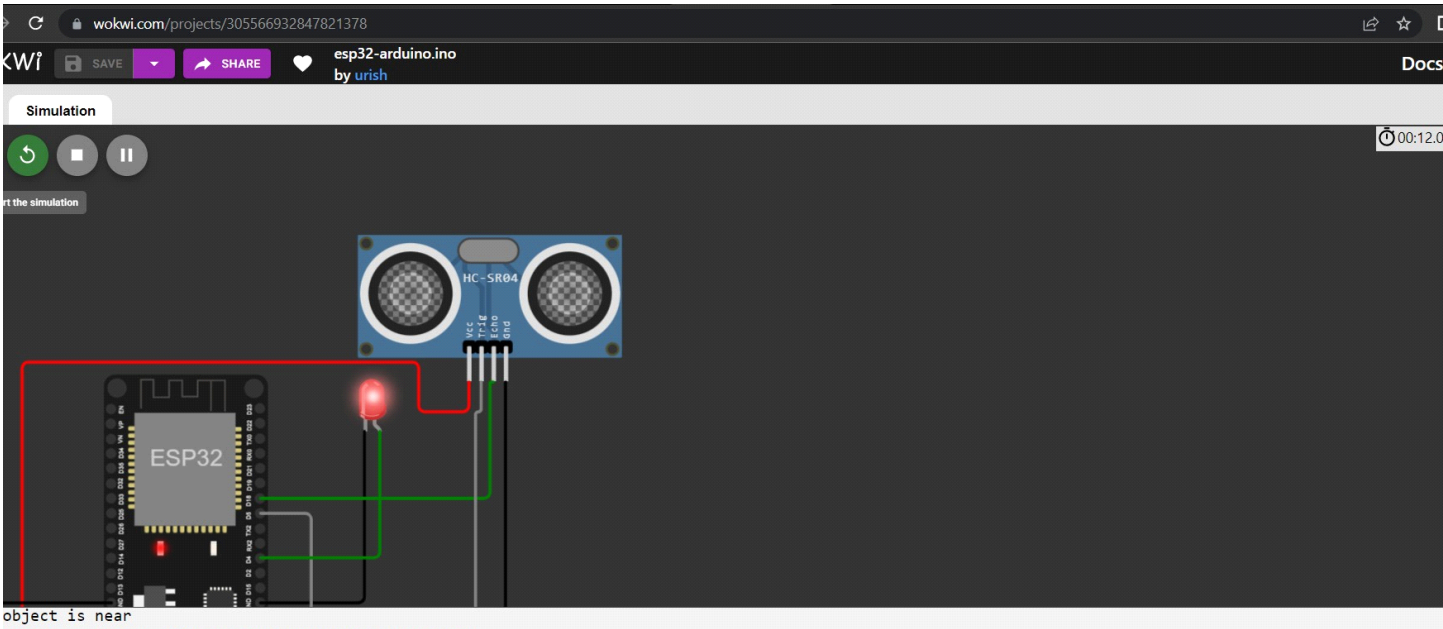
int echo = 18;
void setup()
{
Serial.begin(115200);
```

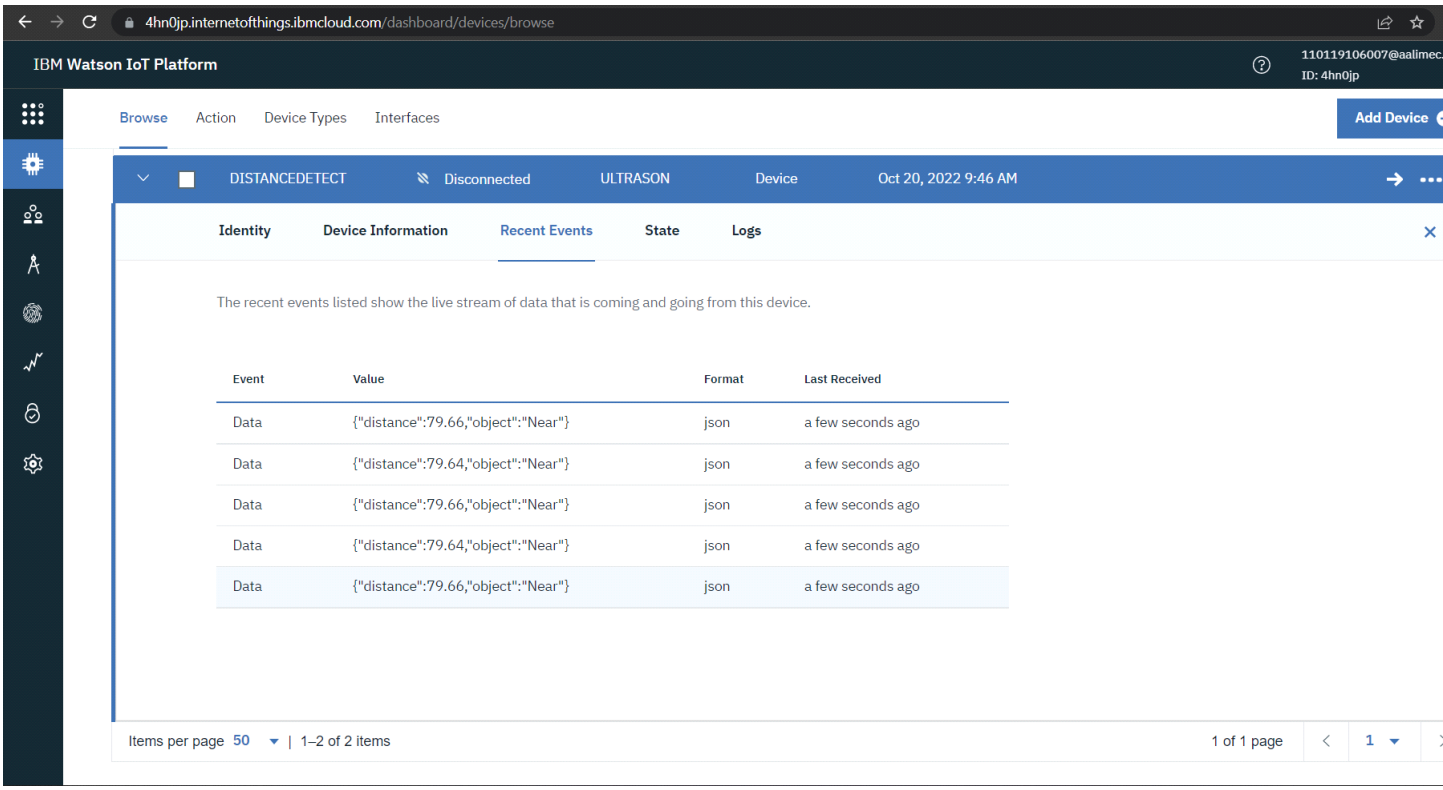
Data send to the IBM cloud device when the object is far



when object is near to the ultrasonic sensor



Data sent to the IBM Cloud Device when the object is near


4hn0jp.internetofthings.ibmcloud.com/dashboard/devices/browse
IBM Watson IoT Platform
110119106007@aalimec
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