

SPRINT -2

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TEAM ID	PNT2022TMID54350
PROJECT NAME	SMART WASTE MANAGEMENT FOR METROPOLITAN CITIES

Code for Data Transfer from Sensors

With a Truck Driver's view, one would be following the Admin's Instruction to reach the filling bin and save time, hence producing a cheaper mode of collection.

```
#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 "9gbe4w"                            // IBM organisation id
#define DEVICE_TYPE "SWMSMC"                    // Device type mentioned in ibm watson iot platform
#define DEVICE_ID "ibmproject"                  // Device ID mentioned in ibm watson iot platform
#define TOKEN "sUNA41tG6-Pq)0rk5X"             // Token

//.....customise above values.....- _____

char server[] = ORG ".messaging.internetofthings.ibmcloud.com"; //
server namechar 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
methodchar token[] = TOKEN;
char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID; //Client id

//.....

WiFiClient wifiClient;                          // creating instance for
wificlientPubSubClient 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("");
wifiConne
t();
mqttConne
t();
}

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();

publishDat
a();
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 = "{\ High
        Alert!!\":\";payload += cm;
        payload += "left\ }";
        Serial.print("\n");
        Serial.print("Sending
        payload: ");
        Serial.println(payload);
        if
        (client.publish(publishT
        opic, (char*)
        payload.c_str()))
            // if data is
            uploaded to cloud
            successfully,prints
            publish ok orprints
            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);
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();
}

```

//print on LCD

Connection Diagram

