Assignment -4

Distance Detection Using Ultrasonic Sensor

Assignment Date	05 November 2022
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Maximum Marks	2 Marks

Question-1:

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

WOKWI LINK: **https://wokwi.com/projects/347511410625872468**

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 "40krha"//IBM ORGANITION ID

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

 #define DEVICE_ID "028"//Device ID mentioned in ibm watson IOT Platform

 #define TOKEN "monish@123"     //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()) {
```

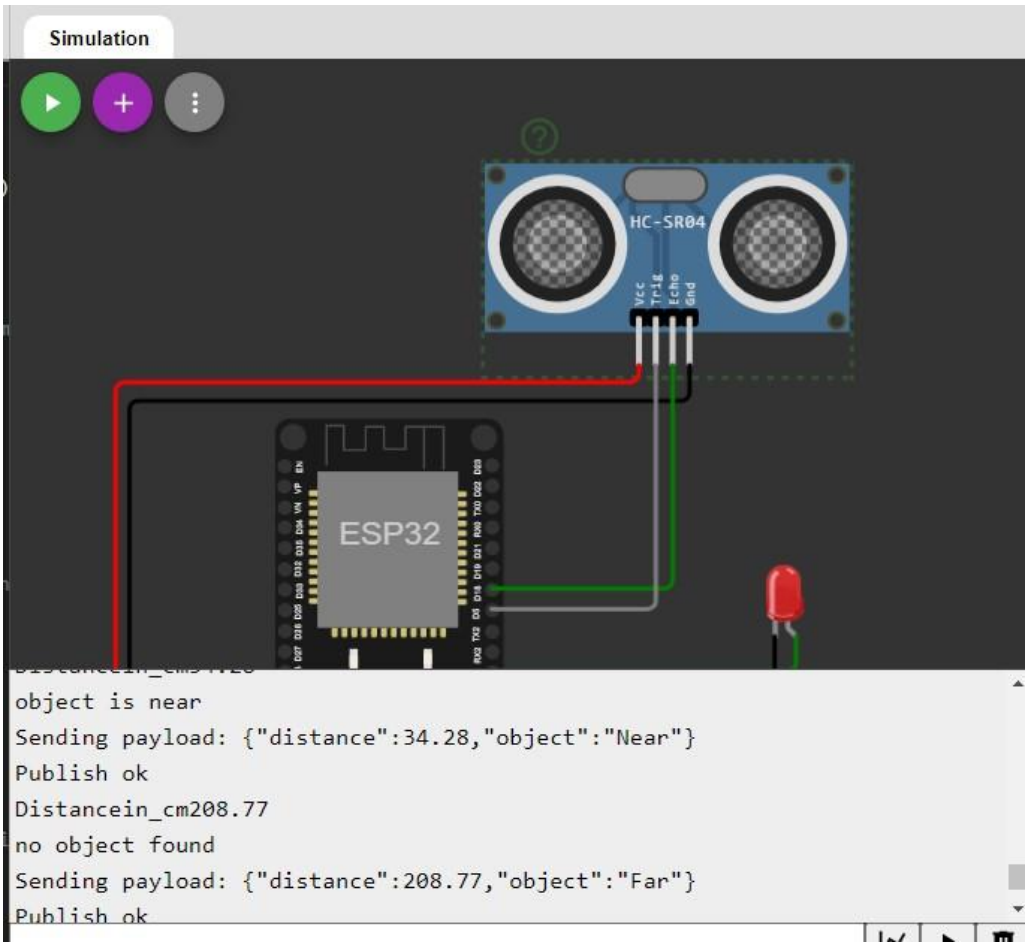
```
mqttconnect();
}
}
/*.....retrieving to Cloud.....*/
void PublishData(float dist) {
mqttconnect();//function call for connecting to ibm
 /*
creating the String in in form JSon to update the data to ibm cloud
 */
 String object;
 if (dist <100)
 {
 digitalWrite(LED,HIGH);
 Serial.println("object is near");
object = "Near";
 }
 else
 {
digitalWrite(LED,LOW);
Serial.println("no object found");
 object = "Far";
}

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 CIRCUIT DIAGRAM AND WOKWI OUTPUT:



IBM WATSON OUTPUT: