

#### ASSIGNMENT 4

DATE	12 November 2022
TEAM ID	PNT2022TMID36762
NAME	VISHALI.R
Maximum Marks	2 Marks

#### Question 1:

Write code and connections in work for ultrasonic sensor. Whenever distance is less than 100cms send "alert" to ibm cloud and display in device recent events.

#### CODE:

```
#include <WiFi.h>
```

```
#include <PubSubClient.h>
```

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

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

```
#define ORG "9ut565"//IBM ORGANITION ID
```

```
#define DEVICE_TYPE "vishali"//Device type mentioned in ibm watson IOT Platform
```

```
#define DEVICE_ID "vishali30"//Device ID mentioned in ibm watson IOT Platform
```

```
#define TOKEN "vishali30" //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
```

```
*/ 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);
```

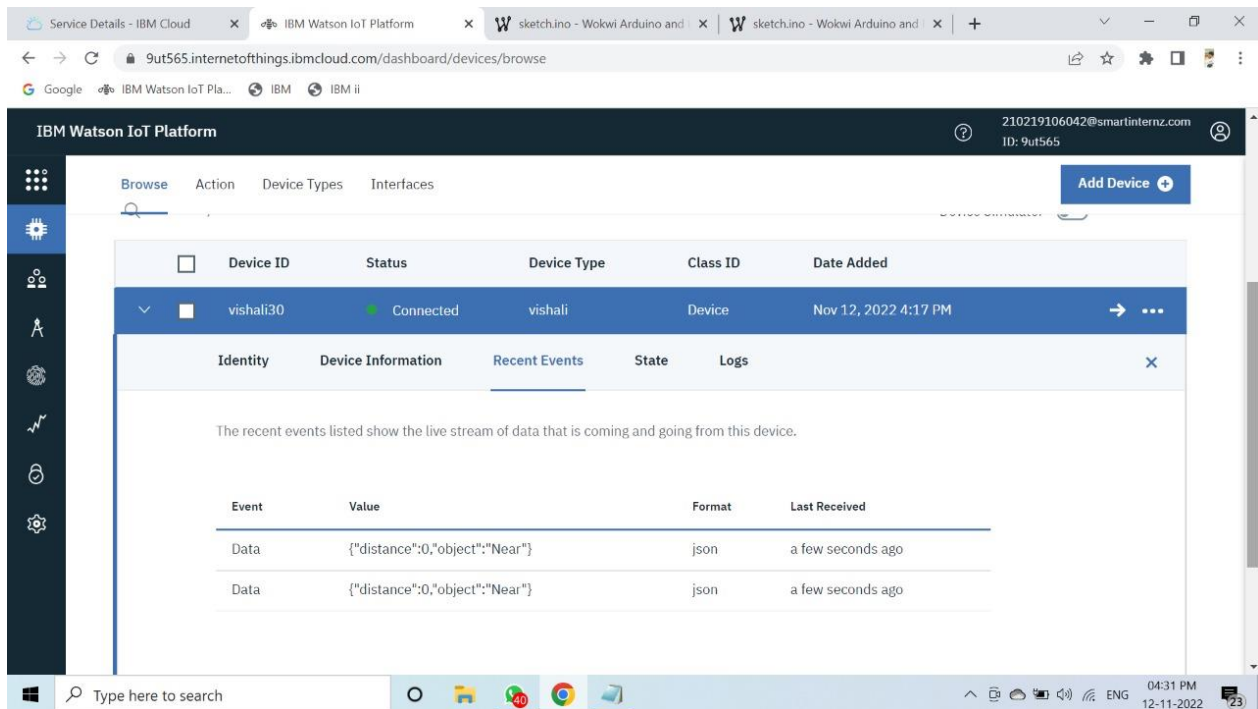
```
    // digitalWrite(LED,LOW);
```

```
    // }
```

```
    data3="";
```

```
}
```

## OUTPUT:



IBM Watson IoT Platform

210219106042@smartinternz.com  
ID: 9ut565

Browse Action Device Types Interfaces

Add Device +

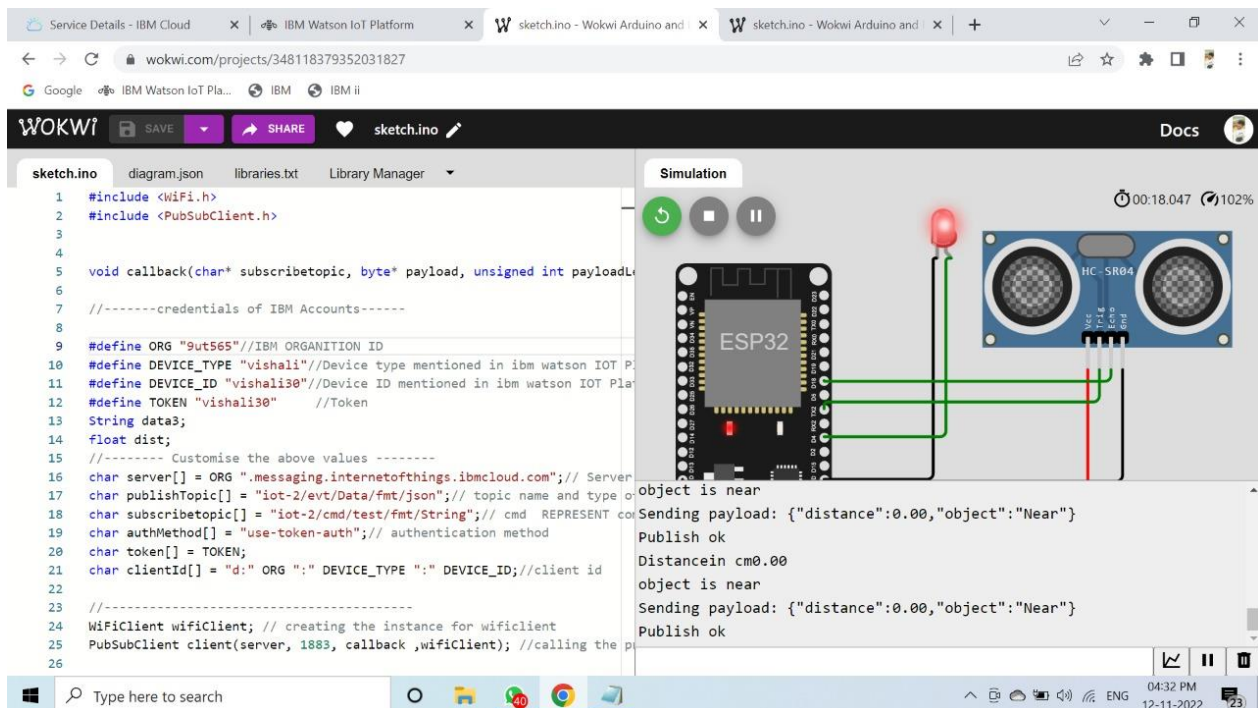
Device ID	Status	Device Type	Class ID	Date Added
vishali30	Connected	vishali	Device	Nov 12, 2022 4:17 PM

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":0,"object":"Near"}	json	a few seconds ago
Data	{"distance":0,"object":"Near"}	json	a few seconds ago

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



WOKWI

SAVE SHARE sketch.ino Docs

sketch.ino diagram.json libraries.txt Library Manager

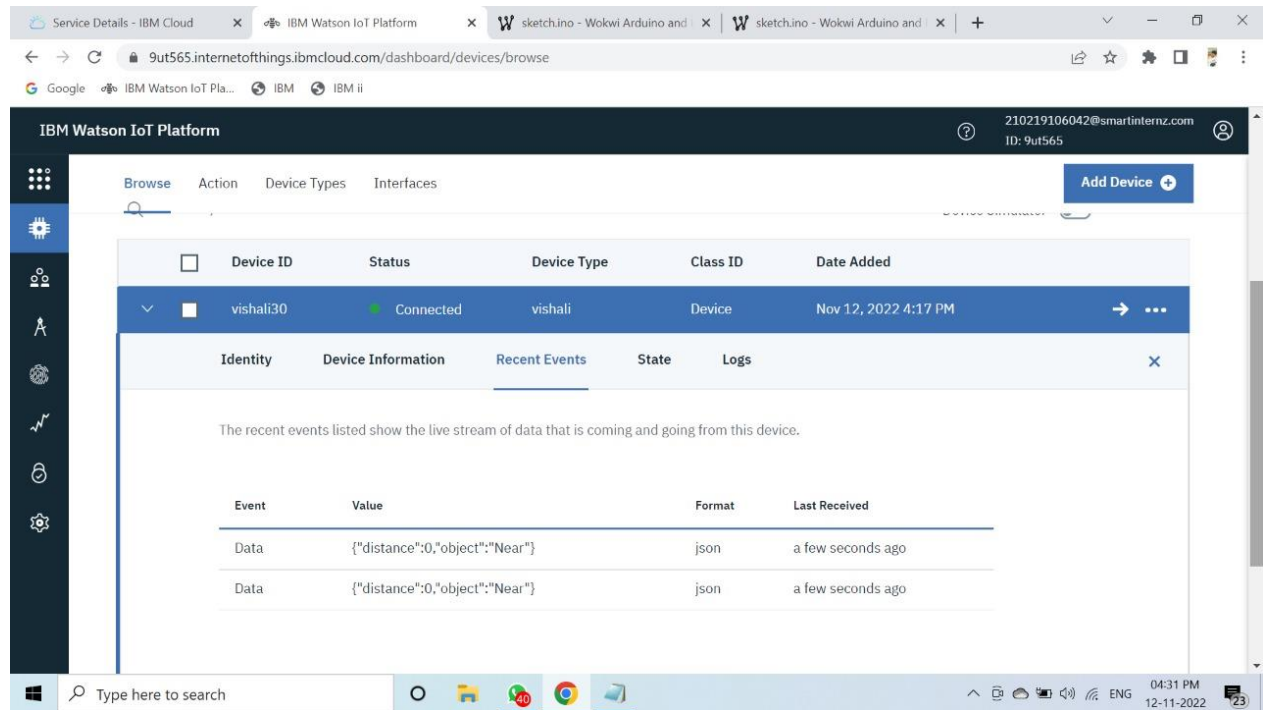
```
1 #include <WiFi.h>
2 #include <PubSubClient.h>
3
4
5 void callback(char* topic, byte* payload, unsigned int length) {
6
7 //-----credentials of IBM Accounts-----
8
9 #define ORG "9ut565"//IBM ORGANIZATION ID
10 #define DEVICE_TYPE "vishali"//Device type mentioned in ibm watson IOT Platform
11 #define DEVICE_ID "vishali30"//Device ID mentioned in ibm watson IOT Platform
12 #define TOKEN "vishali30" //Token
13 String data3;
14 float dist;
15 //----- Customise the above values -----
16 char server[] = ORG ".messaging.internetofthings.ibmcloud.com"; // Server address
17 char publishTopic[] = "iot-2/evt/Data/fmt/json"; // topic name and type of data
18 char subscribeTopic[] = "iot-2/cmd/test/fmt/String"; // cmd REPRESENT command
19 char authMethod[] = "use-token-auth"; // authentication method
20 char token[] = TOKEN;
21 char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID; //client id
22
23 //-----
24 WiFiClient wificlient; // creating the instance for wificlient
25 PubSubClient client(server, 1883, callback, wificlient); //calling the pubsub client
26
```

Simulation

00:18.047 102%

object is near  
Sending payload: {"distance":0.00,"object":"Near"}  
Publish ok  
Distance in cm 0.00  
object is near  
Sending payload: {"distance":0.00,"object":"Near"}  
Publish ok

## DatasenttotheIBMCloudDevicewhentheobjectisnear



IBM Watson IoT Platform

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ID: 9ut565

Browse Action Device Types Interfaces

Add Device +

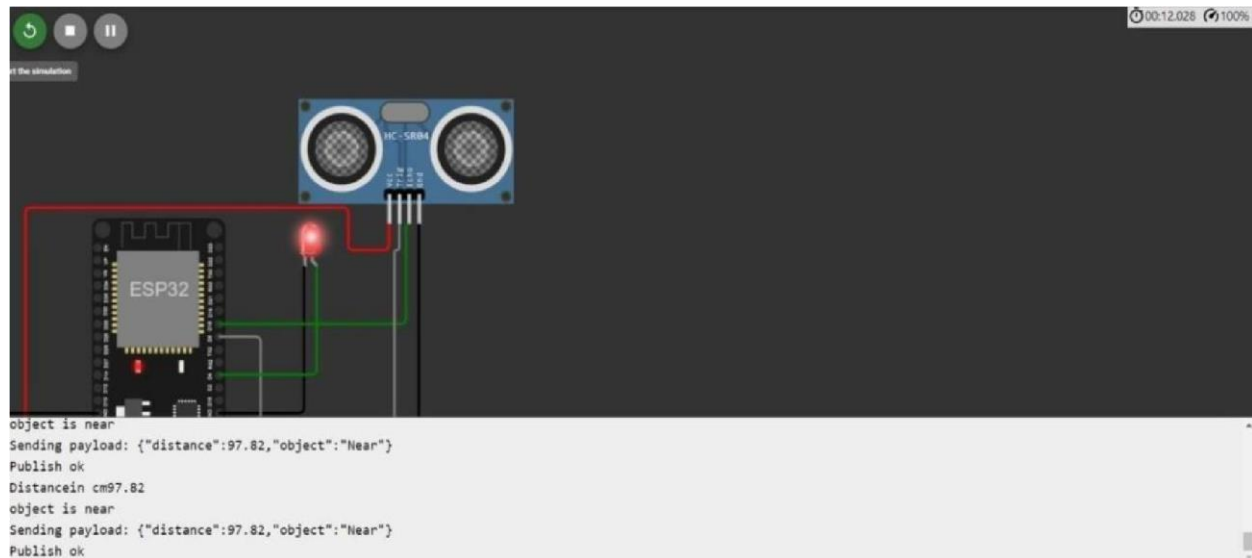
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Identity Device Information Recent Events State Logs

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\":0,\"object\":\"Near\"}	json	a few seconds ago
Data	{\"distance\":0,\"object\":\"Near\"}	json	a few seconds ago

## Whenobjecticsneartotheultrasonicsensor



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