SPRINT -2

DATE	**08November 2022**
TEAM ID	**PNT2022TMID47912**
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.

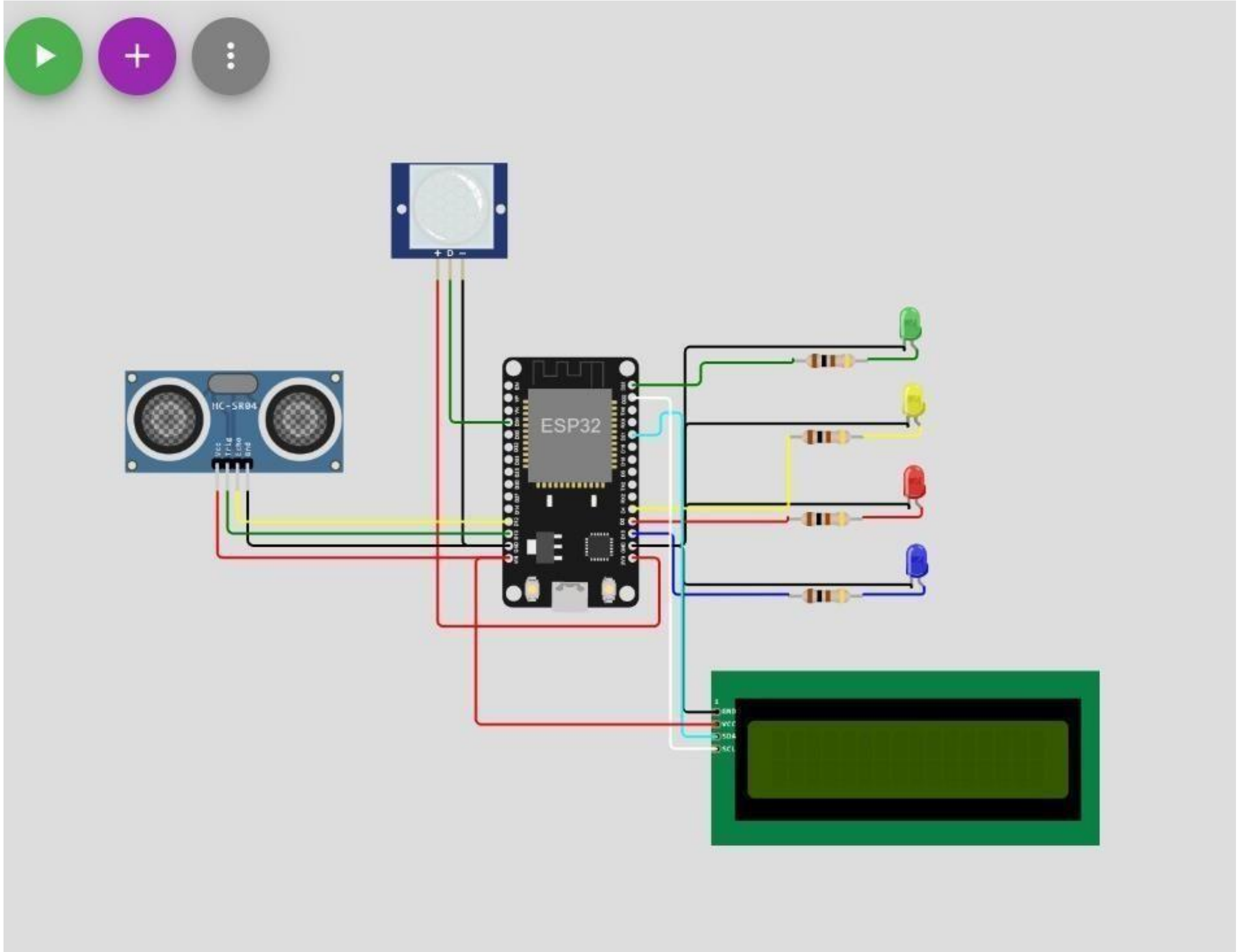
```
#include <WiFi.h>                                  // library for wifi
#include <PubSubClient.h>                          // library for
MQTT#include <LiquidCrystal_I2C.h>
LiquidCrystal_I2C lcd(0x27, 20, 4);

//____________credentials of IBM Accounts ....................-

#define ORG "9gbe4w"                               // IBM organisation id
#define DEVICE_TYPE "SWMSMC"                       // Device type mentioned in ibm watson iot platform
#define DEVICE_ID "ibmproject"                     // Device ID mentioned in ibm watson iot platform
#define TOKEN "sUNA41tG6-Pq)0rk5X"                 // Token

//____________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 methodchar 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_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("");
wifiConnec t();
mqttConnec
t();
}


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();

publishDat a();
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(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,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("Inche
s"); 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
Vcc
Trig
Echo
Gnd
+ D −
ESP32
GND
VCC
SDA
SCL