Distance Detection Using Ultrasonic Sensor Assignment Date	5 November 2022
Student Name	Mukil Arasi S
Student Roll Number	710019106030
Maximum Marks	2 Marks

ASSIGNMENT 4

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 " vrpc8b "//IBM ORGANITION ID
#define DEVICE_TYPE " Ecedevice "//Device type mentioned in ibm watson IOT Platform
#define DEVICE_ID "123456"//Device ID mentioned in ibm watson IOT Platform
#define TOKEN " Mukil@12"     //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);

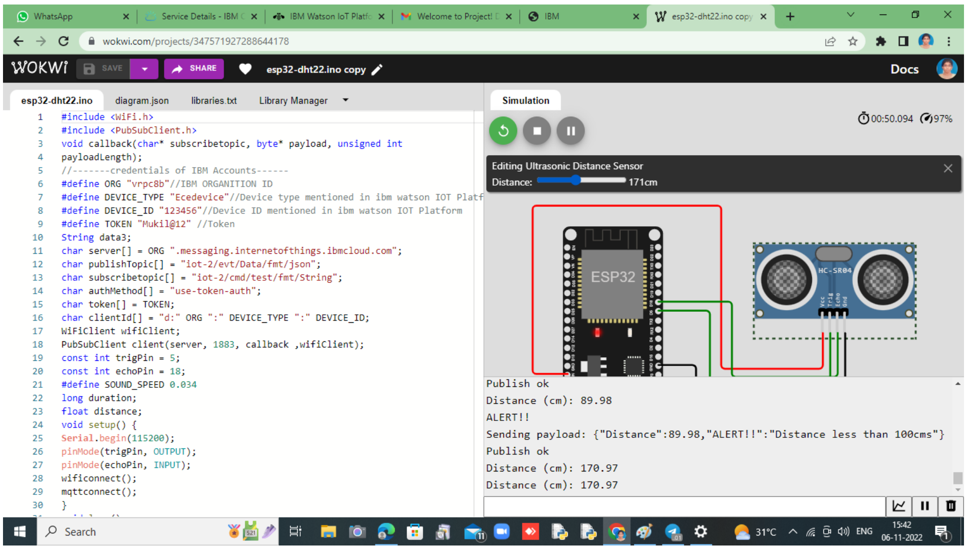

//  }


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


//  }
data3="";
}
```

WOKWI LINK: https://wokwi.com/projects/347571927288644178

WOKWI CIRCUIT DIAGRAM AND WOKWI OUTPUT:



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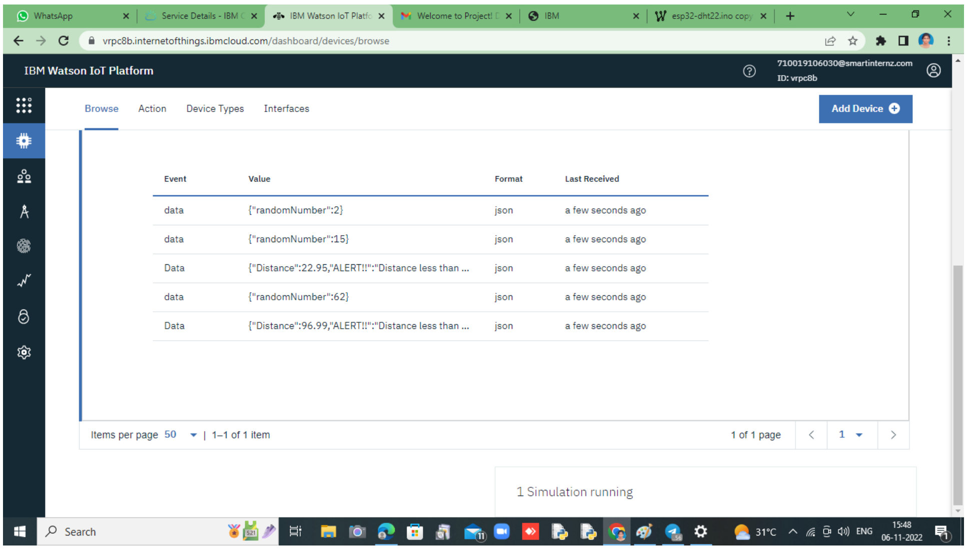
String data3;
char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
char publishTopic[] = "iot-2/evt/Data/fmt/json";
char subscribetopic[] = "iot-2/cmd/test/fmt/String";
char authMethod[] = "use-token-auth";
char token[] = TOKEN;
char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;
WiFiClient wifiClient;
PubSubClient client(server, 1883, callback ,wifiClient);
const int trigPin = 5;
const int echoPin = 18;
#define SOUND_SPEED 0.034
long duration;
float distance;
void setup() {
Serial.begin(115200);
pinMode(trigPin, OUTPUT);
pinMode(echoPin, INPUT);
wificonnect();
mqttconnect();
}
```

```
Publish ok
Distance (cm): 89.98
ALERT!!
Sending payload: {"Distance":89.98,"ALERT!!":"Distance less than 100cms"}
Publish ok
Distance (cm): 170.97
Distance (cm): 170.97
```

IBM WATSON OUTPUT:



IBM Watson IoT Platform
vrpc8b.internetofthings.ibmcloud.com/dashboard/devices/browse
710019106030@smartinternz.com
ID: vrpc8b
Browse
Action
Device Types
Interfaces
Add Device

Event	Value	Format	Last Received
data	{"randomNumber":2}	json	a few seconds ago
data	{"randomNumber":15}	json	a few seconds ago
Data	{"Distance":22.95,"ALERT!!":"Distance less than ...	json	a few seconds ago
data	{"randomNumber":62}	json	a few seconds ago
Data	{"Distance":96.99,"ALERT!!":"Distance less than ...	json	a few seconds ago

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1 Simulation running