Delivery of Sprint-2

DATE	16 November 2022
TEAM ID	PNT2022TMID42931
PROJECT NAME	SMART WASTE MANAGEMENT FOR METROPOLITAN CITIES

Code for Data Transfer from Sensors

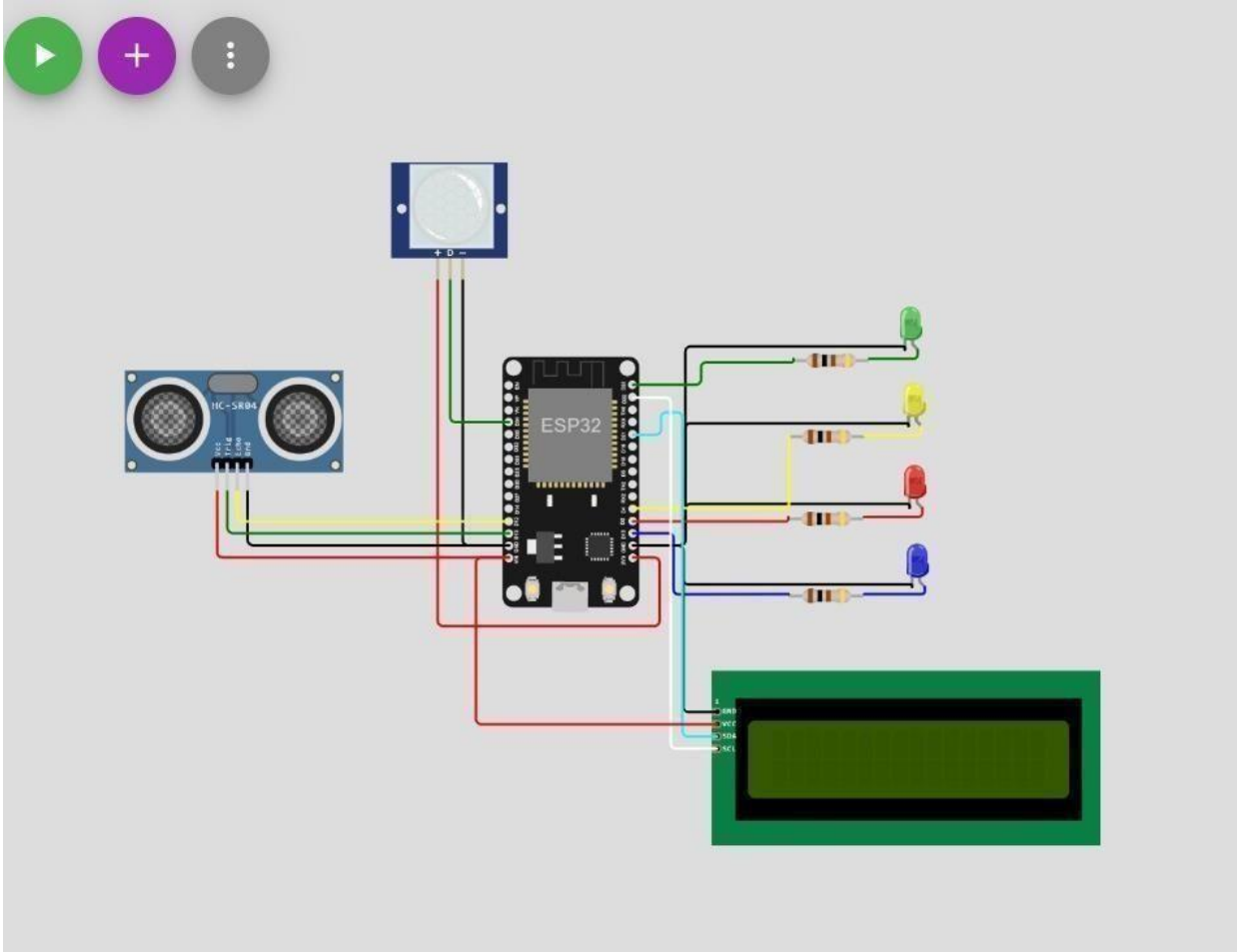
```
#include <WiFi.h>                                   // library for wifi
#include <PubSubClient.h>                           // library for MQTT
#include <LiquidCrystal_I2C.h> LiquidCrystal_I2C
lcd(0x27, 20, 4);

//                  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


HC-SR04
ESP32