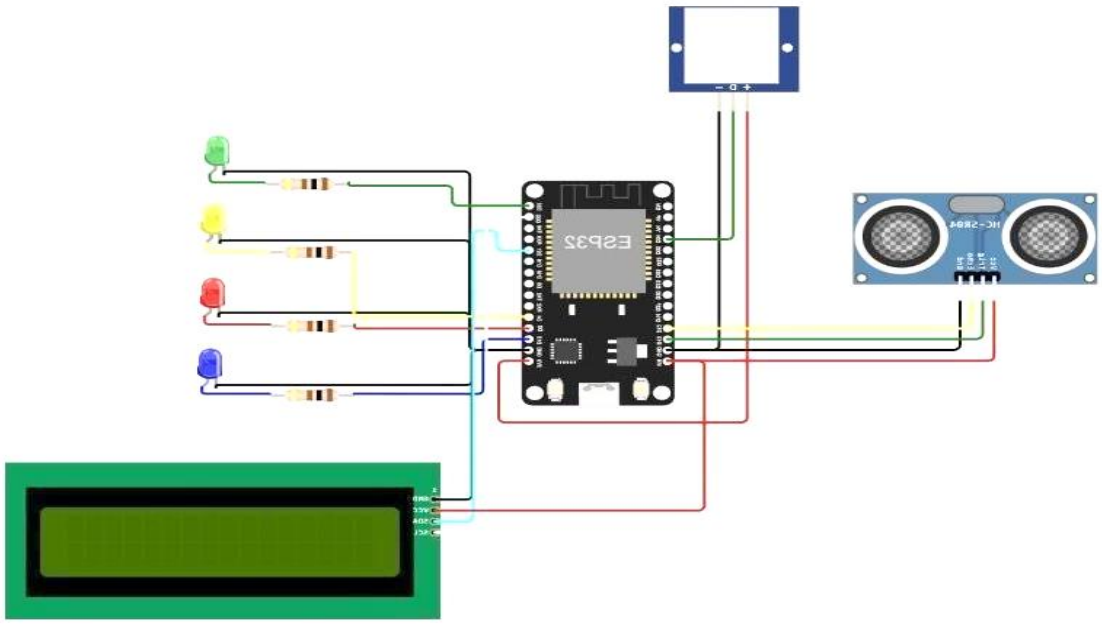
SPRINT DELIVERY - II

TEAM ID	PNT2022TMID07372
PROJECT NAME	SMART WASTE MANAGEMENT SYSTEMFOR METROPOLITAN CITIES

SIMULATING MODEL DIAGRAM:



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);

#define ORG "IOTproject01"                  // IBM organisation id
#define DEVICE_TYPE                  // Device type mentioned in ibm watson iot
"TestTypeDevice"                                                    platform
#define DEVICE_ID "369"              // Device ID mentioned in ibm watson iot
                                                                    platform
#define TOKEN "devi@IFS7"                   // Token



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[] = "usetoken- 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.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();
}
```