

ASSIGNMENT 4

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| Date | 26 October 2022 |
| Team ID | PNT2022TMID33826 |
| 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[] = "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 {

```

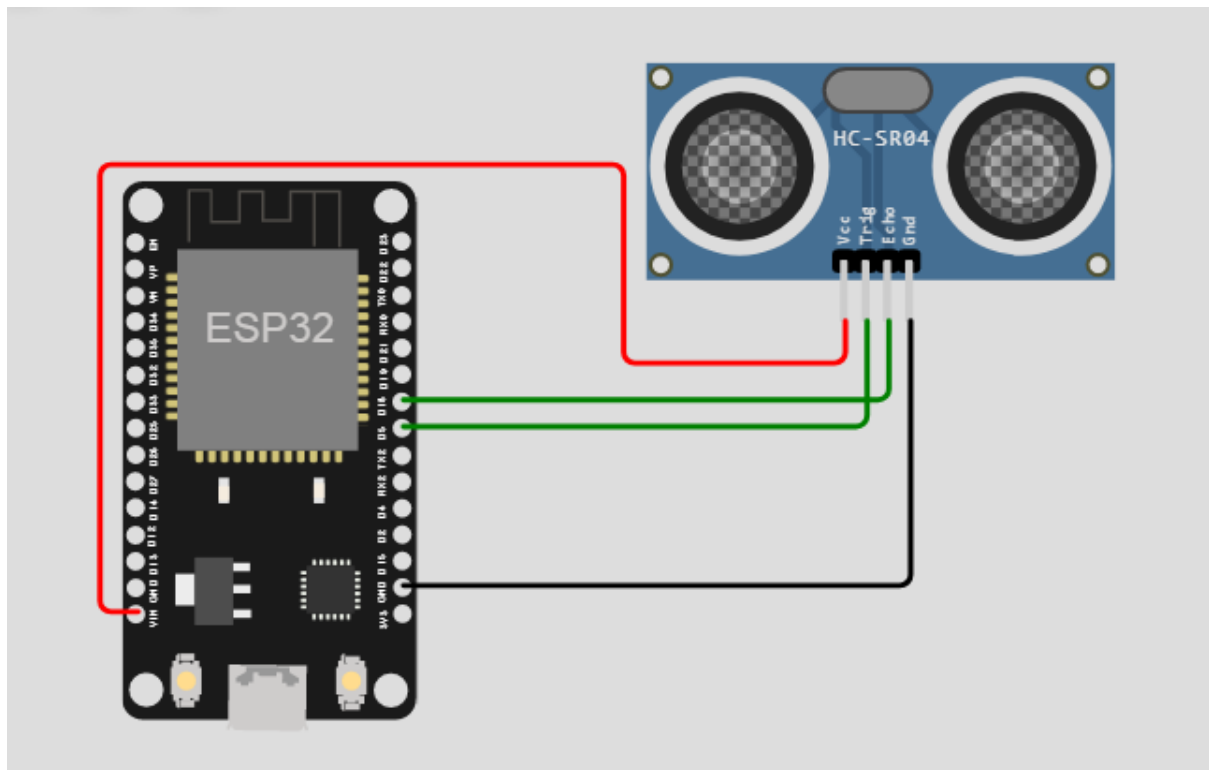
```
Serial.println("Publish failed");
}
}
void mqttconnect() {
if (!client.connected()) {
Serial.print("Reconnecting client to ");
Serial.println(server);
while (!!!client.connect(clientId, authMethod,
token)) {
Serial.print(".");
delay(500);
}
initManagedDevice();
Serial.println();
}
}
void wificonnect()
{
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:



IBM CLOUD OUTPUT:

| <div> <div></div> <div>Browse Action Device Types Interfaces</div> <div>Add Device +</div> </div> | | | | |
|---|--|--------|-------------------|--|
| <div> <div>Identity</div> <div>Device Information</div> <div>Recent Events</div> <div>State</div> <div>Logs</div> <div>X</div> </div> | | | | |
| 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>