

## ASSIGNMENT 4

|              |  |
|--------------|--|
| Date         | 30 October 2022                                      |
| REG number   | 110319106046   |
| Student Name | UMAPATHY A V   |
| Project Name | SmartFarmer – IoT Enabled Smart Farming Application. |

### QUESTION:

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.

### CODE:

```
#include <WiFi.h>
#include <PubSubClient.h>
void callback(char* subscribetopic, byte* payload, unsigned int
payloadLength);
//-----credentials of IBM Accounts-----
#define ORG "qsnm12"//IBM ORGANITION ID
#define DEVICE_TYPE "arduino"//Device type mentioned in ibm watson IOT Platform
#define DEVICE_ID "lp10"//Device ID mentioned in ibm watson IOT Platform
#define TOKEN "110319106046" //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;
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)
{
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");
}
}
}

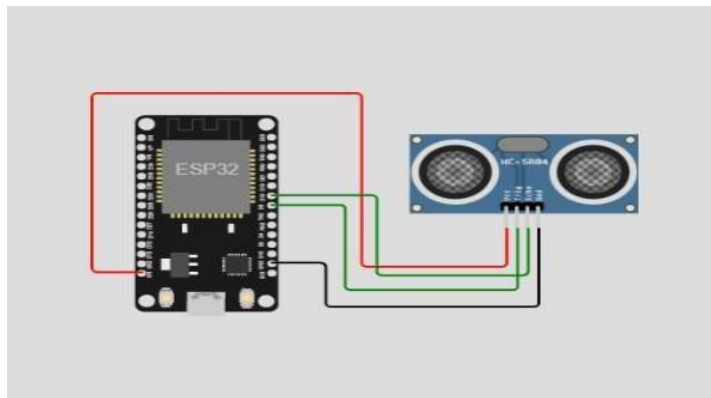
```

```

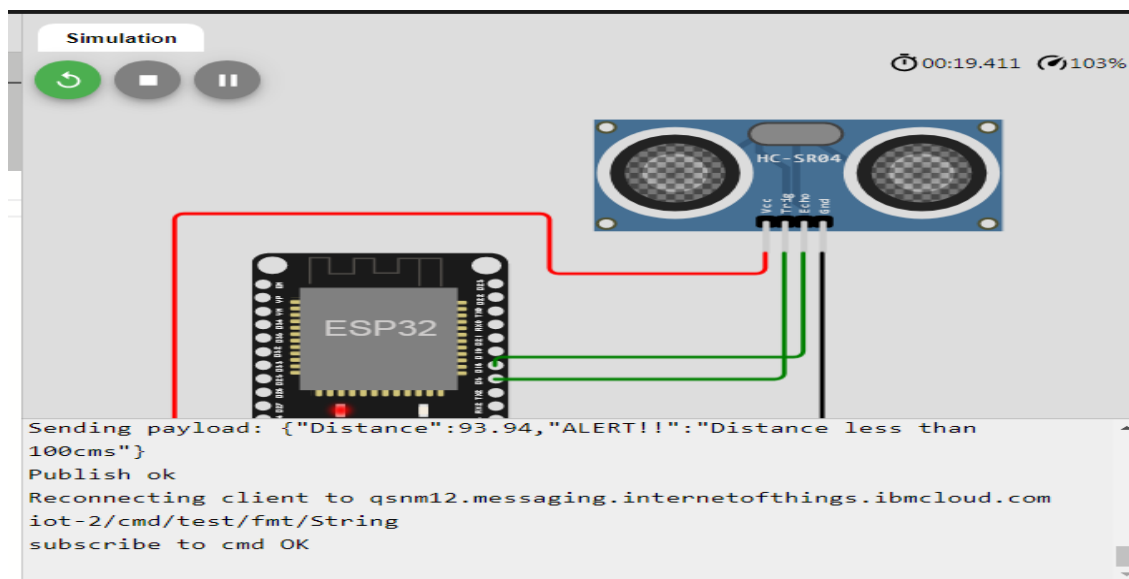
void callback(char* subscribetopic, byte* payload, unsigned int payloadLength)
{
  Serial.print("callback invoked for topic: ");
  Serial.println(subscribetopic);
  for (int i = 0; i < payloadLength; i++) {
    //Serial.print((char)payload[i]);
    data3 += (char)payload[i];
  }
  Serial.println("data: " + data3);
  data3="";
}

```

## SCHEMATIC/CIRCUIT DIAGRAM



## OUTPUT DIAGRAM:



## IBM CLOUD OUTPUT:

| 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     |      |
| Data   | {"Distance":93.99,"ALERT!!":"Distance less than ... | json          | a few seconds ago |      |
| Data   | {"Distance":61.97,"ALERT!!":"Distance less than ... | json          | a few seconds ago |      |
| Data   | {"Distance":47.97,"ALERT!!":"Distance less than ... | json          | a few seconds ago |      |
| Data   | {"Distance":47.97,"ALERT!!":"Distance less than ... | json          | a few seconds ago |      |

## WOKWI LINK:

<https://wokwi.com/projects/348561055246451284>