SPRINT -2

DATE	**08 November 2022**
TEAM ID	**PNT2022TMI46602**
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("Co
nnecting 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)
{
```

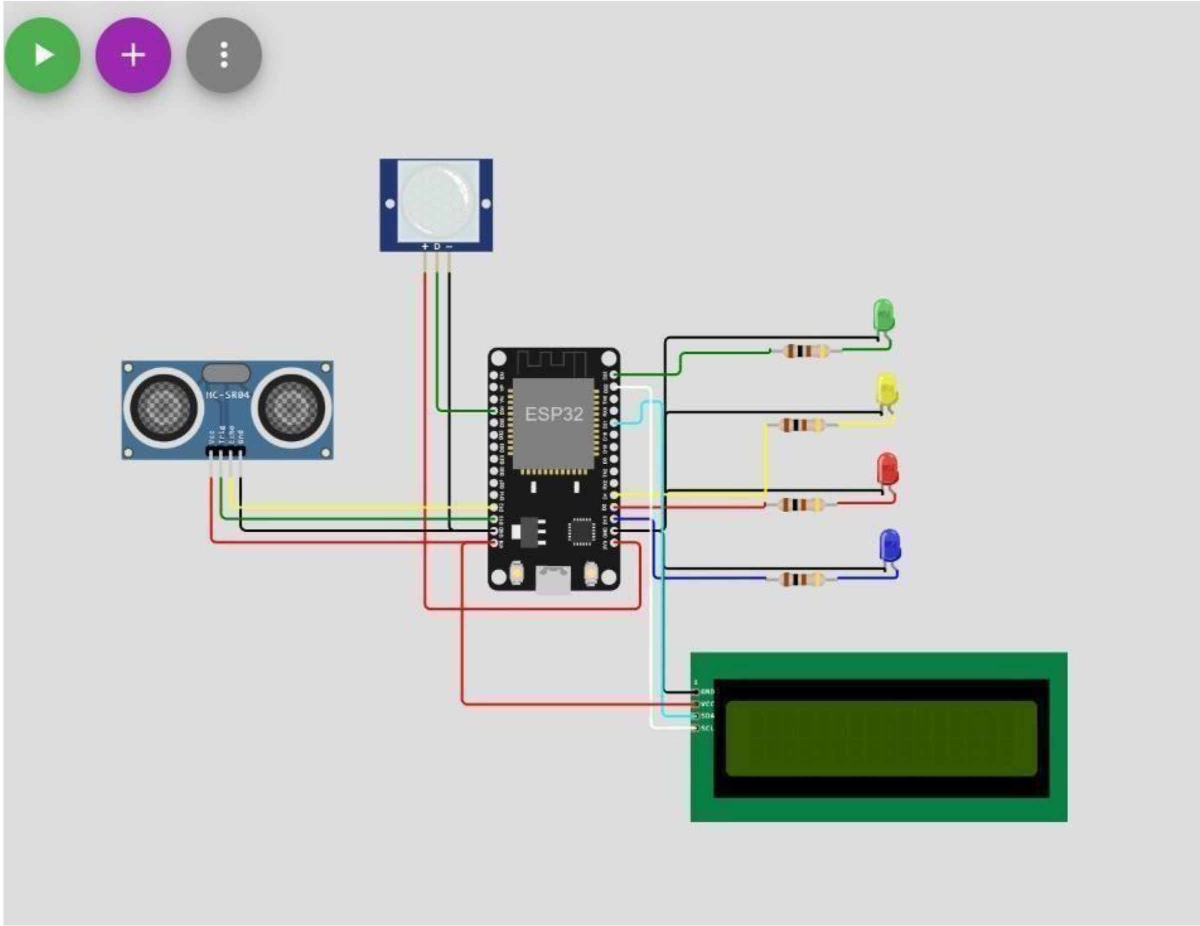
```
digitalWrite(21,H
IGH);
Stringpayload =
"{\"High
Alert!!\":\"";payl
oad += cm;
payload +=
"left\" }";
Serial.print("\n")
;
Serial.print("Sen
ding payload: ");
Serial.println(pa
yload);
if
(client.publis
h(publishT
opic, (char*)
payload.c_str
()))
      // if data
is uploaded
to cloud
successfully
,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
ches");
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



+ D −
HC-SR04
Vcc
Trig
Echo
Gnd
ESP32
1
GND
VCC
SDA
SCL