DELIVERY OF SPRINT 2

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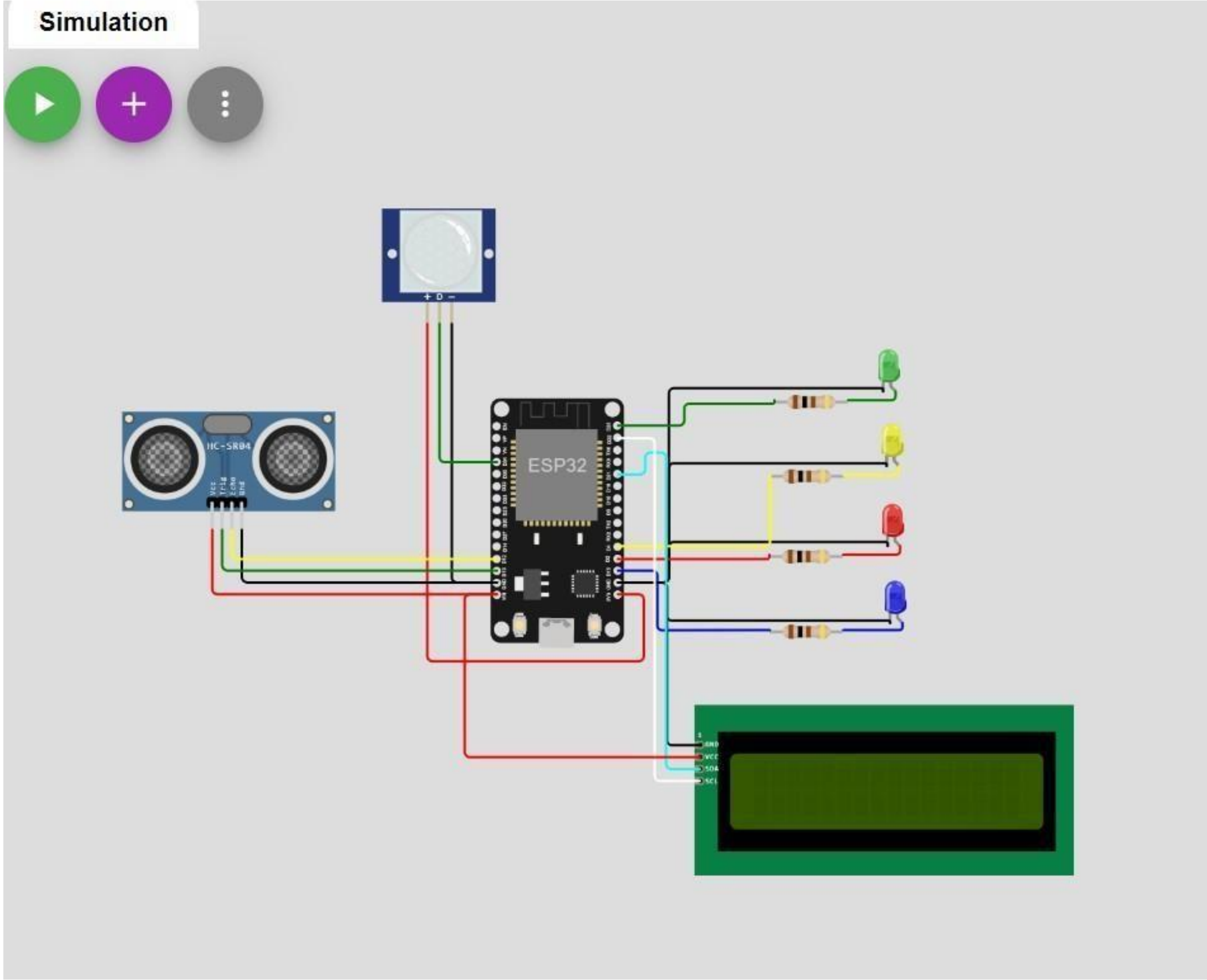
PROJECT NAME	SMART WASTE MANAGEMENT FOR METROPOLITAN CITIES-IOT

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 "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 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

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

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.p
rintln("s
ubscrib
e 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


Simulation
HC-SR04
Vcc
Trig
Echo
Gnd
+ D −
ESP32
GND
VCC
SDA
SCL