Delivery of Sprint-2

DATE	16 November 2022
TEAM ID	PNT2022TMID34757
PROJECT NAME	SMART WASTE MANAGEMENT FOR METROPOLITAN CITIES

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 "ktymlx"                          // IBM organisation id
#define DEVICE_TYPE "new"           // Device type mentioned in ibm watson
                                                                iot platform
#define DEVICE_ID "09876"         // Device ID mentioned in ibm watson iot
                                                                  platform
#define TOKEN "Kamesh@2002"              // 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[] = "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;
    }
```

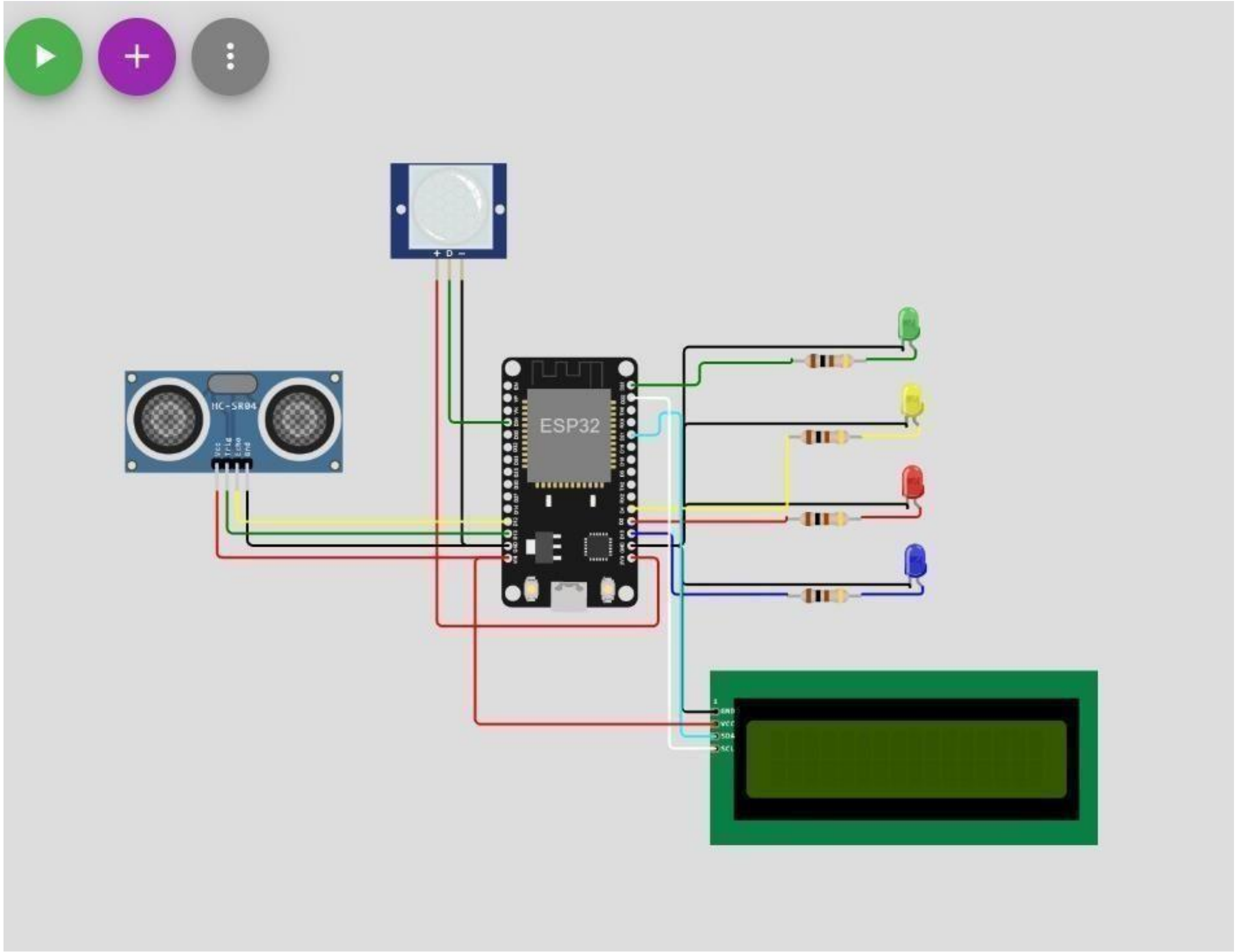
```
void loop()
{

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();
    }
```

Connection Diagram


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