PROJECT DEVELOPEMENT PHASE

DELIVERY OF SPRINT – 2

Date	03November 2022
Team ID	PNT2022TMID43114
Project Name	Smart Waste Management System For Metropolitan Cities

CODE :

```
#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 "80bbqy"                 // IBM organisation id
#define DEVICE_TYPE "cse2019"        // Device type mentioned in ibm watson iot platform
#define DEVICE_ID "ganesh1601"       // 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";                  // topic name and type of event perform and format in
which data to be send
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(34, 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 ");
```

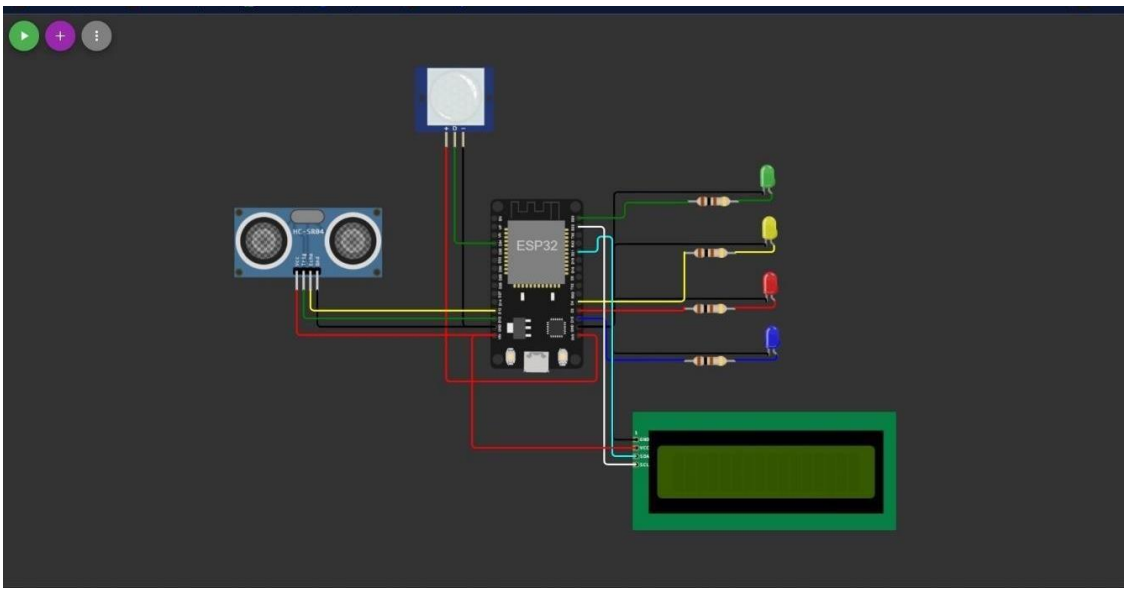
```
 Serial.print("Wifi");
 WiFi.begin("Wokwi-GUEST", "", 6);
 while (WiFi.status() != WL_CONNECTED)
  {
    delay(500);
    Serial.print(".");
  }
 Serial.print("WiFi connected, IP address: ");
 Serial.println(WiFi.localIP());
}
void mqttConnect()
 {
  if (!client.connected())
    {
      Serial.print("Reconnecting 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);
 if(digitalRead(34)== true)
{
 if(cm <= 60)                          //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 > 60 && cm < 120)
 {
  digitalWrite(4, HIGH);
  Serial.println("Warning!!,Trash is about to cross 50% of bin level");
  digitalWrite(2, LOW);
  digitalWrite(23, LOW);

 }
 else if(cm > 120)
 {
  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");
   digitalWrite(2, LOW);
   digitalWrite(15, LOW);
   digitalWrite(4, LOW);
   digitalWrite(23, LOW);
}
 }
 else
 {
   digitalWrite(15, LOW);
   }
if(cm <= 60)
{
digitalWrite(21,HIGH);
String payload = "{\"High_Alert\":";
payload += cm;
payload += " }";
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
else prints publish failed
{
Serial.println("Publish OK");
}
}
else if(cm <= 120)
{
digitalWrite(22,HIGH);
String payload = "{\"Warning\":";
payload += cm ;
payload += " }";
Serial.print("\n");
```

```
Serial.print("Sending payload: ");
Serial.println(payload);
if(client.publish(publishTopic, (char*) payload.c_str()))
{
Serial.println("Publish OK");
}
else
{
Serial.println("Publish FAILED");
}
}
else
{
Serial.println();
}
 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();
}
```

CIRCUIT :



esp32-blink.ino | diagram.json | libraries.txt | Library Manager

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

//---------------------- credentials of IBM Accounts ----------------------------

#define ORG "cbseji"                          // IBM organisation id
#define DEVICE_TYPE "abcd"                  // Device type mentioned in ibm watson iot p
#define DEVICE_ID "1234"                 // Device ID mentioned in ibm watson iot platfor
#define TOKEN "12345678"          // Token

//---------------------- customise above values ---------------------------------

char server[] = ORG ".messaging.internetofthings.ibmcloud.com";                // serve
char publishTopic[] = "iot-2/evt/data/fmt/json";                               // topic
char topic[] = "iot-2/cmd/led/fmt/String";                                     // cmd f
char authMethod[] = "use-token-auth";                                          // authe
char token[] = TOKEN;
char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;                     //Client

//-------------------------------------------------------------------------------

WiFiClient wifiClient;                                                        // creatin
PubSubClient client(server, 1883, wifiClient);

#define ECHO_PIN 12
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float dist;

void setup()
{
  Serial.begin(115200);
  pinMode(LED_BUILTIN, OUTPUT);
  pinMode(TRIG_PIN, OUTPUT);
  pinMode(ECHO_PIN, INPUT);
```

Simulation