Automatic Room Humidifier

DIY Project Team- I

Final Presentation


AUTOMATIC
ROOM
HUMIDIFIER
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IN BRIEF

- INTRODUCTION
- MOTIVATION
- HARDWARE COMPONENTS
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- WORK PLAN
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AUTOMATIC ROOM HUMIDIFIER

A ‘Humidifier’ is a device, primarily an electrical appliance, used to increase humidity (moisture) of a room.

There are many kind of humidifiers such as ultrasonic, evaporative and impeller humidifiers.

In this project we have made a Ultrasonic Humidifier by ourselves and automated it using an Arduino and Humidity Sensor.

MOTIVATION

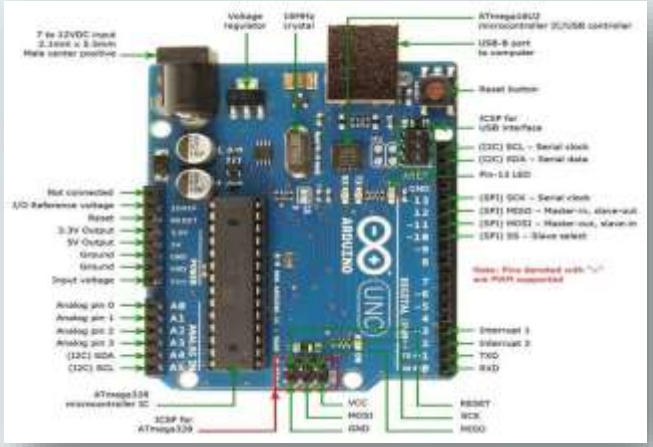
Due to the increasing rate of climate change, the climate is becoming more and more unpredictable. One effect of this is low humidity during the peak winter and summer months.

The adverse effects of low humidity include chronic dry skin, chapped lips, a scratchy throat, and an itchy nose. Hence to tackle this problem we are creating this **Automatic Room Humidifier**.

HARDWARE COMPONENTS

Arduino

- Microcontroller
- Controls electronics through inputs & outputs



No	Symbol	Function
1	VSS	Ground
2	VDD	5V +
3	V0	Contrast
4	RS	Register
5	RW	Read/Write
6	E	Enable
7	D0	Data bus
8	D1	Data bus
9	D2	Data bus
10	D3	Data bus
11	D4	Data bus
12	D5	Data bus
13	D6	Data bus
14	D7	Data bus
15	A	Anode (5V+)
16	K	Cathode (GND)

LCD 16X2 display

- 2 lines with 16 characters
- Each character 5X8 pixel matrix

HARDWARE COMPONENTS

DHT22 Temperature and Humidity Sensor

- Humidity and temperature sensor
- Accuracy : 2-5 %

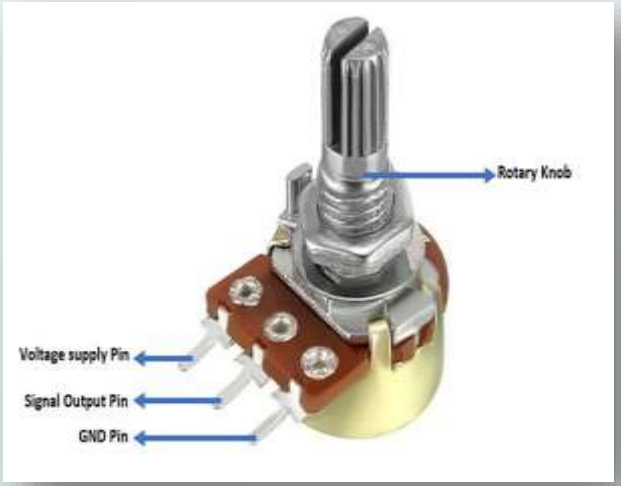
Relay

- High Voltage & High Current controller
- Operated in Normally Open mode (in this project)
- We are using 5V DC relay.

HARDWARE COMPONENTS

Mist maker

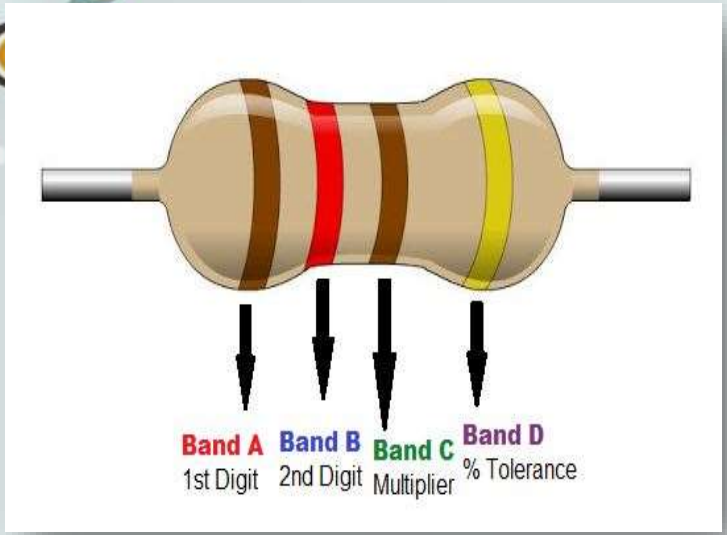
- Ultrasonic mist maker with piezoelectric transducer
- 24V DC, 1A



Potentiometer

- It provides variable resistance
- 10K Ω (in our project)

HARDWARE COMPONENTS



Resistors

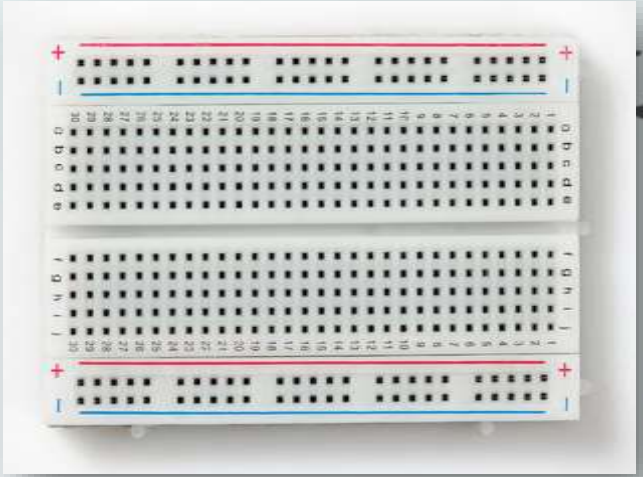
220Ω resistor
(in our project)

Fan

- 12V DC Powered
- Rating-12V,1A

HARDWARE COMPONENTS

Bread-Board



Jumper wires

HARDWARE COMPONENTS

9V DC Battery

Glue Gun

- It is used to melt adhesive and then stick things together using the liquid adhesive.
- Rating – 40W, 220-240V

HARDWARE COMPONENTS

Soldering Kit

It consists of the following components :

Soldering Iron

Hand-tool used in soldering which is used to supply heat.

Solder Wire

Solder wire is a fusible metal alloy wire used to join metal work pieces.

HARDWARE COMPONENTS

Soldering Kit

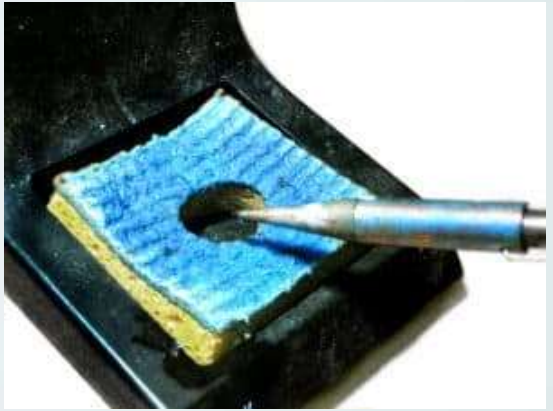
It consists of the following components :

Soldering Stand

Safe place to put the hot soldering iron

Wire Cutter

Very handy little tool used to cut wires



Wet Sponge

Inexpensive way of cleaning the tip of soldering iron.

SOFTWARES

Arduino IDE

Autodesk TinkerCAD

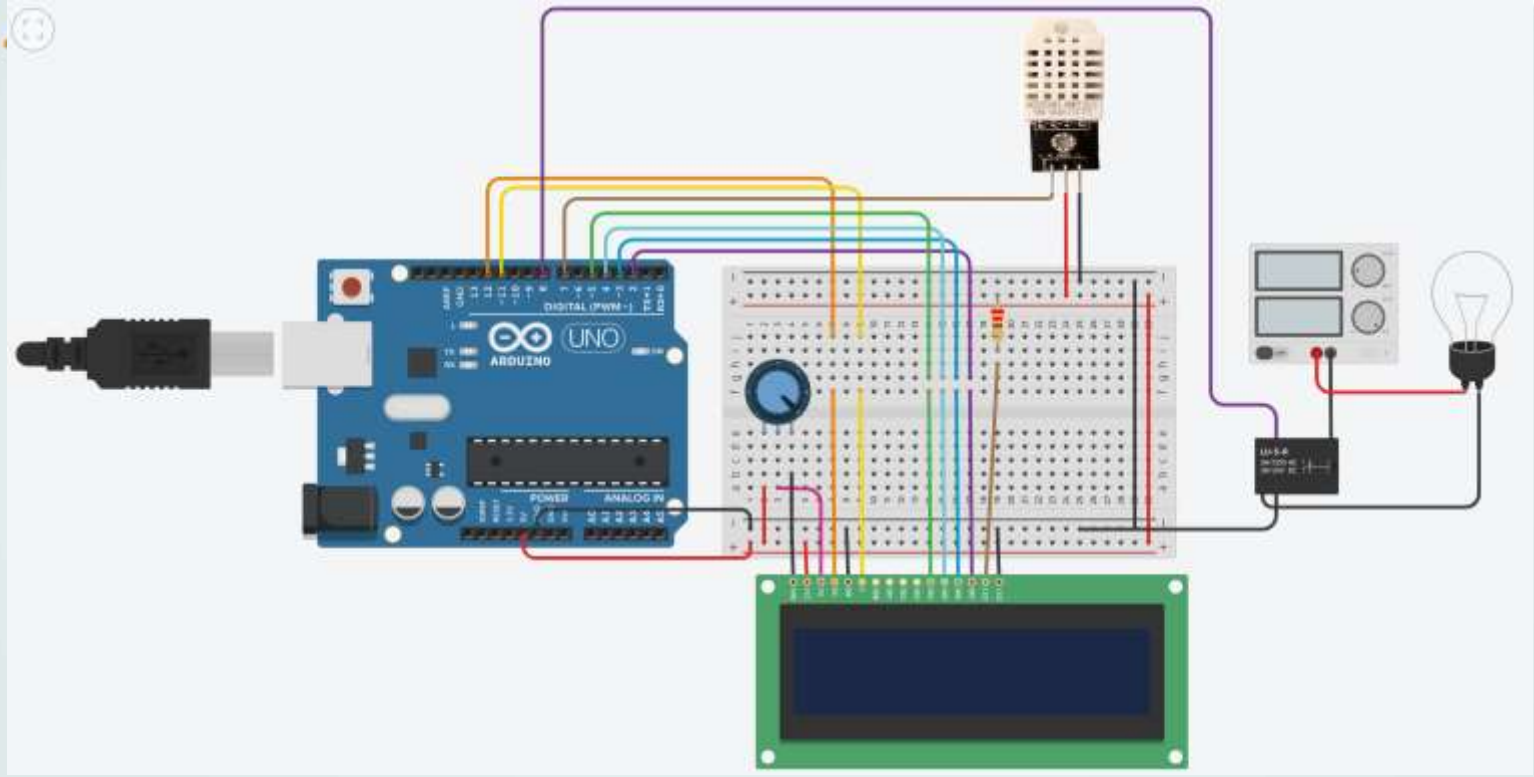
Libraries used :

- **<LiquidCrystal.h>** -For LCD Display
- **<dht.h>** -For DHT22 Temp & Humidity Sensor

WORK PLAN

❖ Circuit Schematic	Week-0
❖ Purchasing of Components (excluding Humidifier Setup)	Week-1
❖ Assembling of Circuit	Week-1&2
❖ Delivery of Humidity Sensor	Week-2
❖ Delivery of Mist Maker	Week-2
❖ Purchasing of DIY Humidifier components	Week-2
❖ Program of the Setup	Week-2&3
❖ Making of DIY Humidifier	Week-3
❖ Project Completion	Week-3

SCHEMATICS



*Here the Room Humidifier is replaced by the Light Bulb.

WORK DONE IN DETAILS

1. For this project first we made a general list of the required components and then selected the desired components from the huge tray of components.
2. Then we moved on to the purchasing of the components by local shops and ordered the components which were not available locally.
3. Till the arrival of all the components, we started having discussions regarding the working of different components and also made schematic.
4. After arrival of the parts, we first made the Arduino circuit, set up the LCD Display and the DHT22 Humidity and Temperature Sensor and then did the programming.
5. Then we moved to the next phase of making of the DIY Humidifier using the fan and Mist-maker.
6. During the above two steps we were also solving the problems which were encountered by us.
7. After the completion of two discrete phases of the project, we merged them using a relay.
8. We now moved on to make the project aesthetically pleasing and our project was **COMPLETE** .

PROGRAM

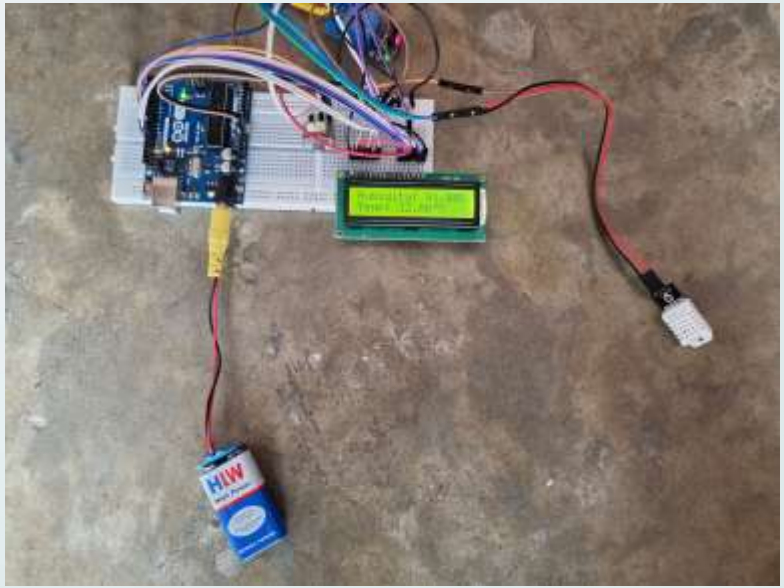
```
#include <LiquidCrystal.h>
#include <dht.h>

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

byte deg[8] = {
  0b00111,
  0b00101,
  0b00111,
  0b00000,
  0b00000,
  0b00000,
  0b00000,
  0b00000
};

dht DHT;

float hum;
float temp;
```

```
void setup() {
  lcd.createChar(0,deg);
  lcd.begin(16,2);
  pinMode(7,OUTPUT);
}

void loop() {
    int chk = DHT.read22(8);
    //Read data and store it to variables hum and temp
    hum = DHT.humidity;
    temp= DHT.temperature;
    //Print temp and humidity values to LCD
    lcd.setCursor(0,0);
    lcd.print("Humidity: ");
    lcd.print(hum);
    lcd.print("%");
    lcd.setCursor(0,1);
    lcd.print("Temp: ");
    lcd.print(temp);
    lcd.write(byte(0));
    lcd.print("C");

    if(hum<=40)
    {
      digitalWrite(7,HIGH);
    }

    delay(2000);
}
```

STILLS OF THE PROJECT

Below, you can see that the humidity reading is ‘91.80%’. Hence in the image the humidifier is OFF.

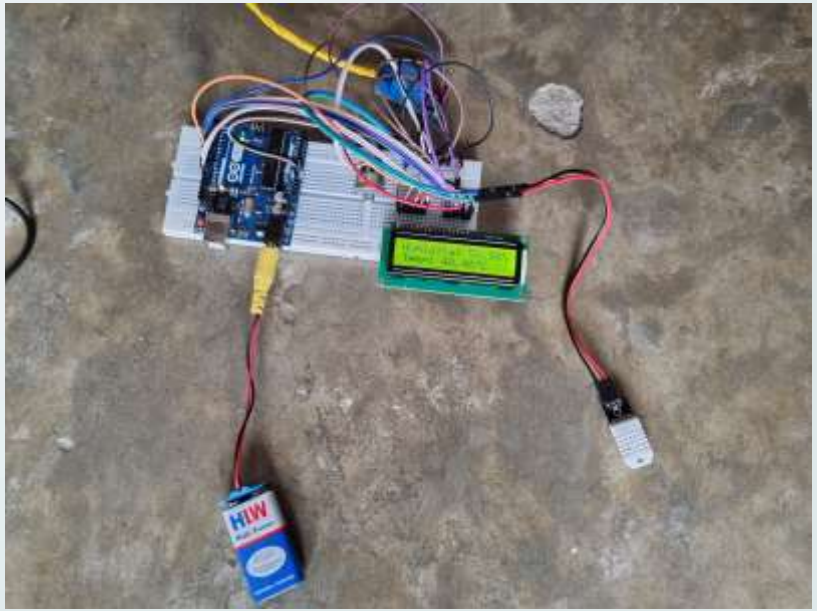
In the right image, you can see reading of the humidifier closely.



STILLS OF THE PROJECT

Below, you can see that the humidity reading is ’58.50%’. Hence in the image the humidifier is ON.

In the right image, you can see reading of the humidifier closely.



REFERENCES

- DIY Humidifier - https://youtu.be/GzB21JOmbBM
- Learning Soldering - https://youtu.be/6D5nylyWTK0
- LCD Setup - https://youtu.be/Mr9FQKcrGpA
- Custom Character generator for LCD - http://omerk.github.io/lcdchargen/
- DHT22 Temp and Hum Sensor Setup and ‘<dht.h>’ library download - https://www.ardumotive.com/how-to-use-dht-22-sensor-en.html

WORK SHARING

Assembling and Programming

—YASHRAJ SINGH
(20CS10079)

Circuit Design and Programming

—NIKHIL SARASWAT
(20CS10039)

Background & Research Work

— SIRIPURAM BHANU TEJA
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Background & Research Work

—GONUGUNTLA SWATHI
(20CS30020)

Link to Youtube Video

https://youtu.be/KEvwqEnCCts


Thank You!