

TEAM ID	PNT2022TMI04391
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PROJECT NAME	Smart Waste Management for Metropolitan Cities
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FINAL 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 "3defa" //IBM organisation id
#define DEVICE_TYPE "hariprasath" // Device type mentioned in ibm watson iot platform
#define DEVICE_ID "12345" // Device ID mentioned in ibm watson iot platform
#define TOKEN "CpL-H1C-Pt4i9iM-F5" // 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
  pinMode(4, INPUT);
  //ledpins
  pinMode(23,OUTPUT);
  pinMode(2,OUTPUT); pinMode(4,OUTPUT);
  pinMode(15,OUTPUT); lcd.init();
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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))

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{
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
l.prin
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on
detec
ted");
}
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();
}

```

