Assignment-4

Project title	Smart Waste Management System for Metropolitan Cities
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Write a code and connections in working for the ultrasonic sensor. Whenever the distance is less than 100 cms send an “Alert” to IBM cloud and display in the device recent events.

Code:

```
#include
<WiFi.h>
#include
<PubSubClient.h>
void callback(char* subscribe topic, byte* payload, unsigned int
payloadLength);
//-------credentials of IBM Accounts------
#define ORG "kotoq5"//IBM ORGANIZATION 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 subscribe topic[]
="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;
```

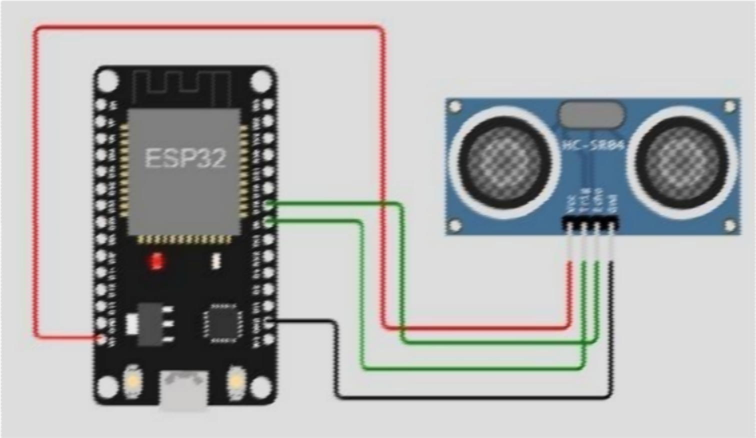
```
void setup()
{
Serial.begin(1152
00);
pinMode(trigPin,
OUTPUT);
pinMode(echoPin,
INPUT); wifi
connect(); mqtt
connect();
}
void loop()
{
digitalWrite(trigPin, LOW);
delayMicroseconds(2);
digitalWrite(trigPin,
HIGH);
delayMicroseconds(10);
digitalWrite(trigPin, LOW);
duration = pulseIn(echoPin,
HIGH); distance = duration
* SOUND_SPEED/2;
Serial.print("Distance
(cm): ");
Serial.println(distance);
if(distance<100)
{
Serial.println("ALERT!!"
);
delay(1000);
PublishData(di
stance);
delay(1000);
if (!client.loop())
{ mqtt connect();
}
}
delay(1000);
}
void PublishData(float dist)
{ mqtt connect();
String payload =
"{\"Distance\":"; payload
+= dist;
payload += ",\"ALERT!!\":""\"Distance less than
100 cms\""; 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 mqtt connect() {
 if (!client.connected())
 { Serial.print("Reconnecting
 client to ");
 Serial.println(server);
 while (!!!client.connect(clientId, authMethod, token))
 {
 Serial.print
 (".");
 delay(500);
 }
 initManagedD
 evice();
 Serial.print
 ln();
 }
 }
 void wifi connect()
 {
 Serial.println();
 Serial.print("Connecting to
 "); WiFi.begin("Wokwi-GUEST",
 "", 6); while (WiFi.status()
 != WL_CONNECTED)
 {
 delay(500)
 ;
 Serial.pri
 nt(".");
 }
 Serial.println("");
 Serial.println("WiFi
 connected");
 Serial.println("IP
 address: ");
 Serial.println(WiFi.local
 IP());
 }
 void initManagedDevice() {
 if (client.subscribe(subscribe topic))
 { Serial.println((subscribe
 topic));
 Serial.println("subscribe to
 cmd OK");
} else {
Serial.println("subscribe to cmd FAILED");
}
}
void callback(char* subscribe topic, 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": "Rithick
  Kumar ", "editor":
  "working", "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",
      "ultrasoni
      c1: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", "ultrasonic:ECHO", "green", [ "h77.87", "v80.01", "h110" ] ]
  ]
}
```

Circuit Diagram:



Output:

Working output: