ASSIGNMENT 4

Distance Detection Using Ultrasonic Sensor Assignment Date	5 November 2022
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Maximum Marks	2 Marks

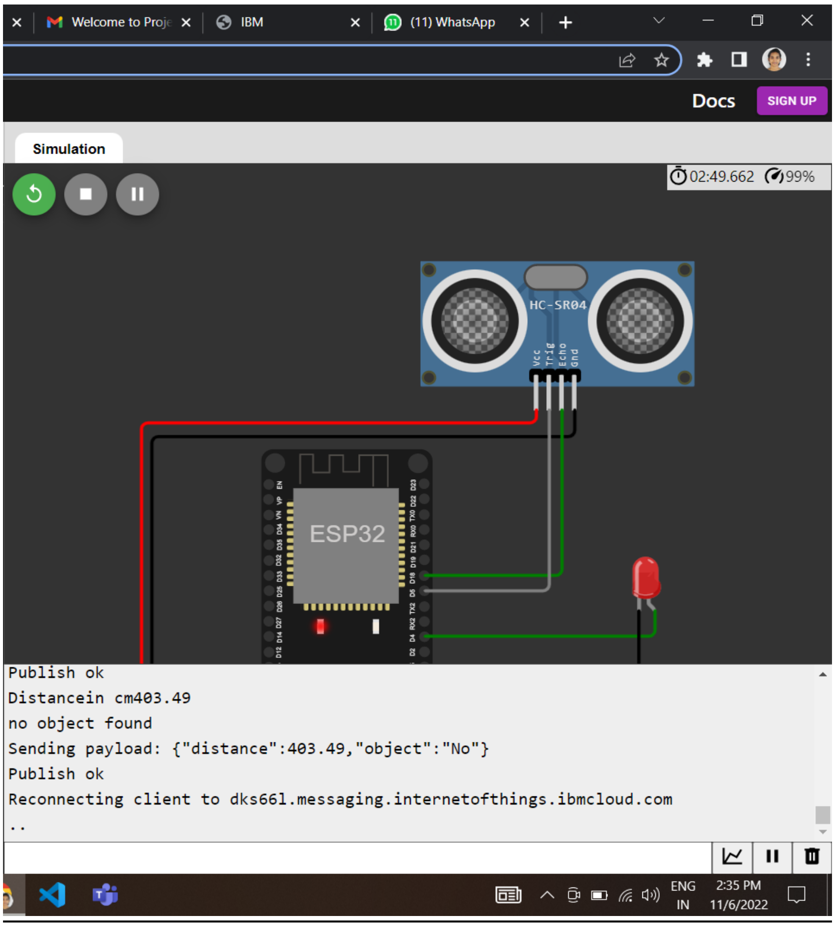
WOKWI CODE:

```
#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 "dks66l"//IBM ORGANITION ID

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

#define DEVICE_ID "45"//Device ID mentioned in ibm watson IOT Platform

#define TOKEN "sudha2002@"     //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 ");
```

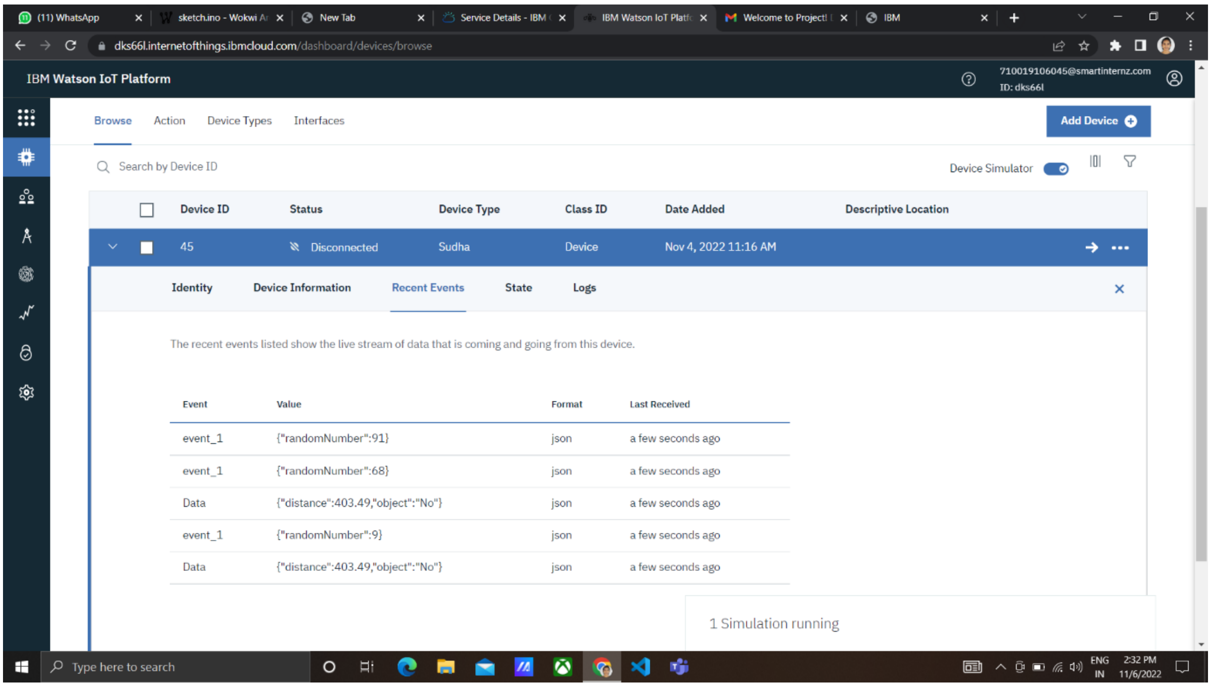
WOKWI LINK: https://wokwi.com/projects/347567837551788626

WOKWI CIRCUIT DIAGRAM AND WOKWI OUTPUT:



```
Publish ok
Distancein cm403.49
no object found
Sending payload: {"distance":403.49,"object":"No"}
Publish ok
Reconnecting client to dks661.messaging.internetofthings.ibmcloud.com
..
```

IBM WATSON OUTPUT:



Device ID	Status	Device Type	Class ID	Date Added	Descriptive Location
45	Disconnected	Sudha	Device	Nov 4, 2022 11:16 AM	

The recent events listed show the live stream of data that is coming and going from this device.

Event	Value	Format	Last Received
event_1	{"randomNumber":91}	json	a few seconds ago
event_1	{"randomNumber":68}	json	a few seconds ago
Data	{"distance":403.49,"object":"No"}	json	a few seconds ago
event_1	{"randomNumber":9}	json	a few seconds ago
Data	{"distance":403.49,"object":"No"}	json	a few seconds ago

1 Simulation running