

## ASSIGNMENT 2

DATE	24 MAY 2023
TEAM ID	NM2023TMID11390
PROJECT TITLE	IOT based weather adaptive street lighting system

Build Python code, Generate Temperature and Humidity values (Use Random function to generate values) and write a condition to detect an alarm in case of high temperature and high Humidity.

Code:

```
/* How to use the DHT-22 sensor with Arduino uno.
   Is a temperature and humidity sensor!
   See it in original form:
   https://create.arduino.cc/projecthub/mafzal/temperature-monitoring-with-dht22-arduino-15b013
*/
//LCD I2C library:
#include <LiquidCrystal_I2C.h>
//DHT22 sensor library:
#include <DHT.h>;
//LCD I2C address 0x27, 16 column and 2 rows!
LiquidCrystal_I2C lcd(0x27, 16, 2);

//Constants:
#define DHTPIN 2           //what pin we're connected to
#define DHTTYPE DHT22      //DHT 22 (AM2302)
DHT dht(DHTPIN, DHTTYPE); //Initialize DHT sensor for normal 16mhz Arduino
//Variables:
int chk;
float H; //Humidity value
float T; //Temperature value
int buzzer = 12;

//Initialize LCD, DHT22 sensor and buzzer:
void setup(){
  lcd.init(); lcd.backlight(); dht.begin(); pinMode(buzzer, OUTPUT);
  //Print some text in Serial Monitor
  Serial.begin(9600); Serial.println("DHT22 sensor with Arduino Uno R3!");
  pinMode(9, OUTPUT); pinMode(10, OUTPUT); pinMode(11, OUTPUT);
}

void loop(){
  delay(2000);
```

```

//Read data and store it to variables hum and temp
H = dht.readHumidity(); T = dht.readTemperature();

//Print temp and humidity values to serial monitor
Serial.print("Humidity: ");
Serial.print(H);
Serial.println(" %; ");
Serial.print("Temperature: ");
Serial.print(T);
Serial.println(" Celsius.\n");

/*If humidity is higher than 70% &
temperature is higher than 30 degrees Celsius
then it will show on LCD „Too warm! Cool down!“*/
if(H >= 70.00 && T >= 30.00){
    digitalWrite(9, HIGH); digitalWrite(10, LOW); digitalWrite(11, LOW);

    lcd.println("    Too warm!    ");
    lcd.setCursor(0, 1);
    lcd.println("    Cool down!    ");
    lcd.setCursor(0, 0);

    digitalWrite(buzzer, 1); tone(buzzer, 900, 100);
    delay(400);
    digitalWrite(buzzer, 0); tone(buzzer, 900, 100);
    delay(400);
    digitalWrite(buzzer, 1); tone(buzzer, 900, 100);
    delay(400);
    digitalWrite(buzzer, 0); tone(buzzer, 900, 100);
    delay(400);
}else{
    /*If humidity is lower than 70% &
    temperature is lower than 30 degrees Celsius
    then it will show on LCD „Temp. & hum. are in normal limits“*/
    digitalWrite(9, LOW); digitalWrite(10, LOW); digitalWrite(11, HIGH);
    lcd.println("Temp. & hum. are"); lcd.setCursor(0, 1);
    lcd.println("in normal limits"); lcd.setCursor(0, 0);
    digitalWrite(buzzer, 0);
}

/*If either humidity is lower than 70%, but
temperature is higher than 30 degrees Celsius,
then it will show on LCD „Be ware! Temp. too high” or
humidity is higher than 70%, but
temperature is lower than 30 degrees Celsius, then
it will show on LCD „Be ware! Hum. too high“*/
if(H < 70.00 && T >= 30.00){
    digitalWrite(9, LOW); digitalWrite(10, HIGH); digitalWrite(11, LOW);
    lcd.println("Be ware!    "); lcd.setCursor(0, 1);
    lcd.println("Temp. too high! "); lcd.setCursor(0, 0);
    digitalWrite(buzzer, 1); tone(buzzer, 400, 400); delay(400);
    digitalWrite(buzzer, 0); tone(buzzer, 400, 400); delay(400);
}
if(H >= 70.00 && T < 30.00){

```

```

    digitalWrite(9, LOW); digitalWrite(10, HIGH); digitalWrite(11, LOW);
    lcd.println("Be ware! "); lcd.setCursor(0, 1);
    lcd.println("Hum. too high! "); lcd.setCursor(0, 0);
    digitalWrite(buzzer, 1); tone(buzzer, 400, 400); delay(400);
    digitalWrite(buzzer, 0); tone(buzzer, 400, 400); delay(400);
  }
}

```

## Diagram .json

```

{
  "version": 1,
  "author": "Barbu Vulc",
  "editor": "wokwi",
  "parts": [
    { "type": "wokwi-breadboard-half", "id": "bb1", "top": -223.8, "left": -26, "attrs": {} },
    { "type": "wokwi-arduino-uno", "id": "uno", "top": -6.15, "left": 0, "attrs": {} },
    {
      "type": "wokwi-dht22",
      "id": "dht1",
      "top": -258.9,
      "left": 196.2,
      "attrs": { "temperature": "-25.1", "humidity": "9.5" }
    },
    {
      "type": "wokwi-led",
      "id": "led1",
      "top": -214.8,
      "left": -5.8,
      "attrs": { "color": "green" }
    },
    {
      "type": "wokwi-resistor",
      "id": "r1",
      "top": -120,
      "left": -10.15,
      "rotate": 90,
      "attrs": { "value": "220" }
    },
    {
      "type": "wokwi-resistor",
      "id": "r2",
      "top": -110.4,

```

```

    "left": 181.85,
    "rotate": 90,
    "attrs": { "value": "330" }
  },
  {
    "type": "wokwi-buzzer",
    "id": "bz1",
    "top": -170.4,
    "left": 97.8,
    "attrs": { "volume": "1" }
  },
  {
    "type": "wokwi-lcd1602",
    "id": "lcd1",
    "top": 177.96,
    "left": 284.58,
    "attrs": { "pins": "i2c", "background": "blue", "color": "yellow" }
  },
  {
    "type": "wokwi-led",
    "id": "led2",
    "top": -214.8,
    "left": 23,
    "attrs": { "color": "yellow" }
  },
  {
    "type": "wokwi-led",
    "id": "led3",
    "top": -214.8,
    "left": 51.8,
    "attrs": { "color": "red" }
  },
  {
    "type": "wokwi-resistor",
    "id": "r3",
    "top": -120,
    "left": 18.65,
    "rotate": 90,
    "attrs": { "value": "220" }
  },
  {
    "type": "wokwi-resistor",
    "id": "r4",
    "top": -120,
    "left": 47.45,
    "rotate": 90,
    "attrs": { "value": "220" }
  }
],
"connections": [
  [ "uno:GND.2", "lcd1:GND", "black", [ "v0" ] ],
  [ "uno:5V", "lcd1:VCC", "red", [ "v0" ] ],
  [ "lcd1:SDA", "uno:A4", "green", [ "h0" ] ],
  [ "lcd1:SCL", "uno:A5", "green", [ "h0" ] ],

```

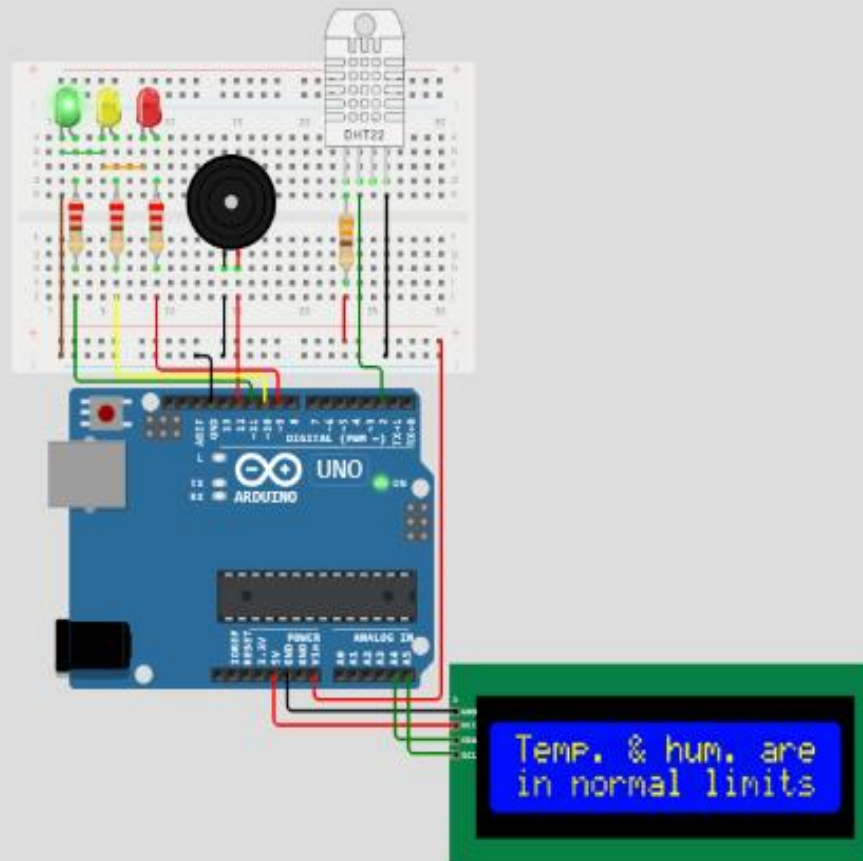
```

[ "bb1:8t.c", "bb1:5t.c", "orange", [ "v0" ] ],
[ "bb1:2t.b", "bb1:5t.b", "limegreen", [ "v0" ] ],
[ "bb1:15b.j", "uno:12", "red", [ "v16.23", "h-10.31" ] ],
[ "uno:11", "bb1:3b.j", "green", [ "v-13.22", "h-124.8" ] ],
[ "uno:10", "bb1:6b.j", "yellow", [ "v-17.34", "h-105.5" ] ],
[ "uno:9", "bb1:9b.j", "red", [ "v-20.88", "h-86.2" ] ],
[ "bb1:2t.e", "bb1:bn.1", "#8f4814", [ "v0" ] ],
[ "bb1:26t.e", "bb1:bn.21", "black", [ "v0" ] ],
[ "uno:VIN", "bb1:bp.25", "red", [ "v17.12", "h90.17", "v-251.92" ] ],
[ "bb1:bp.19", "bb1:23b.j", "red", [ "v0" ] ],
[ "uno:2", "bb1:24t.e", "green", [ "v-22.73", "h-11.36" ] ],
[ "uno:GND.1", "bb1:bn.10", "black", [ "v0" ] ],
[ "bb1:14b.j", "bb1:bn.11", "black", [ "v0" ] ],
[ "led1:A", "bb1:3t.a", "", [ "$bb" ] ],
[ "led1:C", "bb1:2t.a", "", [ "$bb" ] ],
[ "r1:1", "bb1:3t.d", "", [ "$bb" ] ],
[ "r1:2", "bb1:3b.h", "", [ "$bb" ] ],
[ "r2:1", "bb1:23t.e", "", [ "$bb" ] ],
[ "r2:2", "bb1:23b.i", "", [ "$bb" ] ],
[ "bz1:1", "bb1:14b.h", "", [ "$bb" ] ],
[ "bz1:2", "bb1:15b.h", "", [ "$bb" ] ],
[ "led2:A", "bb1:6t.a", "", [ "$bb" ] ],
[ "led2:C", "bb1:5t.a", "", [ "$bb" ] ],
[ "led3:A", "bb1:9t.a", "", [ "$bb" ] ],
[ "led3:C", "bb1:8t.a", "", [ "$bb" ] ],
[ "r3:1", "bb1:6t.d", "", [ "$bb" ] ],
[ "r3:2", "bb1:6b.h", "", [ "$bb" ] ],
[ "r4:1", "bb1:9t.d", "", [ "$bb" ] ],
[ "r4:2", "bb1:9b.h", "", [ "$bb" ] ],
[ "dht1:VCC", "bb1:23t.d", "", [ "$bb" ] ],
[ "dht1:SDA", "bb1:24t.d", "", [ "$bb" ] ],
[ "dht1:NC", "bb1:25t.d", "", [ "$bb" ] ],
[ "dht1:GND", "bb1:26t.d", "", [ "$bb" ] ]
],
"dependencies": {}
}

```

Output:

## Simulation



Humidity: 9.50 %;  
Temperature: -25.10 Celsius.

Humidity: 9.50 %;  
Temperature: -25.10 Celsius.