SPRINT-2

Date	14 November 2022
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Project Name	Smart Waste Management System 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 "9v7njv"                    // IBM organisation id
#define DEVICE_TYPE "123"               // Device type mentioned in ibm watson iot platform
#define DEVICE_ID "1234567"             // Device ID mentioned in ibm watson iot platform
#define TOKEN "12345678"                // 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[] = "use-token-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.backligh
 t();
 lcd.setCurso
 r(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;
}
```

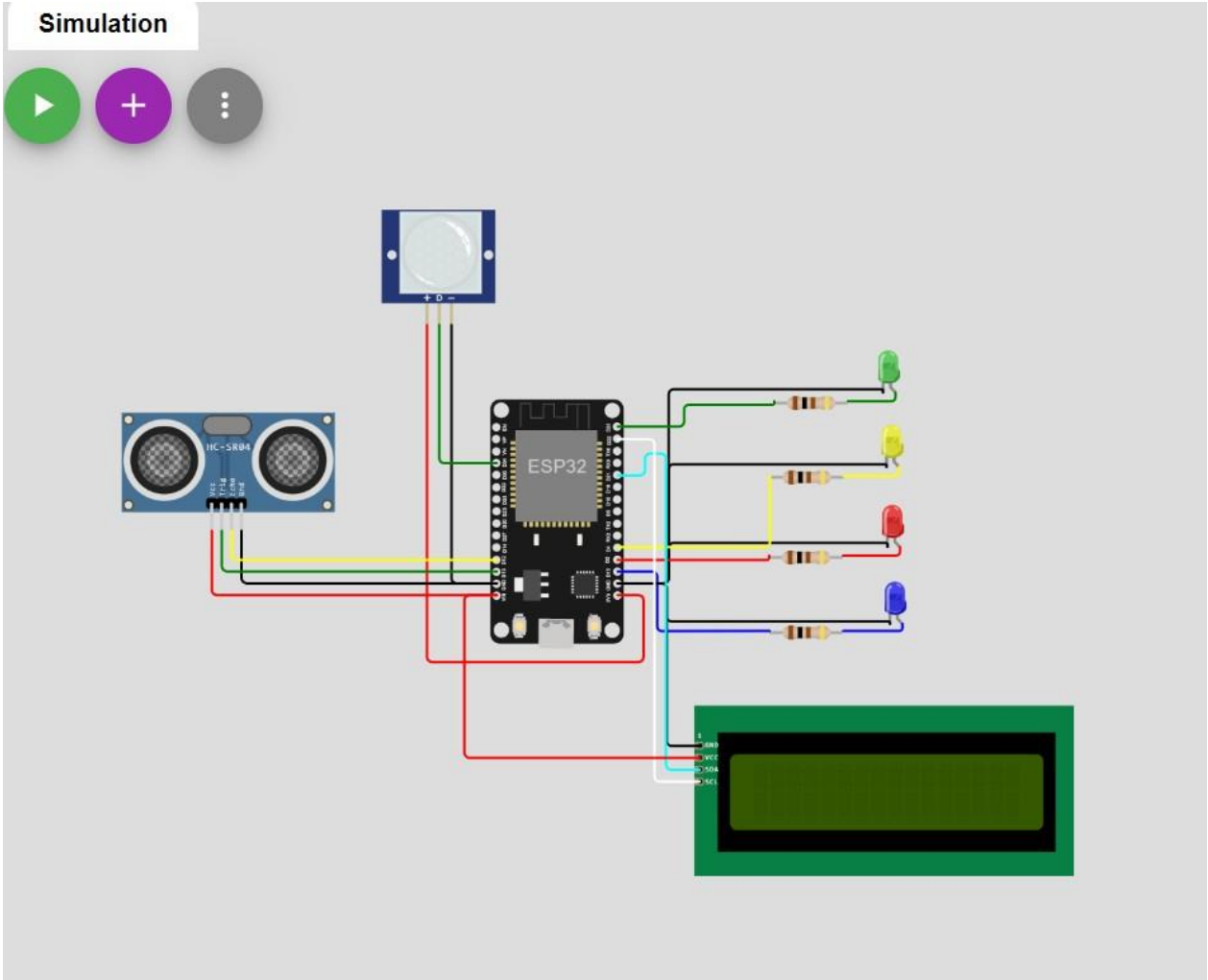
```
void loop()
{

 lcd.clear();

 publishD
 ata();
 delay(50
 0);
 if (!client.loop())
  {
   mqttConnect();                                    // function call to connect to IBM
  }
}

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

void wifiConnect()
{
 Serial.print("Connecti
 ng 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.prin
      t(".");
      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("Li
  d            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(payloa
d);



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("Inc
 hes");
 lcd.setCursor
 (4,0);
 lcd.setCursor(
 12,0);
 lcd.print("cm
 ");
 lcd.setCursor
 (1,1);
 lcd.print(inch
 es, 1);
 lcd.setCursor(
 11,1);
 lcd.print(cm,
 1);
 lcd.setCursor(
 14,1);
 delay(1000);
 lcd.clear();
}
```

Connection Diagram



Link : https://wokwi.com/projects/347376419979919956