DELIVERY OF SPRINT 2

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Team ID	PNT2022TMID43225
Project Name	Smart waste management system for metropolitan cities

Data transfer from Sensor to IOT Cloud

WOKWI Code:

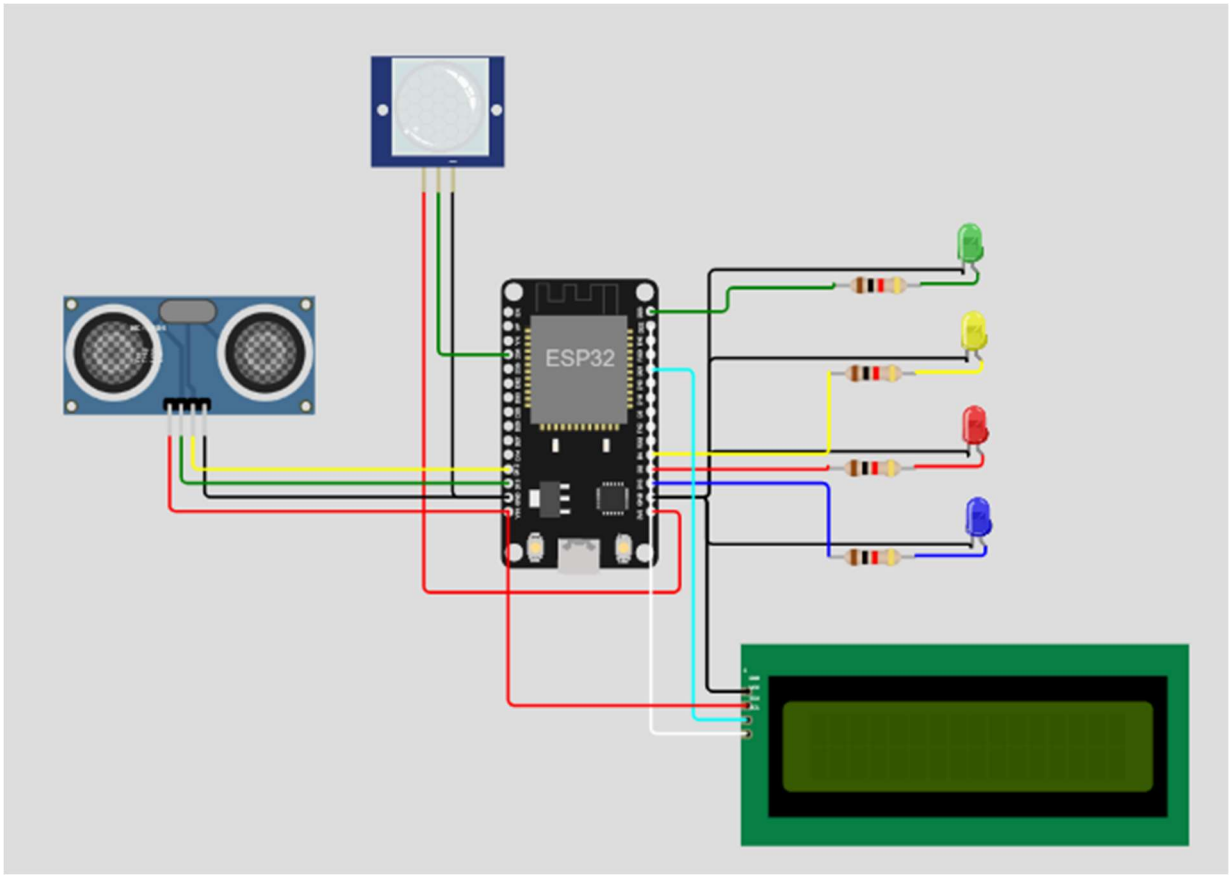
```
#include <WiFi.h>
#include <PubSubClient.h>
#include <LiquidCrystal_I2C.h>
LiquidCrystal_I2C lcd(0x27, 20, 4);

#define ORG "73ffyv"
#define DEVICE_TYPE "Ultra-dist"
#define DEVICE_ID "distme"
#define TOKEN "123456789"

char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
char publishTopic[] = "iot-2/evt/data/fmt/json";
char topic[] = "iot-2/cmd/led/fmt/String";
char authMethod[] = "use-token-auth";
char token[] = TOKEN;
char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;

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);
  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(); }
}

/* -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)){
    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())){
      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();
}
```

Circuit Diagram:


ESP32