

Delivery of Sprint-2

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PROJECT NAME	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[] = "use-token-auth"; // authentication method
char token[] = TOKEN;

char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;           //Client id

//.....-.

//.....
// creating instance for wiflient

WiFiClient 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");
}
}

```

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        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 = "{\"High Alert!!\":\"";
        payload += cm; payload
        += "left\"}";
        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

