ASSIGNMENT 4

Distance Detection Using Ultrasonic Sensor Assignment Date	5 November 2022
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Student Roll Number	710019106033
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 "3lzyat"//IBM ORGANITION ID
#define DEVICE_TYPE "Test"//Device type mentioned in ibm watson IOT Platform
#define DEVICE_ID "1"//Device ID mentioned in ibm watson IOT Platform
#define TOKEN "Nishanth77@@"     //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
```

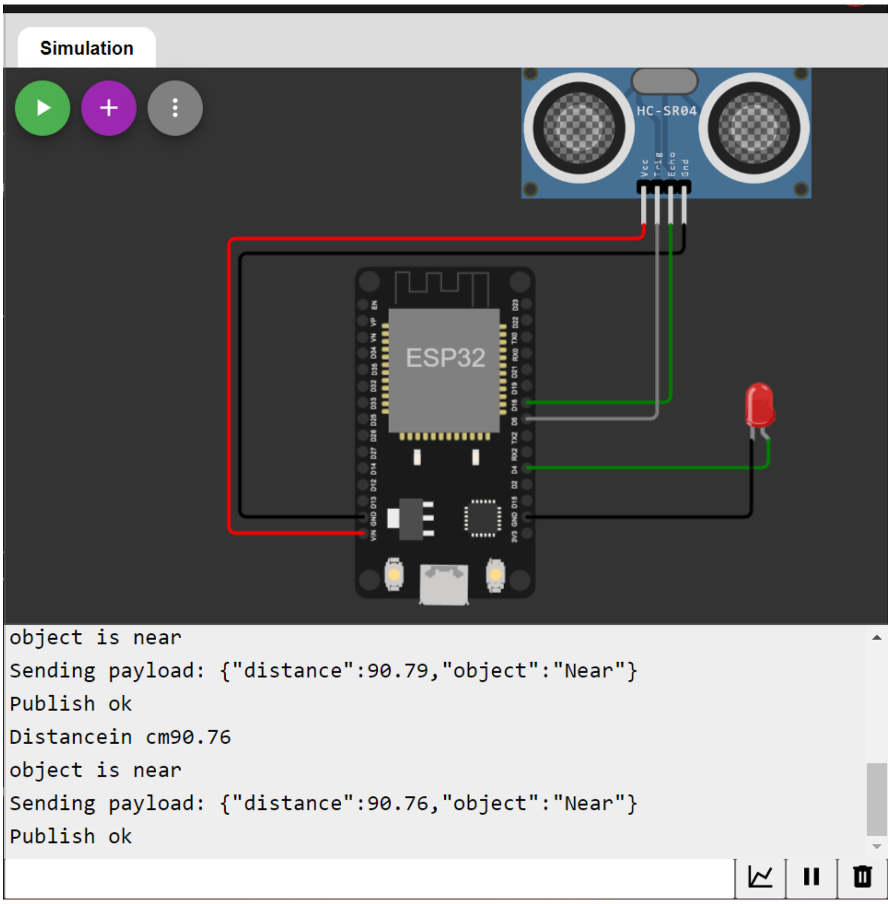
```
int LED = 4;
int trig = 5;
int echo = 18;
void setup()
{
Serial.begin(115200);
pinMode(trig,OUTPUT);
pinMode(echo,INPUT);
pinMode(LED, OUTPUT);
delay(10);
wificonnect();
mqttconnect();
}
void loop()// Recursive Function
{

 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="";

}
```

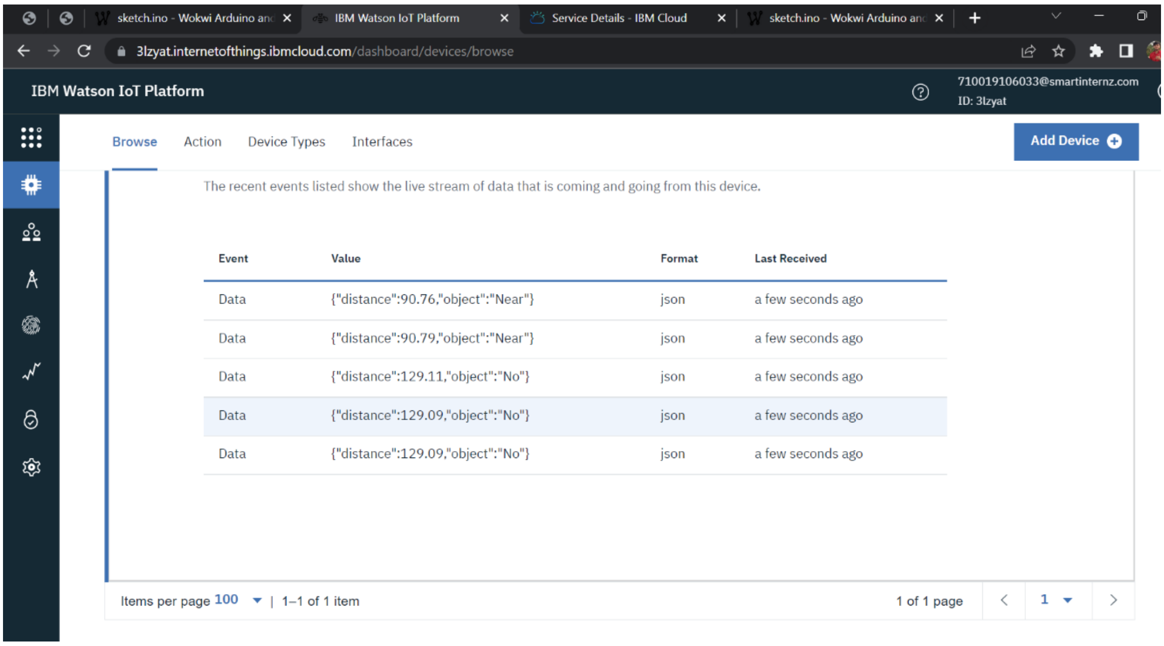
WOKWI LINK: https://wokwi.com/projects/347508537829622356

WOKWI CIRCUIT DIAGRAM AND WOKWI OUTPUT:



```
object is near
Sending payload: {"distance":90.79,"object":"Near"}
Publish ok
Distancein cm90.76
object is near
Sending payload: {"distance":90.76,"object":"Near"}
Publish ok
```

IBM WATSON OUTPUT:


sketch.ino - Wokwi Arduino anc
IBM Watson IoT Platform
Service Details - IBM Cloud
sketch.ino - Wokwi Arduino anc
3lzyat.internetofthings.ibmcloud.com/dashboard/devices/browse
IBM Watson IoT Platform
710019106033@smartinternz.com
ID: 3lzyat
Browse
Action
Device Types
Interfaces
Add Device

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":90.76,"object":"Near"}	json	a few seconds ago
Data	{"distance":90.79,"object":"Near"}	json	a few seconds ago
Data	{"distance":129.11,"object":"No"}	json	a few seconds ago
Data	{"distance":129.09,"object":"No"}	json	a few seconds ago
Data	{"distance":129.09,"object":"No"}	json	a few seconds ago