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 100cmssend"alert"toibmcloudanddisplayindevicerecentevents.

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;
```

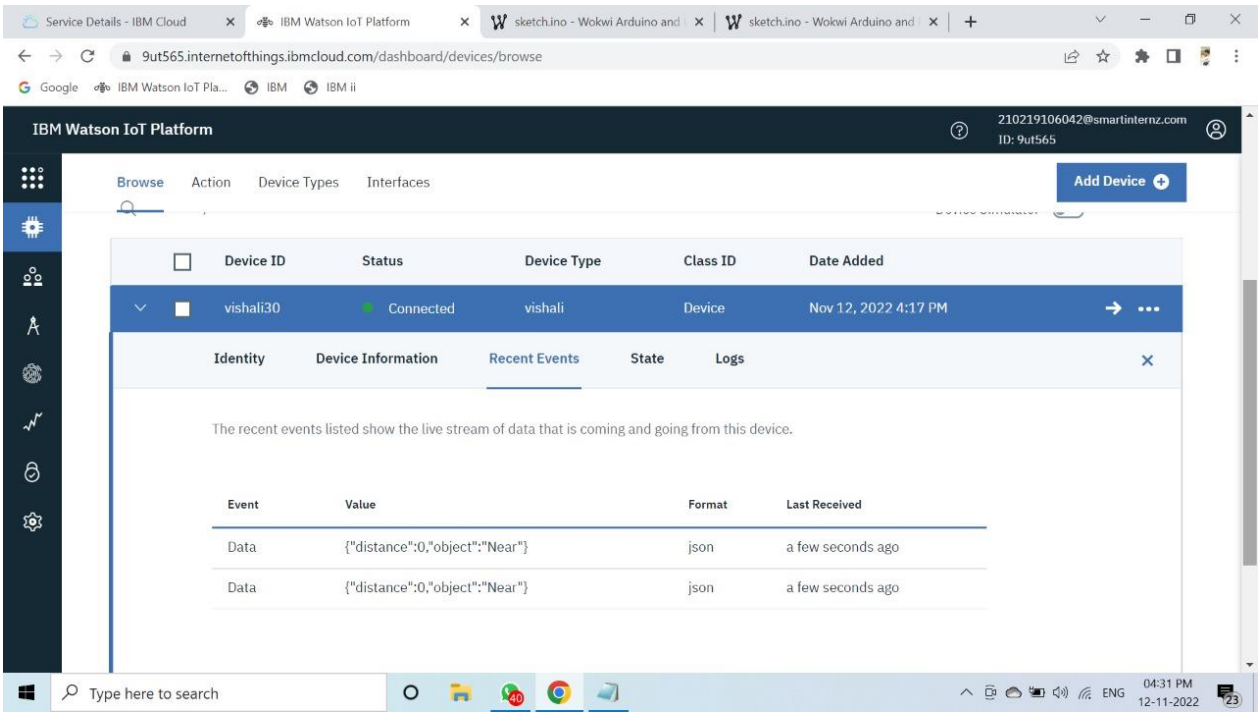
```
 Serial.print ("Distancein cm");
 Serial.println(dist);



 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);
```

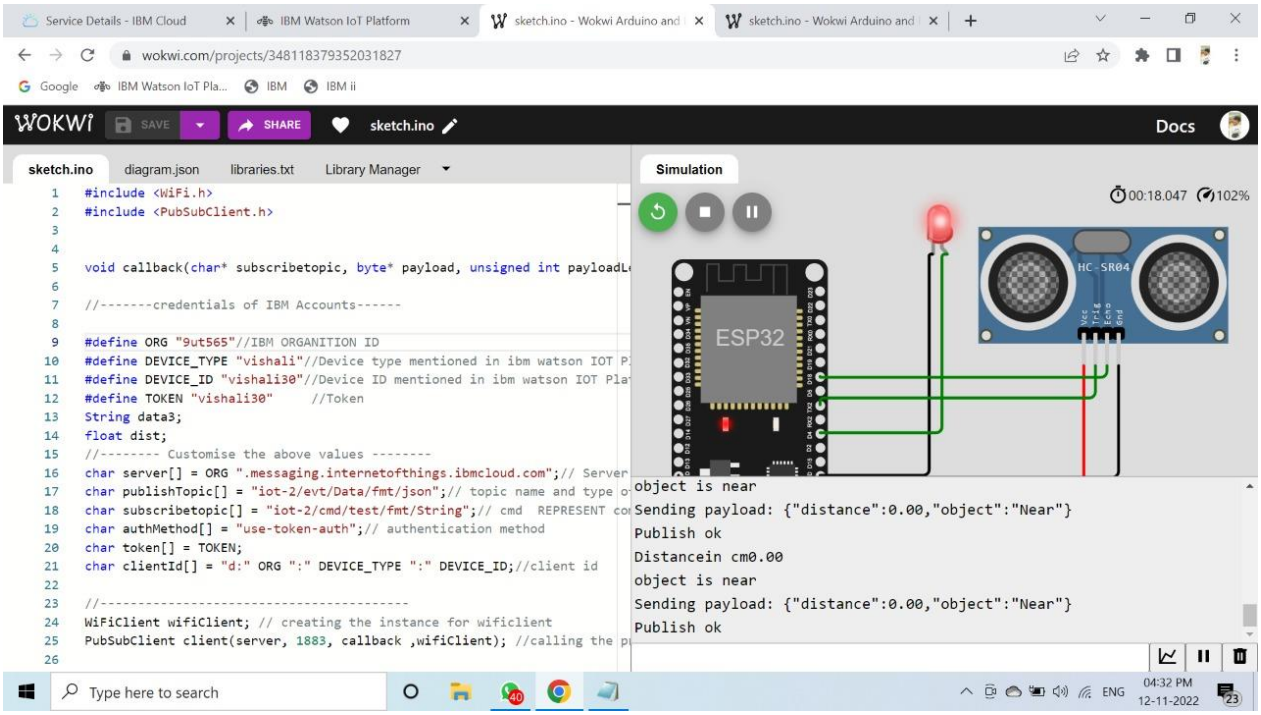
```
   while (!!!client.connect(clientId, authMethod, token)) {
Serial.print(".");      delay(500);
   }
    initManagedDevice();
    Serial.println();
 }
}
void wificonnect() //function defination for wificonnect
{
 Serial.println();
 Serial.print("Connecting to ");

 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="";
}
```

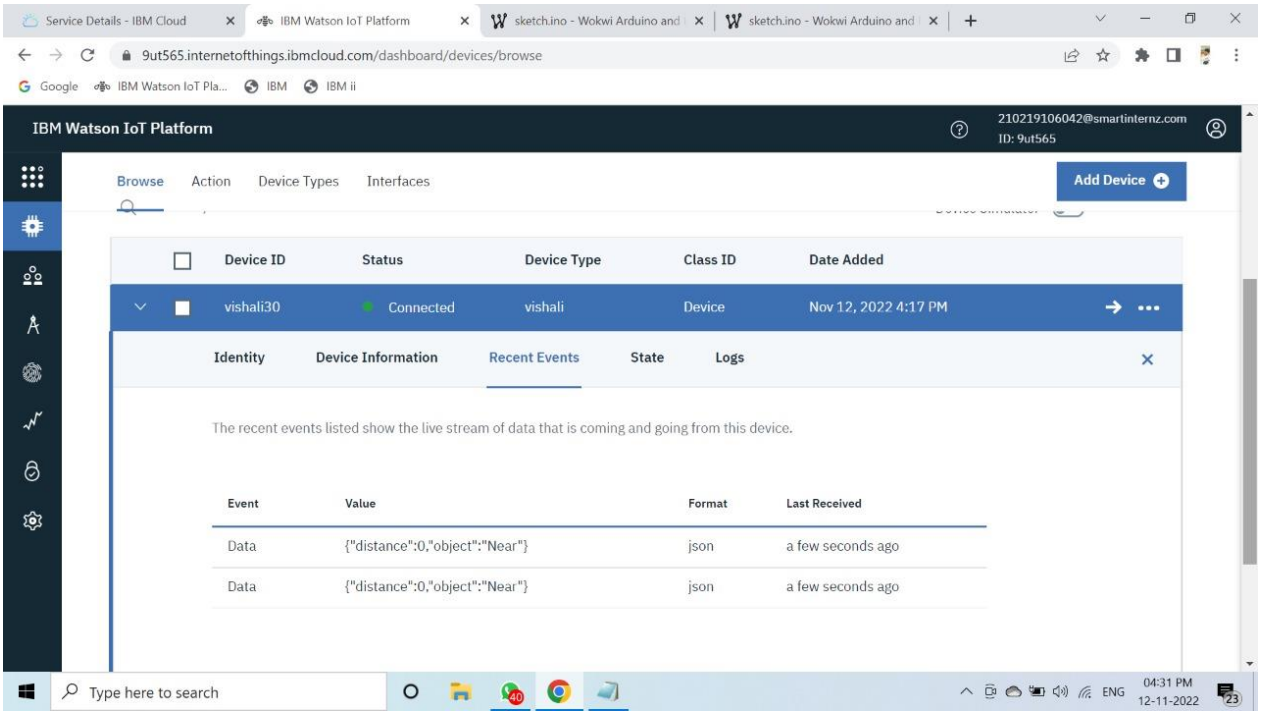
OUTPUT:



Data send to the IBM cloud device when the objecticsfar



DatasenttotheIBMCloudDevicewhentheobjectisnear



Whenobjecticsneartotheultrasonicsensor