ASSIGNMENT 4

Date	**26 October 2022**
Team ID	**PNT2022TMID46042**
Project Name	**Smart Waste Management System for Metropolitan Cities**

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:

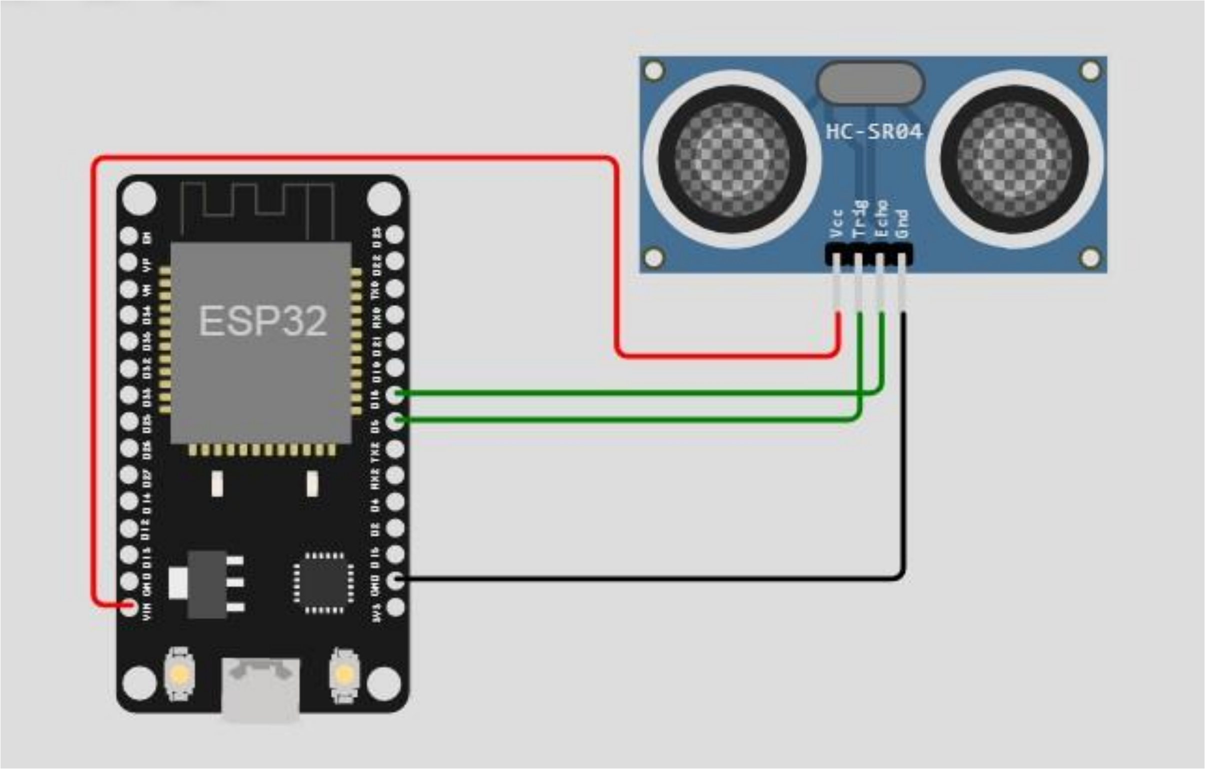
```
#include <WiFi.h> #include
<PubSubClient.h> void callback(char*
subscribetopic, byte* payload, unsigned
int payloadLength);
//-------credentials of IBM Accounts------
#define ORG "u9pz01"//IBM ORGANITION ID
#define DEVICE_TYPE "ultrasensor"//Device type
mentioned in ibm watson IOT Platform #define
DEVICE_ID "123"//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[] =
"iot2/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;
```

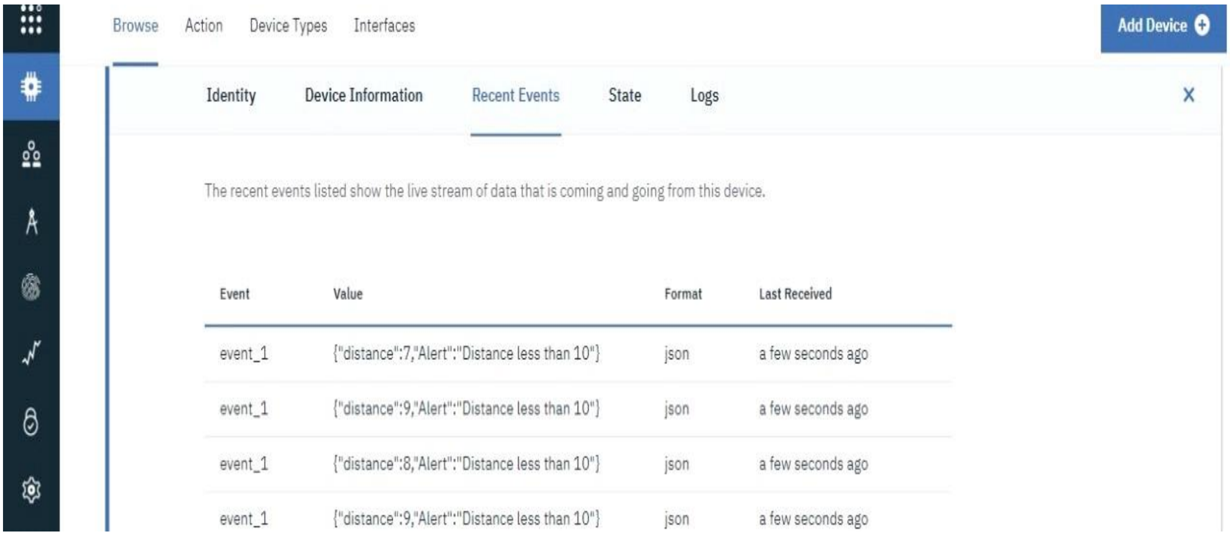
```
Serial.print("Distance (cm): ");
Serial.println(distance); if(distance<100)
{
Serial.println("ALERT!!");
delay(1000);
PublishData(distance);
delay(1000); if
(!client.loop()) {
mqttconnect();
} } delay(1000); } void
PublishData(float dist) {
mqttconnect();
String payload = "{\"Distance\":"; payload
+= 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:



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

WOKWI LINK:

https://wokwi.com/projects/346500826401866324