

<b>NAME</b>	<b>PRASANTHKUMAR G</b>
<b>REG NO</b>	<b>611819106036</b>
<b>PROJECT TITLE</b>	<b>REAL TIME RIVER WATER QUALITY MONITORING AND CONTROL SYSTEM</b>
<b>TOPIC</b>	<b>CONNECTIONS IN WOKWI FOR ULTRASONIC SENSOR WHENEVER THE DISTANCE IS LESS THAN 100 cms SEND AN ALERT TO IBM CLOUD</b>
<b>ASSIGNMENT</b>	<b>04</b>
<b>MENTOR</b>	<b>PRAKASAM L ASP/ECE</b>
<b>COLLEGE NAME</b>	<b>P.S.V. COLLEGE OF ENGINEERING AND TECHNOLOGY</b>

## CODE:

```
#include <WiFi.h>
#include <PubSubClient.h>
void callback(char* subscribetopic,byte* payload, unsigned int
payloadLength);
#define ORG "112t39"
#define DEVICE_TYPE "ESP32"
#define DEVICE_ID "54321"
#define TOKEN "123456789"
String data3;
char server[]= ORG ".messaging.internetofthings.ibmcloud.com";
char publishTopic[]="iot-2/evt/distance/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);
#define ECHO_PIN 2
#define TRIG_PIN 4
#define led 5
void setup() {
// put your setup code here, to run once:
Serial.begin(115200);
pinMode(led, OUTPUT);
pinMode(TRIG_PIN, OUTPUT);
pinMode(ECHO_PIN, INPUT);
wificonnect();
mqttconnect();
}
float readDistanceCM() {
digitalWrite(TRIG_PIN, LOW);
delayMicroseconds(2);
digitalWrite(TRIG_PIN, HIGH);
delayMicroseconds(10);
digitalWrite(TRIG_PIN, LOW);
int duration=random(1,200);
//Serial.println(duration);
//duration = pulseIn(ECHO_PIN, HIGH);
return duration ;
//Serial.println(duration);
}void loop() {
float distance = readDistanceCM();
//Serial.println(distance);
bool isNearby = distance < 100;
digitalWrite(led, isNearby);
Serial.print("Measured distance: ");
Serial.println(distance);
```

```

if(distance<100){
PublishData2(distance);
}else{
PublishData1(distance);
}
//PublishData(distance);
delay(1000);
if(!client.loop()){
mqttconnect();
}
//delay(2000);
}
void PublishData1(float dist){
mqttconnect();
String payload= "{\\"distance\":";
payload += dist;
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 PublishData2(float dist){
mqttconnect();
String payload= "{\\"ALERT\":";
payload += dist;
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 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++){data3 += (char)payload[i];
  }
  Serial.println("data:"+ data3);
  if(data3=="lighton"){
    Serial.println(data3);
    digitalWrite(led,HIGH);
  }else{
    Serial.println(data3);
    digitalWrite(led,LOW);
  }
  data3="";
}

```

**WOKWI LINK:**

<https://wokwi.com/projects/346683745196048979>

# WOKWI SIMULATION:

The Wokwi simulation interface displays an ESP32 microcontroller connected to an HC-SR04 ultrasonic sensor and an LED. The sketch code is as follows:

```
1 #include <WiFi.h>
2 #include <PubSubClient.h>
3 void callback(char* topic, byte* payload, unsigned int payloadLength);
4 #define ORG "112t39"
5 #define DEVICE_TYPE "ESP32"
6 #define DEVICE_ID "54321"
7 #define TOKEN "123456789"
8 String data;
9
10 char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
11 char publishTopic[] = "iot-2/evt/distance/fmt/json";
12 char subscribeTopic[] = "iot-2/cmd/distance/fmt/String";
13 char authMethod[] = "use-token-auth";
14 char token[] = TOKEN;
15 char clientId[] = "d:" + ORG + ":" + DEVICE_TYPE + ":" + DEVICE_ID;
16
17 WiFiClient wifiClient;
18 PubSubClient client(server, 1883, callback, wifiClient);
19
20 #define ECHO_PIN 2
21 #define TRIG_PIN 4
22 #define led 5
23
24 void setup() {
25   // put your setup code here, to run once:
26   Serial.begin(115200);
27   pinMode(led, OUTPUT);
28   pinMode(TRIG_PIN, OUTPUT);
29   pinMode(ECHO_PIN, INPUT);
30 }
```

The simulation output shows the following sequence of events:

```
publish ok
Measured distance: 35.00
Sending payload: {"ALERT":35.00}
publish ok
Measured distance: 52.00
Sending payload: {"ALERT":52.00}
publish ok
```

# CLOUD STORAGE:

The IBM Watson IoT Platform interface shows a device named 54321 with a status of Disconnected. The interface displays recent events and logs.

Event	Value	Format	Last Received
distance	{"distance":150}	json	a few seconds ago
distance	{"distance":187}	json	a few seconds ago
distance	{"ALERT":28}	json	a few seconds ago
distance	{"distance":191}	json	a few seconds ago
distance	{"ALERT":94}	json	a few seconds ago