Sprint-2

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PROJECT NAME	SMART WASTE MANAGEMENT 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 "s1e201"                                // IBM organisation id
#define DEVICE_TYPE "lavi123"                       // Device type mentioned in ibm watson iot platform
#define DEVICE_ID "12345"                           // Device ID mentioned in ibm watson iot platform
#define TOKEN "23456789"                            // 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[] = "usetoken-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.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);
}
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(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("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();
}
```

Connection Diagram