



**INFORMATICS INSTITUTE OF TECHNOLOGY**

**(DEPARTMENT OF COMPUTING)**

**AIR POLLUTION MONITORING SYSTEM**

Module : **5COSC009C Software Development Group Project**

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**Code**

include "MQ135.h"

#include <SoftwareSerial.h>

#**define** DEBUG **true**

SoftwareSerial esp8266(9,10); // This makes pin 9 of Arduino as RX pin and pin 10 of Arduino as the TX pin

**const** **int** sensorPin= 0;

**int** air\_quality;

#include <LiquidCrystal.h>

LiquidCrystal lcd(12,11, 5, 4, 3, 2);

**void** **setup**() {

pinMode(8, OUTPUT);

lcd.begin(16,2);

lcd.setCursor (0,0);

lcd.print ("circuitdigest ");

lcd.setCursor (0,1);

lcd.print ("Sensor Warming ");

delay(1000);

Serial.begin(115200);

esp8266.begin(115200); // your esp's baud rate might be different

sendData("AT+RST\r\n",2000,DEBUG); // reset module

sendData("AT+CWMODE=2\r\n",1000,DEBUG); // configure as access point

sendData("AT+CIFSR\r\n",1000,DEBUG); // get ip address

sendData("AT+CIPMUair\_quality=1\r\n",1000,DEBUG); // configure for multiple connections

sendData("AT+CIPSERVER=1,80\r\n",1000,DEBUG); // turn on server on port 80

pinMode(sensorPin, INPUT); //Gas sensor will be an input to the arduino

lcd.clear();

}

**void** loop() {

MQ135 gasSensor = MQ135(A0);

**float** air\_quality = gasSensor.getPPM();

**if**(esp8266.available()) // check if the esp is sending a message

{

**if**(esp8266.find("+IPD,"))

{

delay(1000);

**int** connectionId = esp8266.read()-48; /\* We are subtracting 48 from the output because the read() function returns the ASCII decimal value and the first decimal number which is 0 starts at 48\*/

String webpage = "<h1>IOT Air Pollution Monitoring System</h1>";

webpage += "<p><h2>";

webpage+= " Air Quality is ";

webpage+= air\_quality;

webpage+=" PPM";

webpage += "<p>";

**if** (air\_quality<=1000)

{

webpage+= "Fresh Air";

}

**else** **if**(air\_quality<=2000 && air\_quality>=1000)

{

webpage+= "Poor Air";

}

**else** **if** (air\_quality>=2000 )

{

webpage+= "Danger! Move to Fresh Air";

}

webpage += "</h2></p></body>";

String cipSend = "AT+CIPSEND=";

cipSend += connectionId;

cipSend += ",";

cipSend +=webpage.length();

cipSend +="\r\n";

sendData(cipSend,1000,DEBUG);

sendData(webpage,1000,DEBUG);

cipSend = "AT+CIPSEND=";

cipSend += connectionId;

cipSend += ",";

cipSend +=webpage.length();

cipSend +="\r\n";

String closeCommand = "AT+CIPCLOSE=";

closeCommand+=connectionId; // append connection id

closeCommand+="\r\n";

sendData(closeCommand,3000,DEBUG);

}

}

lcd.setCursor (0, 0);

lcd.print ("Air Quality is ");

lcd.print (air\_quality);

lcd.print (" PPM ");

lcd.setCursor (0,1);

**if** (air\_quality<=1000)

{

lcd.print("Fresh Air");

digitalWrite(8, LOW);

}

**else** **if**( air\_quality>=1000 && air\_quality<=2000 )

{

lcd.print("Poor Air, Open Windows");

digitalWrite(8, HIGH );

}

**else** **if** (air\_quality>=2000 )

{

lcd.print("Danger! Move to Fresh Air");

digitalWrite(8, HIGH); // turn the LED on

}

lcd.scrollDisplayLeft();

delay(1000);

}

String sendData(String command, **const** **int** timeout, **boolean** debug)

{

String response = "";

esp8266.print(command); // send the read character to the esp8266

**long** **int** time = millis();

**while**( (time+timeout) > millis())

{

**while**(esp8266.available())

{

// The esp has data so display its output to the serial window

**char** c = esp8266.read(); // read the next character.

response+=c;

}

}

**if**(debug)

{

Serial.print(response);

}

**return** response;

}