

## **Delivery of Sprint-2**

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<b>PROJECT NAME</b>	SMART WASTE MANAGEMENT FOR METROPOLITAN CITIES

## **Code for Data Transfer from Sensors**

```
#include <WiFi.h> // library for wifi
#include <PubSubClient.h> // library for MQTT
#include <LiquidCrystal_I2C.h>
LiquidCrystal_I2C lcd(0x27, 20, 4);

// credentials of IBM Accounts_-----

#define ORG "ktymlx" // IBM organisation id
#define DEVICE_TYPE "new" // Device type mentioned in ibm watson iot platform
#define DEVICE_ID "09876" // Device ID mentioned in ibm watson iot platform
#define TOKEN "Kamesh@2002" // Token

// customise above values_-----

char server[] = ORG ".messaging.internetofthings.ibmcloud.com"; // server name char publishTopic[] = "iot-2/evt/data/fmt/json"; char
topic[] = "iot-2/cmd/led/fmt/String"; // cmd Represent type and command is test format of strings char authMethod[] = "usetoken-
auth"; // authentication method char token[] = TOKEN;
char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID; //Client id

// -----

WiFiClient wifiClient; // creating instance for wificlient
PubSubClient client(server, 1883, wifiClient);

#define ECHO_PIN 12
#define TRIG_PIN 13
float dist;

void setup()
{
  Serial.begin(115200); pinMode(LED_BUILTIN,
  OUTPUT); pinMode(TRIG_PIN, OUTPUT);
  pinMode(ECHO_PIN, INPUT);
  //pir pin pinMode(4, INPUT);

  //ledpins pinMode(23,
  OUTPUT); pinMode(2,
  OUTPUT); pinMode(4,
  OUTPUT);
  pinMode(15, OUTPUT);
  lcd.init(); lcd.backlight();
  lcd.setCursor(1, 0);
```

```

lcd.print("");
wifiConnect();
mqttConnect();
}

float readcmCM()
{
digitalWrite(TRIG_PIN, LOW);
delayMicroseconds(2);
digitalWrite(TRIG_PIN, HIGH);
delayMicroseconds(10);
digitalWrite(TRIG_PIN, LOW); int duration
= pulseIn(ECHO_PIN, HIGH); return
duration * 0.034 / 2;
}

void loop()
{

lcd.clear();

publishData(); delay(500);
if (!client.loop())
{
mqttConnect(); // function call to connect to IBM
}
}

/* _____-retrieving to cloud_____ */

void wifiConnect()
{
Serial.print("Connecting to ");
Serial.print("Wifi");
WiFi.begin("Wokwi-GUEST", "", 6);
while (WiFi.status() != WL_CONNECTED)
{
delay(500);
Serial.print(".");
}
Serial.print("WiFi connected, IP address: ");
Serial.println(WiFi.localIP());
}
void mqttConnect()
{
if (!client.connected())
{
Serial.print("Reconnecting MQTT client to ");
Serial.println(server); while
(!client.connect(clientId, authMethod, token))
{
Serial.print("."); delay(500);
}
initManagedDevice();
Serial.println();
}
}
void initManagedDevice()
{
if (client.subscribe(topic))
{
Serial.println("IBM subscribe to cmd OK");
}
}

```

```

    else
    {
        Serial.println("subscribe to cmd FAILED");
    }
}
void publishData()
{
    float cm = readcmCM();

    if(digitalRead(34)                                //PIR motion detection
    {
        Serial.println("Motion
        Detected");    Serial.println("Lid
        Opened"); digitalWrite(15, HIGH);
    }
    else
    {
        digitalWrite(15, LOW);
    }

    if(digitalRead(34)== true)
    {
        if(cm <= 100)                                //Bin level detection
        {
            digitalWrite(2, HIGH);
            Serial.println("High Alert!!!,Trash bin is about to be full");
            Serial.println("Lid Closed"); lcd.print("Full! Don't use");
            delay(2000);    lcd.clear();    digitalWrite(4,    LOW);
            digitalWrite(23, LOW);
        }
        else if(cm > 150 && cm < 250)
        {
            digitalWrite(4, HIGH);
            Serial.println("Warning!!,Trash is about to cross 50% of bin level"); digitalWrite(2,
            LOW);
            digitalWrite(23, LOW);
        }
        else if(cm > 250 && cm <=400)
        {
            digitalWrite(23,    HIGH);
            Serial.println("Bin    is
            available");
            digitalWrite(2,LOW);
            digitalWrite(4, LOW);
        }
        delay(10000); Serial.println("Lid Closed");
    }
    else
    {
        Serial.println("No motion detected");
    }

    if(cm <= 100)
    {
        digitalWrite(21,HIGH);
        String payload = "{\nHigh Alert!!\n":\n";
        payload += cm; payload
        += "left\n }";
        Serial.print("\n");
        Serial.print("Sending payload: ");
        Serial.println(payload);    if (client.publish(publishTopic, (char*) payload.c_str()))    // if data is uploaded to cloud
        successfully,prints publish ok or prints publish failed
        {

```

```

Serial.println("Publish OK");
}
}
if(cm <= 250)
{
digitalWrite(22,HIGH);
String payload = "{\"Warning!!\":\"\"";
payload += dist; payload += "left\" }";
Serial.print("\n");
Serial.print("Sending distance: "); Serial.println(cm);
if(client.publish(publishTopic, (char*) payload.c_str()))
{
Serial.println("Publish OK");
}
else
{
Serial.println("Publish FAILED");
}
}

float inches = (cm / 2.54);    //print on LCD lcd.setCursor(0,0); lcd.print("Inches");
lcd.setCursor(4,0); lcd.setCursor(12,0); lcd.print("cm"); lcd.setCursor(1,1); lcd.print(inches, 1);
lcd.setCursor(11,1); lcd.print(cm, 1); lcd.setCursor(14,1); delay(1000); lcd.clear();
}

```

### Connection Diagram

