TEAM ID	PNT2022TMID16132
PROJECT NAME	Smart Waste Management System for Metropolitan Cities

CODE FOR DATA TRANSFER FROM SENSORS

```
#include <WiFi.h>                  //Library for WiFi
#include <PubSubClient.h>          //Library for MQTT
#include <ArduinoJson.h>           //Library for ArduinoJson

WiFiClient wifiClient;

//-------------------------------Credentials on IBM Account-------------------------------------------------------------

#define ORG "k6spbs"                  //IBM Organisation ID
#define DEVICE_TYPE "MSD"             //Device mentioned in IBM Watson IOT Platform
#define DEVICE_ID "12345"             //Device ID mentioned on IBM Watson IOT Platform
#define TOKEN "123456789"             //Token
#define speed 0.034

//-------------------------------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/home/fmt/String";
char authMethod[] = "use-token-auth";                                     //Authentication Method
```

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

//-------------------------------------------------------------------------------------------------------------------------------

PubSubClient client(server, 1883, wifiClient);
void publishData();

const int trigpin=5;
const int echopin=18;
String command;
String data="";
String lat="13.167558";
String lon="80.244510";
String name="point2";
String icon="fa-trash-o";
String color="green";
long duration;
int dist;

void setup()
{
 Serial.begin(115200);
 pinMode(trigpin, OUTPUT);
 pinMode(echopin, INPUT);
 wifiConnect();
 mqttConnect();
}

void loop() {
```

```
  publishData();
  delay(500);

  if (!client.loop()) {
    mqttConnect();
  }
}

//-----------------------------------------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(1000);
    }
    initManagedDevice();
    Serial.println();
  }
```

```
}

void initManagedDevice() {
  if (client.subscribe(topic)) {
     Serial.println(client.subscribe(topic));
    Serial.println("subscribe to cmd OK");
  } else {
    Serial.println("subscribe to cmd FAILED");
  }
}

//-------------------------------------------------------Publish Smart Bin level-----------------------------------------



void publishData()
{
  digitalWrite(trigpin,LOW);
  digitalWrite(trigpin,HIGH);
  delayMicroseconds(10);
  digitalWrite(trigpin,LOW);
  duration=pulseIn(echopin,HIGH);
  dist=duration*speed/2;
  dist=dist/4;
  dist=100-dist;
  if(dist>80){
    icon="fa-trash";
    color="red";
  }else{
    icon="fa-trash-o";
    color="green";
  }
```

```
 DynamicJsonDocument doc(1024);
 String payload;
 doc["Name"]=name;
 doc["Latitude"]=lat;
 doc["Longitude"]=lon;
 doc["Icon"]=icon;
 doc["FillPercent"]=dist;
 doc["Color"]=color;
 serializeJson(doc, payload);
 delay(3000);

//-----------------------------------------Print on LCD-----------------------------------------------------------------------


 Serial.print("\n");
 Serial.print("Sending payload: ");
 Serial.println(payload);
 if (client.publish(publishTopic, (char*) payload.c_str())) {
  Serial.println("Publish OK");
 } else {
  Serial.println("Publish FAILED");
 }
}


//-------------------------------------------------End of Program-----------------------------------------------------
```

CIRCUIT CONFIGURATION: