Assignment -4
Ultrasonic Sensor

Assignment Date	10 November 2022
Student Name	Mr. Sham Ganesh
Student Roll Number	2019503559
Maximum Marks	2 Marks

Question-1:

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

Source Code:

```
#include <WiFi.h>
#include <PubSubClient.h>
void callback(char* subscribetopic, byte* payload, unsigned int payloadLength);
#define ORG "ir6i2l"
#define DEVICE_TYPE "node_assgn4"
#define DEVICE_ID "73585"
#define TOKEN "91766210"
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();
}
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): ");
```

```arduino
Serial.println(distance);
if(distance<100)
{
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());
}
```
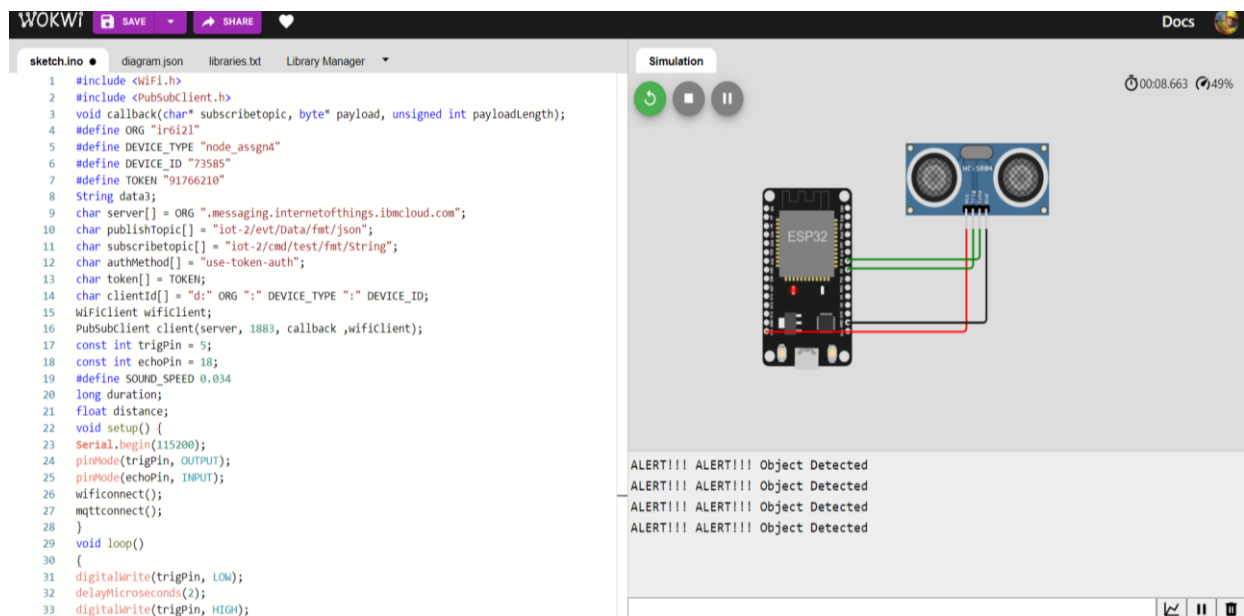
```
void initManagedDevice() {
if (client.subscribe(subscribetopic)) {
Serial.println((subscribetopic));
Serial.println("subscribe to cmd OK");
} else {
Serial.println("subscribe to cmd FAILED");
}
}
void callback(char* subscribetopic, byte* payload, unsigned int payloadLength)
{
Serial.print("callback invoked for topic: ");
Serial.println(subscribetopic);
for (int i = 0; i < payloadLength; i++)
{
data3 += (char)payload[i];
}
Serial.println("data: "+ data3);
data3="";
}
```

Output:

Browse   Action   Device Types   Interfaces

Add Device ⊕

Q Search by Device ID

Device Simulator ◉

		Device ID	Status	Device Type	Class ID	Date Added	Descriptive Location
›	☐	73585	Disconnected	DeviceNode	Device	Nov 22, 2022 10:35 PM	
›	☐	73585	Disconnected	NodeMCU	Device	Nov 21, 2022 10:52 PM	
⌄	■	73585	Disconnected	node_assgn4	Device	Nov 25, 2022 10:41 AM	→ ···

Identity   Device Information   Recent Events   State   Logs   ✕

Device ID   73585
Device Type   node_assgn4
Date Added   Nov 25, 2022 10:41 AM
Added By   2019503559@smartinternz.com
Connection Status   Disconnected

2 Simulations running

| › | ☐ | abcd_1 | Disconnected | abcd | Device | N... |

Browse   Action   Device Types   Interfaces

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Identity   Device Information   Recent Events   State   Logs

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	{"ALERT!!!ALERT!!!object Detected":38}	json	a few seconds ago
event_1	{"ALERT!!!ALERT!!!object Detected":2}	json	a few seconds ago
event_1	{"ALERT!!!ALERT!!!object Detected":100}	json	a few seconds ago
event_1	{"ALERT!!!ALERT!!!object Detected":74}	json	a few seconds ago
event_1	{"ALERT!!!ALERT!!!object Detected":82}	json	a few seconds ago