

## Assignment-4

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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.

### PROGRAM:

```
#include <WiFi.h>//library for wifi
#include <PubSubClient.h>//library
for MQTT #define ORG "q1wscz"
#define DEVICE_E
"sampledevice" #define
DEVICE_D "24052002"
#define TOKEN
"K9)l1C@tX6yO(J6L1" const int
T_PIN = 5;
const int E_PIN = 4;
char server[] = ORG ".messaging.internetofthings.ibmcloud.com";// Server
Name
char publishTopic[] = "iot-2/evt/Data/fmt/json";// topic name and type of
event perform and format in which data to be send
char subscribetopic[] = "iot-2/cmd/test/fmt/String";// cmd
REPRESENT command type AND COMMAND IS TEST OF
FORMAT STRING
char authMethod[] = "use-token-auth";//
authentication method char token[] = TOKEN;
char clientId[] = "d:" ORG ":" DEVICE_E ":" DEVICE_D;//client id
WiFiClient; // creating the instance for wificlient
...
PubSubClient client(server, 1883, wifiClient); //calling the predefined client
id by passing parameter like server id,portand wificredential
void setup()
```

```

Serial.begin(115200)
; pinMode(T_PIN,
OUTPUT);
pinMode(E_PIN,
INPUT);
wificonnect();
mqttconnect();
}
float
  readDistanceCM()
{
  digitalWrite(T_PIN
, LOW);
  delayMicrosecond
s(2);
  digitalWrite(T_PIN
, HIGH);
  delayMicrosecond
s(10);
  digitalWrite(T_PIN
, LOW);
  int duration =
  pulseIn(E_PIN, HIGH);
  return duration * 0.034 /
  2;
}
void loop() {

```

```

float distance =
readDistanceCM();
Serial.print("Measured
distance: ");
Serial.println(distance);
if(distance<=100){
PublishData(distance);
}
delay(1000);
if
(!client.lo
op()) {
mqttconn
ect();
}
}
void PublishData(float distance) {
mqttconnect();//function call for connecting to ibm
bool status=true;
String payload = "{\"ALERT_MESSAGE\":\""; payload += status;
payload += "," "\"DISTANCE\":\""; payload += distance;
payload += "\"}";

Serial.print("Sending payload: "); Serial.println(payload);
if (client.publish(publishTopic, (char*) payload.c_str())) {
Serial.println("Publish ok");// if it sucessfully upload data on the cloud
then it will print publish ok in Serial monitor or else it will print publish
failed
} 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() //function defination for wificonnect
{
Serial.println(); Serial.print("Connecting to ");

WiFi.begin("Wokwi-GUEST", "", 6);//passing the wifi credentials to
establish the connection
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");
}}

```

Output:

Simulation

ESP32

HC-SR04

Publish ok  
Measured distance: 18.94  
Sending payload: {"ALERT\_MESSAGE":1,"DISTANCE":18.94}  
Publish ok  
Measured distance: 18.94  
Sending payload: {"ALERT\_MESSAGE":1,"DISTANCE":18.94}  
Publish ok