Assignment –4

ASSIGNMENT DATE	31 OCT 2022
STUDENT NAME	MUGESH M
STUDENT ROLL NUMBER	910019104026
MAXIMUM MARK	2 MARKS

Question :

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

Code:

```
#include <Wifi.h>
 #include<PubSubClient.h>
 void callback(char* subscribetopic, byte* payload, unsigned int payloadLength);
 //-------credentials of IBM Accounts------
 #define ORG "kotoq5
"//IBM ORGANITION ID
 #define DEVICE_TYPE "ESP32"
//Device type mentioned in ibm watson IOT Platform
 #define DEVICE_ID "12345"
//Device ID mentioned in ibm watson IOT Platform
 #define TOKEN "12345678"
 //Token
 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;
```

```cpp
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();
 }
void loop()
{
digitalWrite(trigPin, LOW);
 delayMicroseconds(2);
digitalWrite(trigPin, HIGH);
delayMicroseconds(10);
 digitalWrite(trigPin, LOW);
duration = pulseIn(echoPin, HIGH);
distance = duration * SOUND_SPEED/2;
 Serial.print("Distance (cm): ");
Serial.println(distance);
 if(distance<100)
{
```

```cpp
Serial.println("ALERT!!");

 delay(1000);

PublishData(distance) ;

delay(1000);

if (!client.loop()) {

mqttconnect();

}

}

 delay(1000);

}

void PublishData(float dist)

{

mqttconnect();

 String payload = "{\"Distance\":";

 payload += dist;

 payload += ",\"ALERT!!\":""\"Distance less than 100cms\"";

 payload += "}";

 Serial.print("Sending payload: ");

 Serial.println(payload);

 if (client.publish(publishTopic, (char*) payload.c_str()))

 {

 Serial.println("Publish ok");

 }

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()
 {
Serial.println();
Serial.print("Connecting to ");
WiFi.begin("Wokwi-GUEST", "", 6);
 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);
data3=""; } Diagram.json:
{
"version": 1,
"author": "sweetysharon",
"editor": "wokwi",
"parts": [
{ "type": "wokwi-esp32-devkit-v1", "id": "esp", "top": -4.67, "left": -114.67, "attrs": {} },
{ "type": "wokwi-hc-sr04", "id": "ultrasonic1", "top": 15.96, "left": 89.17, "attrs": {} }
```
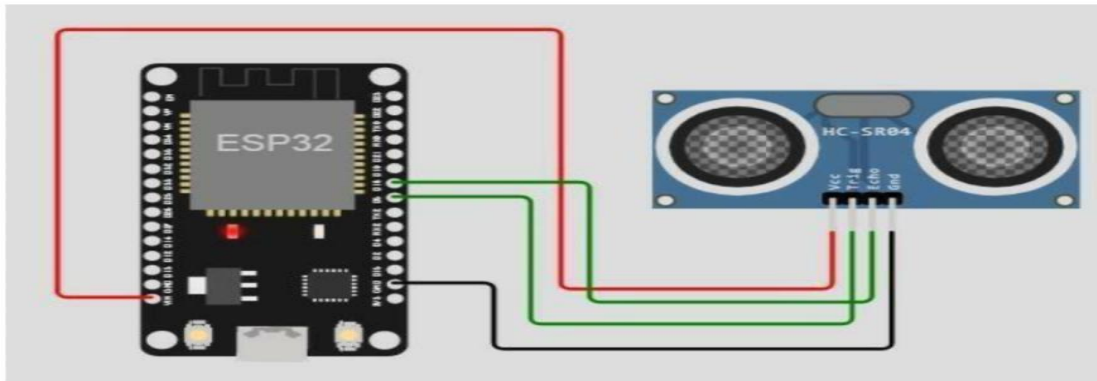
],

 "connections": [

 ["esp:TX0", "$serialMonitor:RX", "", []],

 ["esp:RX0", "$serialMonitor:TX", "", []],

 [

"esp:VIN",

 "ultrasonic1:VCC" ,

 "red",

 ["h-37.16", "v-178.79", "h200", "v173.33", "h100.67"]

],

 ["esp:GND.1", "ultrasonic1:GND", "black", ["h39.87", "v44.04", "h170"]],

 ["esp:D5", "ultrasonic1:TRIG", "green", ["h54.54", "v85.07", "h130.67"]],

 ["esp:D18", "ultrasonic1:ECHO", "green", ["h77.87", "v80.01", "h110"]]

]

}

Circuit Diagram:

Output:
Wokwi output:

```
Connecting to ....
WiFi connected
IP address:
10.10.0.2
Reconnecting client to ytluse.messaging.internetofthings.ibmcloud.com
iot-2/cmd/test/fmt/String
subscribe to cmd OK

Distance (cm): 399.92
Distance (cm): 399.96
Distance (cm): 399.94
Distance (cm): 399.98
Distance (cm): 399.94
Distance (cm): 399.92
Distance (cm): 399.94
```

IBM cloud output:

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	{"distance":7,"Alert":"Distance less than 10"}	json	a few seconds ago
event_1	{"distance":9,"Alert":"Distance less than 10"}	json	a few seconds ago
event_1	{"distance":8,"Alert":"Distance less than 10"}	json	a few seconds ago
event_1	{"distance":9,"Alert":"Distance less than 10"}	json	a few seconds ago