SPRINT -2

DATE	08 November 2022
TEAM ID	PNT2022TMI46042
PROJECT NAME	SMART WASTE MANAGEMENT FOR METROPOLITAN CITIES

Code for Data Transfer from Sensors

With a Truck Driver's view, one would be following the Admin's Instruction to reach the filling bin and save time, hence producing a cheaper mode of collection.

```
#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          // Device type mentioned in ibm
"SWMSMC"                         watson iot platform
#define DEVICE_ID              // Device ID mentioned in ibm
"ibmproject"                     watson iot platform
#define TOKEN                  // Token
"sUNA41tG6-Pq)0rk5X"
// customise above -____ values

char server[] = ORG
```

```
".messaging.internetofthings.ibmcloud.com"; // server
namechar 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
wificlientPubSubClient client(server, 1883, wifiClient);

#define
ECHO_PIN
12#define
TRIG_PIN
13
float dist;

void setup()
```

```
Serial.begin(115200);
pinMode(LED_BUIL
TIN, OUTPUT);
pinMode(TRIG_PIN,
OUTPUT);
pinMode(ECHO_PIN
,
    INPUT); //pir pin
    pinMode(4, INPUT);

    //ledpins
    pinMode(23,
    OUTPUT);
    pinMode(2,
    OUTPUT);
    pinMode(4,
    OUTPUT); pinMod
    e(15,
    OUTP
    UT);

    lcd.init();
    lcd.backl
    ight();
    lcd.setCu
    rsor(1 ,
    0);
    lcd.print(
    "");
    wifiConn
    ec t();
    mqttCon
```

```
nec t();
}

float readcmCM()
{
digitalWrite(TRIG
_PIN,
LOW);delayMicro
seconds(2);
digitalWrite(TRIG
_PIN, HIGH); delayMicroseconds(10)
;
digitalWrite(TRI
G_PIN, LOW);
int duration =
pulseIn(ECHO_P
IN,HIGH); return
duration * 0.034 /
2; } void
loop()
{

lcd.clear(
);
publishD
at a();
delay(50
0); if (!client.l
oop())
  {
   mqttConnect();                         // function call to connect to IBM
  }
}

/* ............................................................-retrieving to cloud ...............................*/

void wifiConnect()
```

```
{
Serial.print("Connecting to ");
Serial.print("Wifi");
```

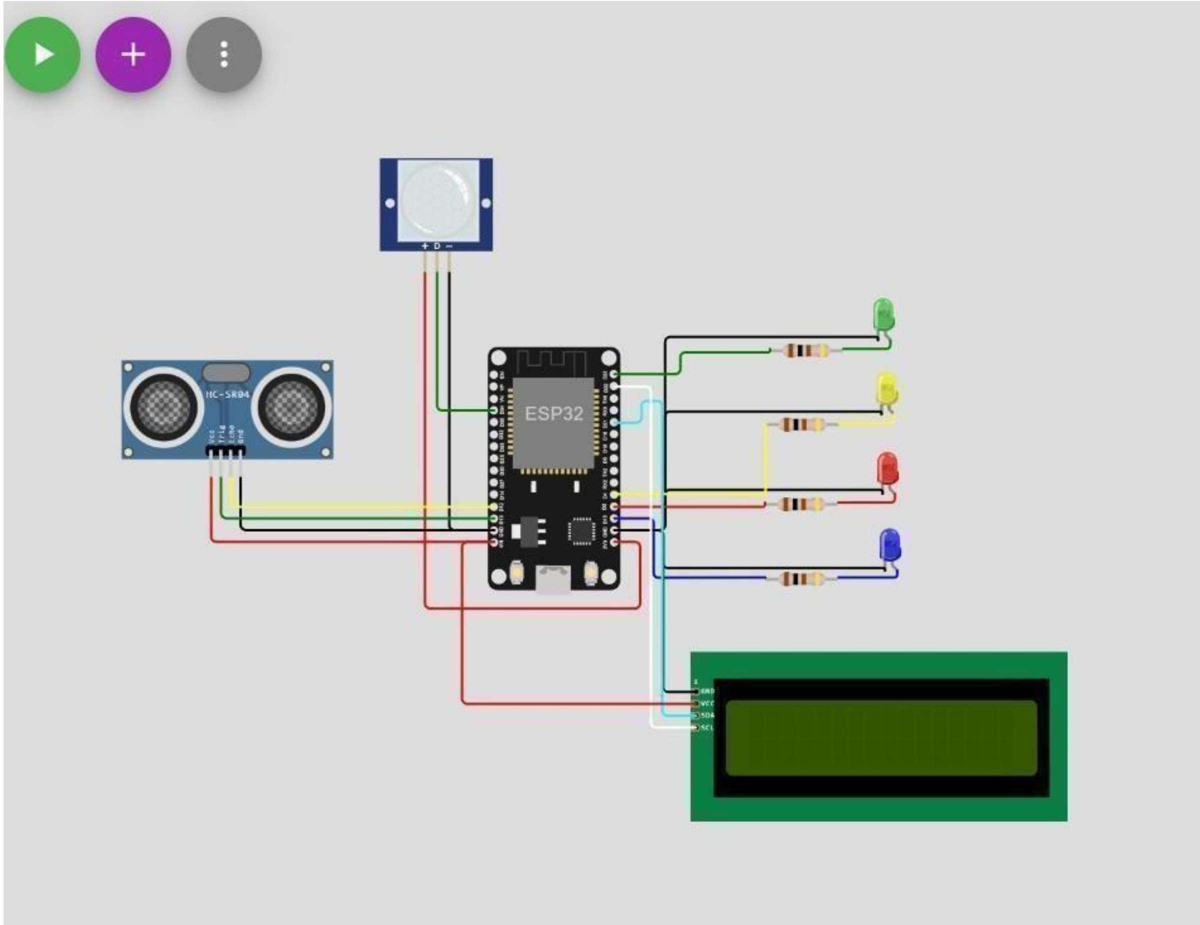
```
WiFi.begin("Wokwi- GUEST","", 6); while
  (WiFi.status() != WL_CONNECTED)
   { delay(500);
    Serial.print(".");
   }
  Serial.print("WiFi connected, IP address: ");
  Serial.println(WiFi.localIP());
  }
  void mqttConnect()
  { if
   (!client.connected())
    {
    Serial.print("Reconnecting
    MQTT      client      to      ");
    Serial.println(server);
                                  wh
    ile      (!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.print
  ln("Lid
  Closed");
  lcd.print("F
  ull! Don't
  use");delay
  (2000);
  lcd.clear();
  digitalWrit
  e(4, LOW);
 digitalWr
 ite(23,
 LOW);
}
else if(cm > 150 && cm < 250)
{ digitalWrite(4, HIGH);
 Serial.println("Warning!!,Tra
 sh is about to cross 50%of bin
 level");digitalWrite(2, LOW);
 digitalWrite(23,LOW);
}
else if(cm > 250 && cm <=400)
{
 digitalWr
 ite(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,H
IGH);
Stringpayload =
"{\"High
```

```
Alert!!\":\"";payl
oad += cm;
payload +=
"left\" }";
Serial.print("\n")
;
Serial.print("Sen
ding payload: ");
Serial.println(pa
yload);
if
(client.publis
h(publish    T
opic,   (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,HI
GH); Stringpayload
=
"{\"Warning!!\":\""
;payload
+= dist; payload
+="left\" }";
Serial.print("
\n");
```

```
Serial.print("
Sending
distance: ");
Serial.printl
n(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("In
che s");
lcd.setCurs
or(4
,0);
lcd.setCursor(12
,0); lcd.print("c
m");
lcd.setCurs
or(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
+ D −
GND
VCC
SDA
SCL