

# Weather Monitoring & Control System

ISA PROJECT

**COMPONENTS REQUIRED**

**Hardware:**

- Arduino Uno
- DHT11 Temperature & Humidity Sensor
- Relay Module
- TFT LCD Display
- Jumper Wires
- Battery (9V)
- Fan (12V)

**CIRCUIT DIAGRAM**

**Arduino UNO (CODE CONTROLLER)**

**DHT11 Temperature & Humidity Sensor**

**THANK YOU!**

**WORKING**

**WHAT IS WEATHER STATION?**

**INTRODUCTION**

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# The Team

Class: E2D Branch: E&TC Engineering

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2. **E270 - Tushar Ingle**
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# INTRODUCTION

- In this project we've built a weather station using different types of sensors & arduino. Which can measure different weather conditions.
- Nowadays, weather forecasts can be measured through various platforms or mobile devices, but building a weather station offers hands-on learning and customization.

# WHAT IS WEATHER STATION?

- As the name suggests, it is something related to weather. So, the term, "Weather Station" refers to measuring the data related to current weather conditions or to predict the future weather forecasts.
- The conditions could be temperature, humidity, atmospheric pressure, etc.

# USES

- Weather stations are used by meteorologists, gardeners, farmers, trekkers, students, pilots or anyone who enjoys knowing about weather or relies on weather conditions for the decision making either related to work or something else.
- Provides real-time weather data for personal or educational purposes.
- Enhances understanding of Arduino programming and sensor integration.

# CASE STUDY



- We have visited the actual weather station for case study. It was a project named as SAFAR-Pune by IITM, Pune located in MITAOE Alandi Campus.
- During our visit, we got to know about how weather station actually works and it's functioning depending on various weather conditions.
- We saw real time air quality captured by the weather station which gave us more information about the AIQ and more.

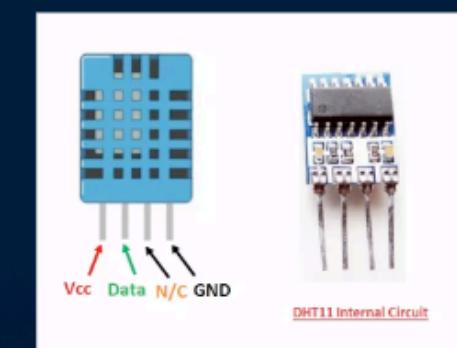
# COMPONENTS REQUIRED

## Hardware:

- Arduino Uno



- DHT11 Temperature & Humidity Sensor



- Relay Module



- TFT LCD Display



- Jumper Wires



- Battery (9V)



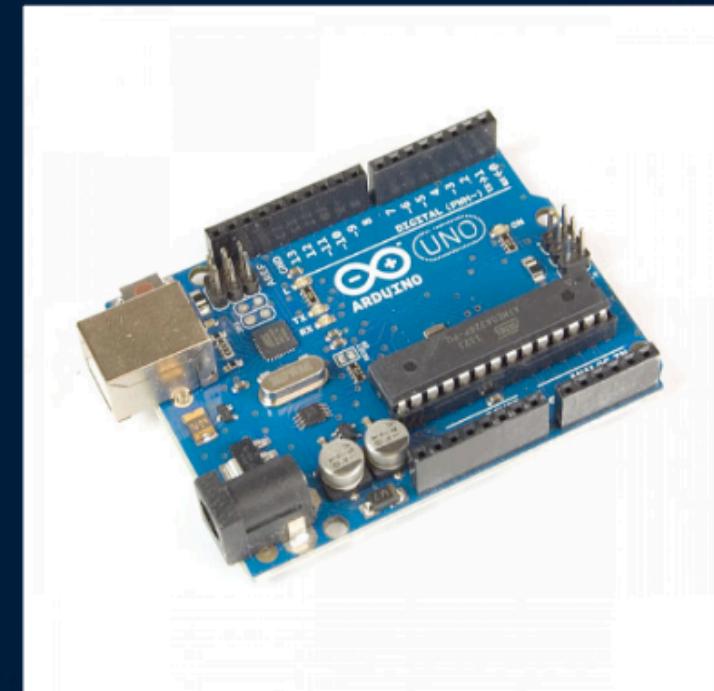
- Fan (12V)



# Arduino Uno (MICROCONTROLLER)

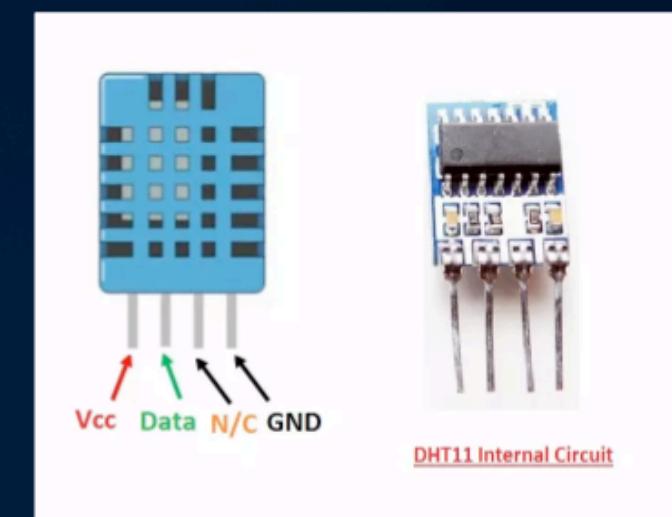
The Arduino Uno is a microcontroller board which is based on the ATmega328.

<b>Microcontroller</b>	<b>ATmega328</b>
<b>Analog I/O Pins</b>	<b>6</b>
<b>Clock Speed</b>	<b>16 MHz</b>
<b>Digital I/O Pins</b>	<b>14 (of which 6 provide PWM output)</b>
<b>EEPROM</b>	<b>1 kb</b>
<b>Flash Memory</b>	<b>32 KB of which 0.5 KB is used by the bootloader</b>
<b>Input Voltage</b>	<b>7-12V</b>
<b>Operating Voltage</b>	<b>5V</b>
<b>SRAM</b>	<b>2 kb</b>



# DHT11 Temperature & Humidity Sensor

The DHT11 Temperature And Humidity Sensor is a small humidity and temperature sensor.



<b>Humidity Measurement Accuracy</b>	<b>±5.0% RH</b>
<b>Humidity Measurement Range</b>	<b>20% to 90% RH</b>
<b>Response Time</b>	<b>&lt;5 seconds</b>
<b>Temperature Measurement Accuracy</b>	<b>±2.0°C</b>
<b>Temperature Measurement Range</b>	<b>0°C to +50°C</b>
<b>Length</b>	<b>2.3 cm</b>
<b>Height</b>	<b>0.55 cm</b>
<b>Width</b>	<b>1.2 cm</b>

# Relay Module

It is used to control various appliances and other types of equipment with a large current.

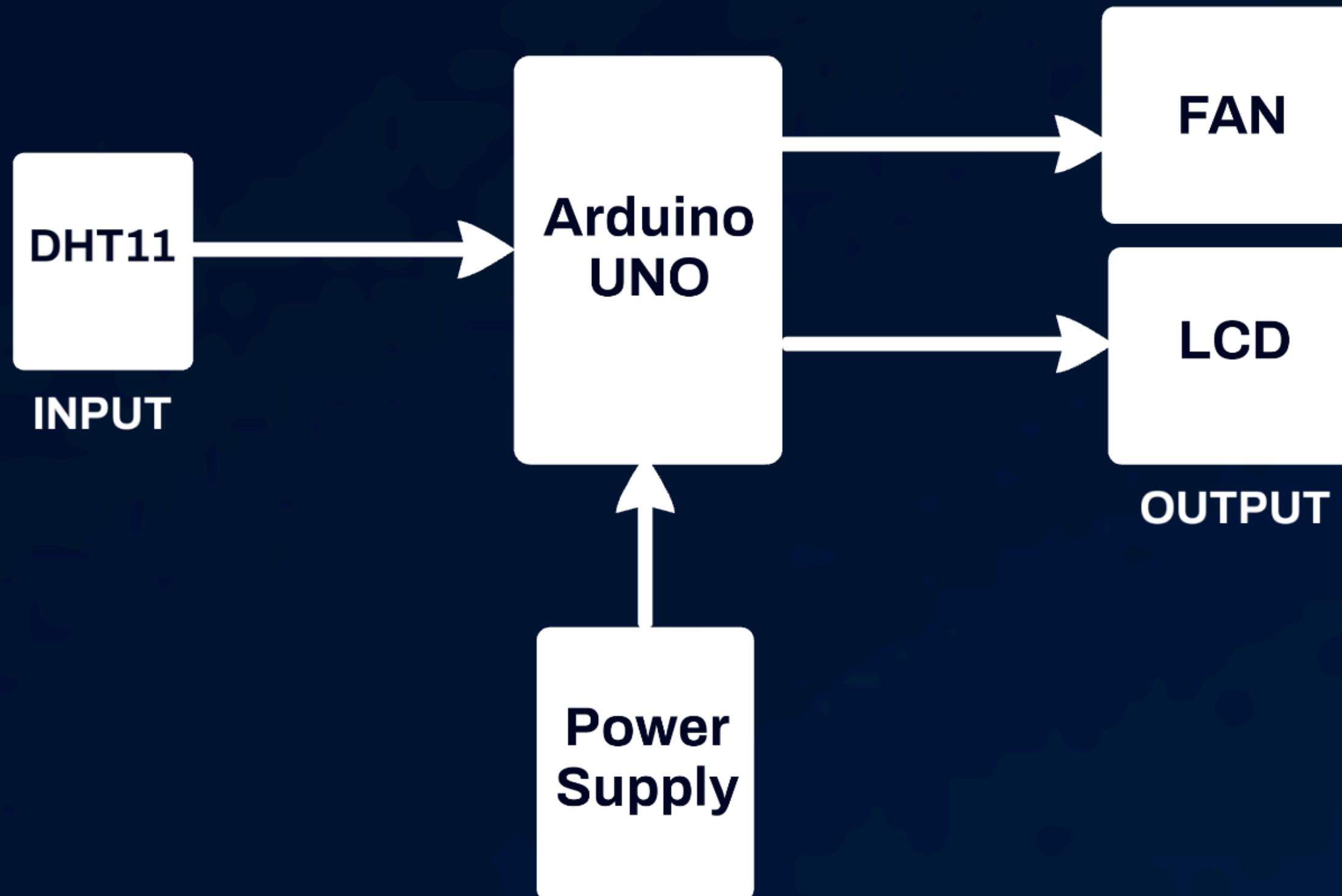


<b>No. of Channels</b>	<b>2</b>
<b>Operating Temperature Range</b>	<b>-40 to 85 °C</b>
<b>Operating Voltage</b>	<b>2.5 ~ 5.5 V (DC)</b>
<b>Switching Voltage(AC)</b>	<b>240V@10A</b>
<b>Switching Voltage(DC)</b>	<b>30V@10A</b>
<b>Trigger Current</b>	<b>20 mA</b>
<b>Trigger Voltage</b>	<b>5V (DC)</b>
<b>Length</b>	<b>4.3 cm</b>
<b>Height</b>	<b>1.7 cm</b>
<b>Width</b>	<b>4.3 cm</b>

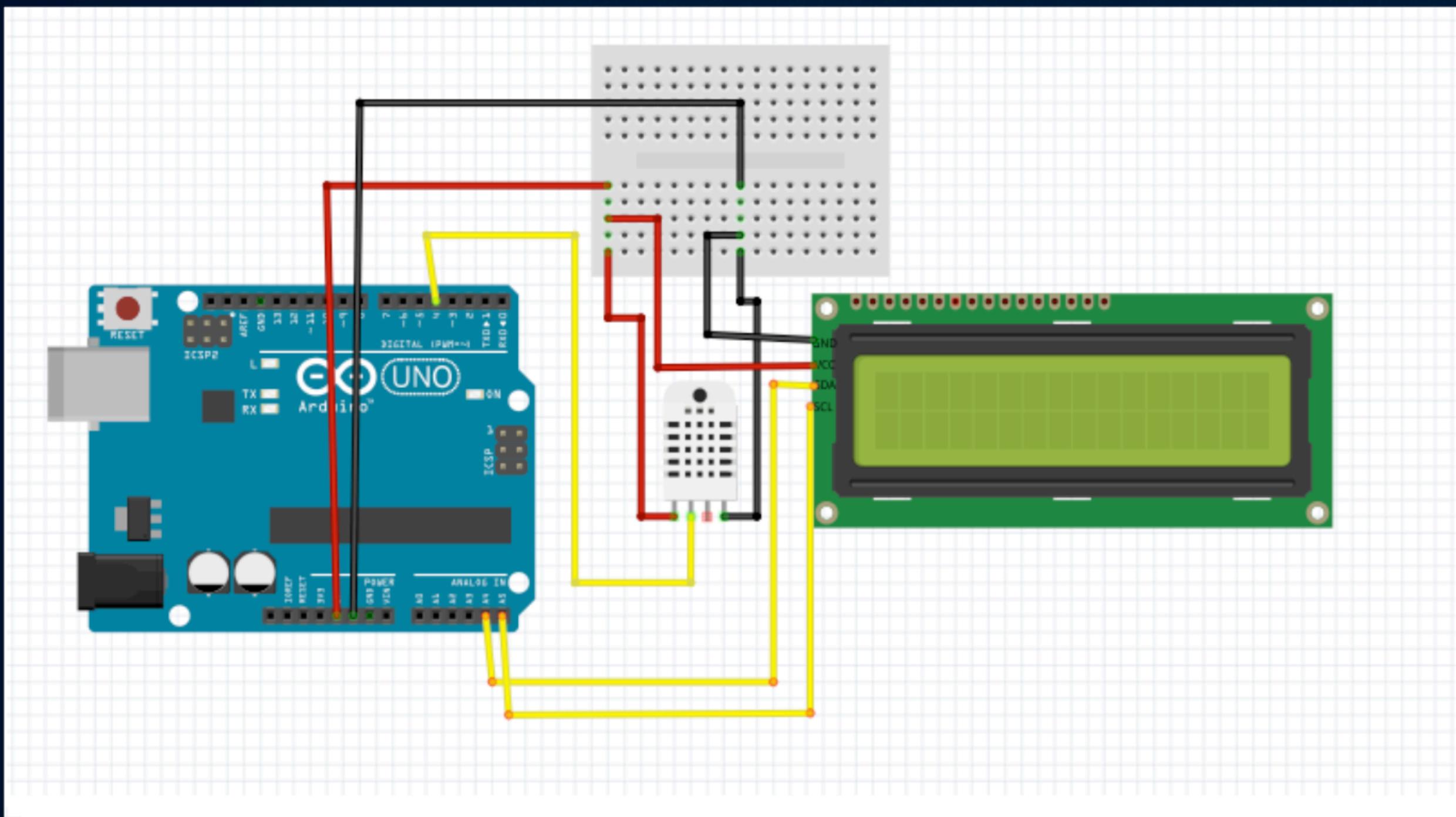
# WORKING

- The weather station comprises of three parts: collecting the real-time weather data, processing the data in the Arduino board, showing the data to the user on the LCD & controlling the weather changes using fan.
- The sensors DHT11 collects the data in real-time. That data is then converted into electrical signals. These signals are then sent to the Arduino board.
- Arduino board compiles these signals. Then sends the appropriate data in the form of electrical signals to the TFT LCD.
- The LCD then shows the final output to the user. And the fan turns on if the set threshold of 40°C gets crossed.
- All these processes happen in real-time. So the data also gets updated in real time.

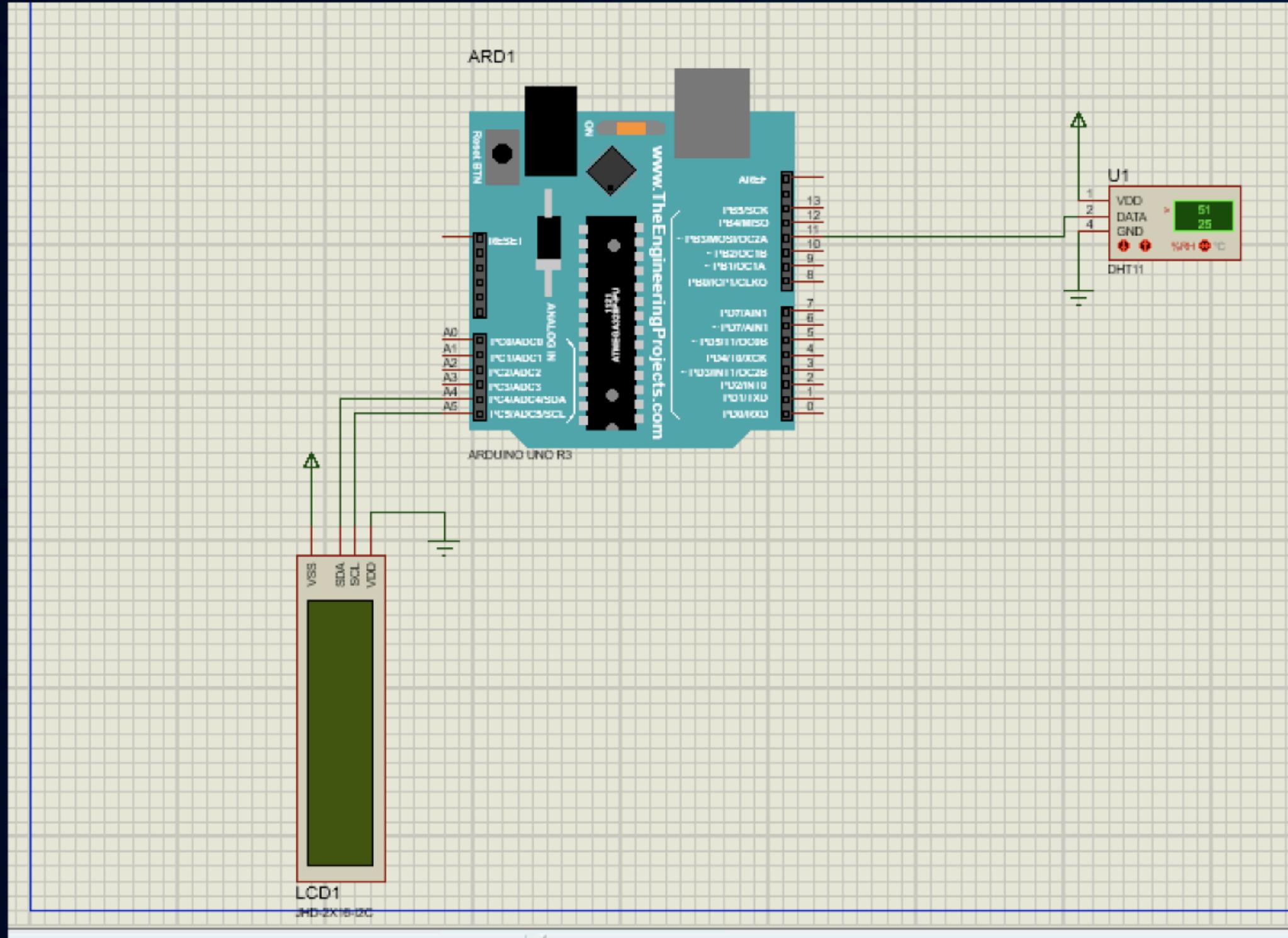
# BLOCK DIAGRAM



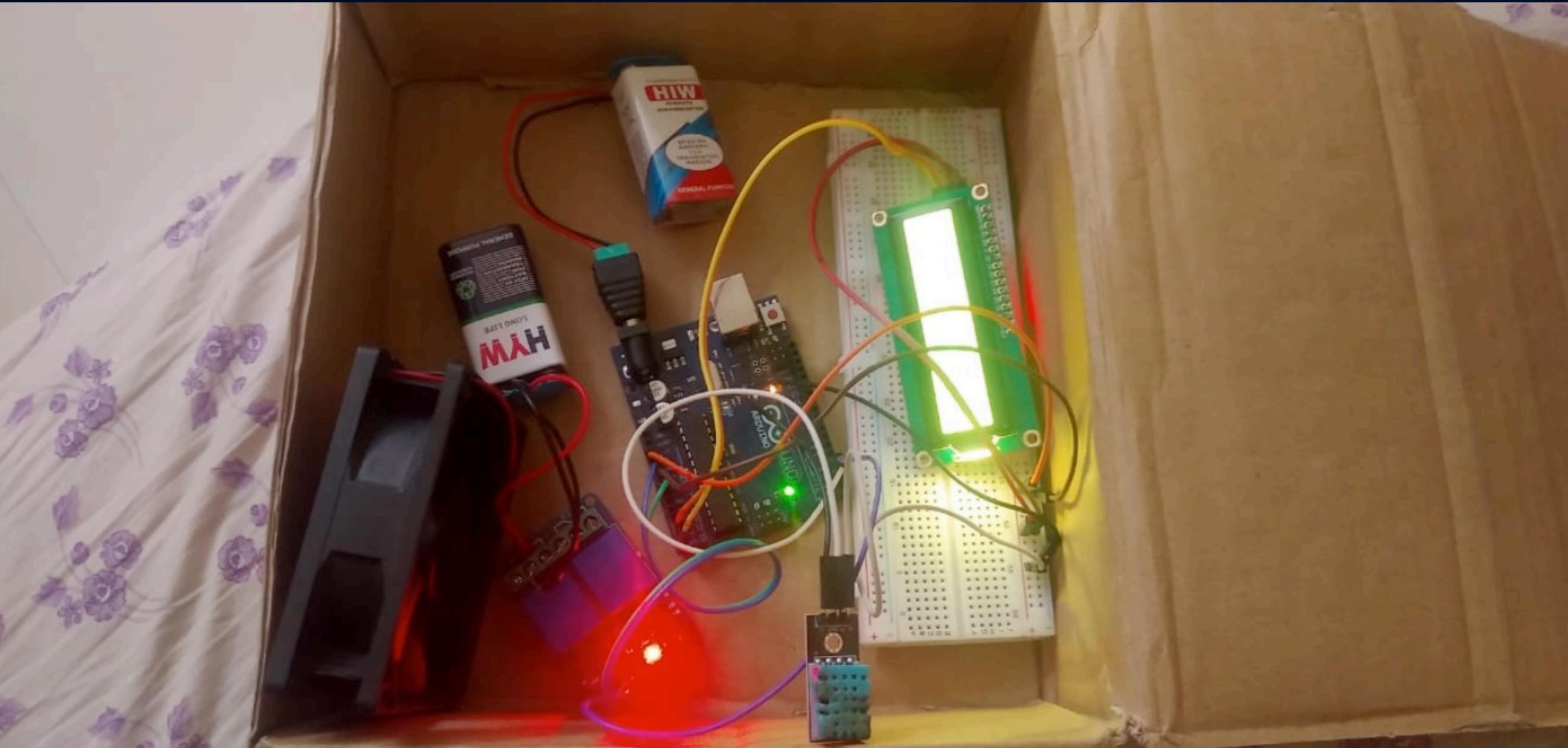
# CIRCUIT DIAGRAM



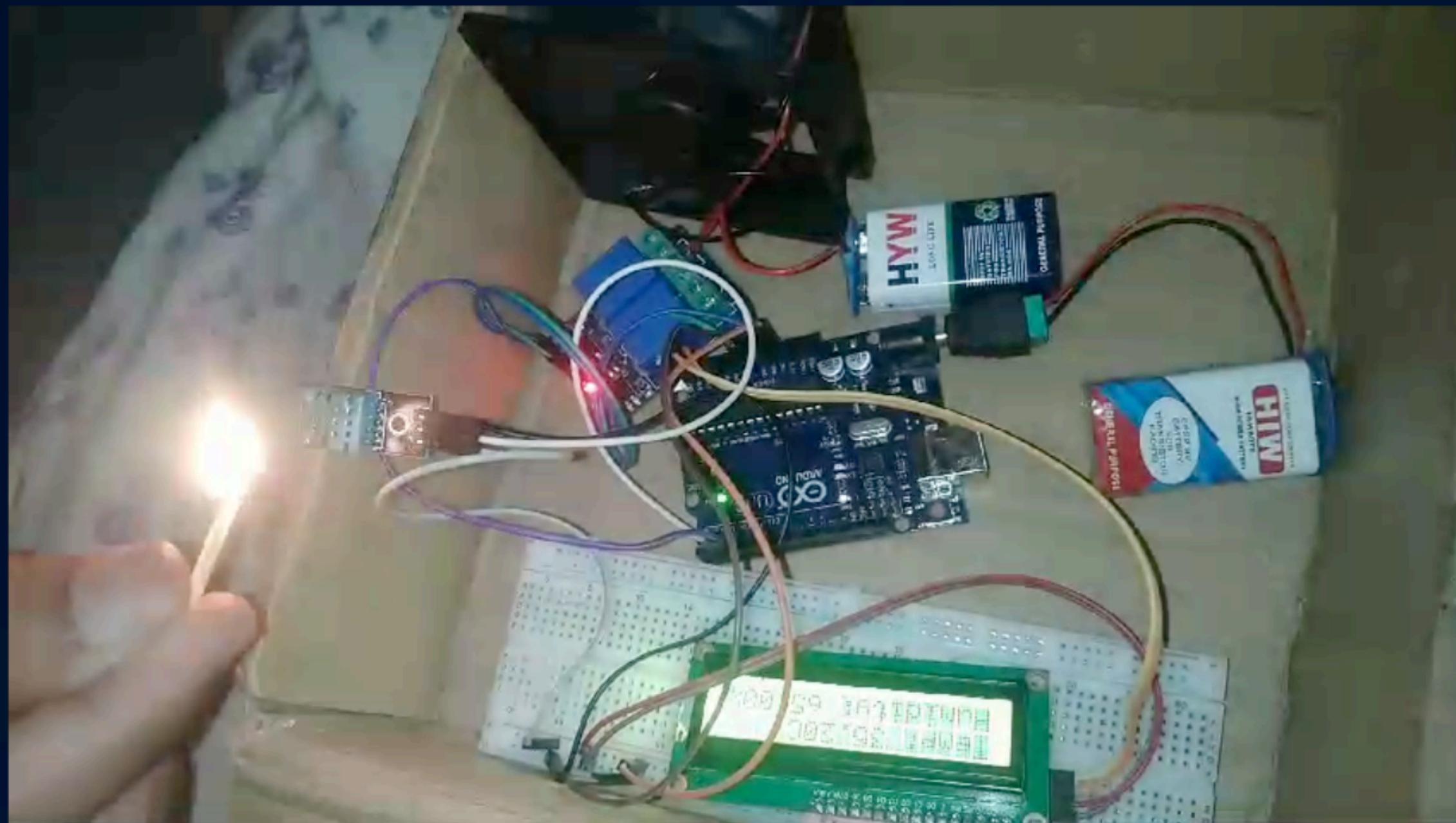
# SIMULATION



# BREADBOARD TESTING

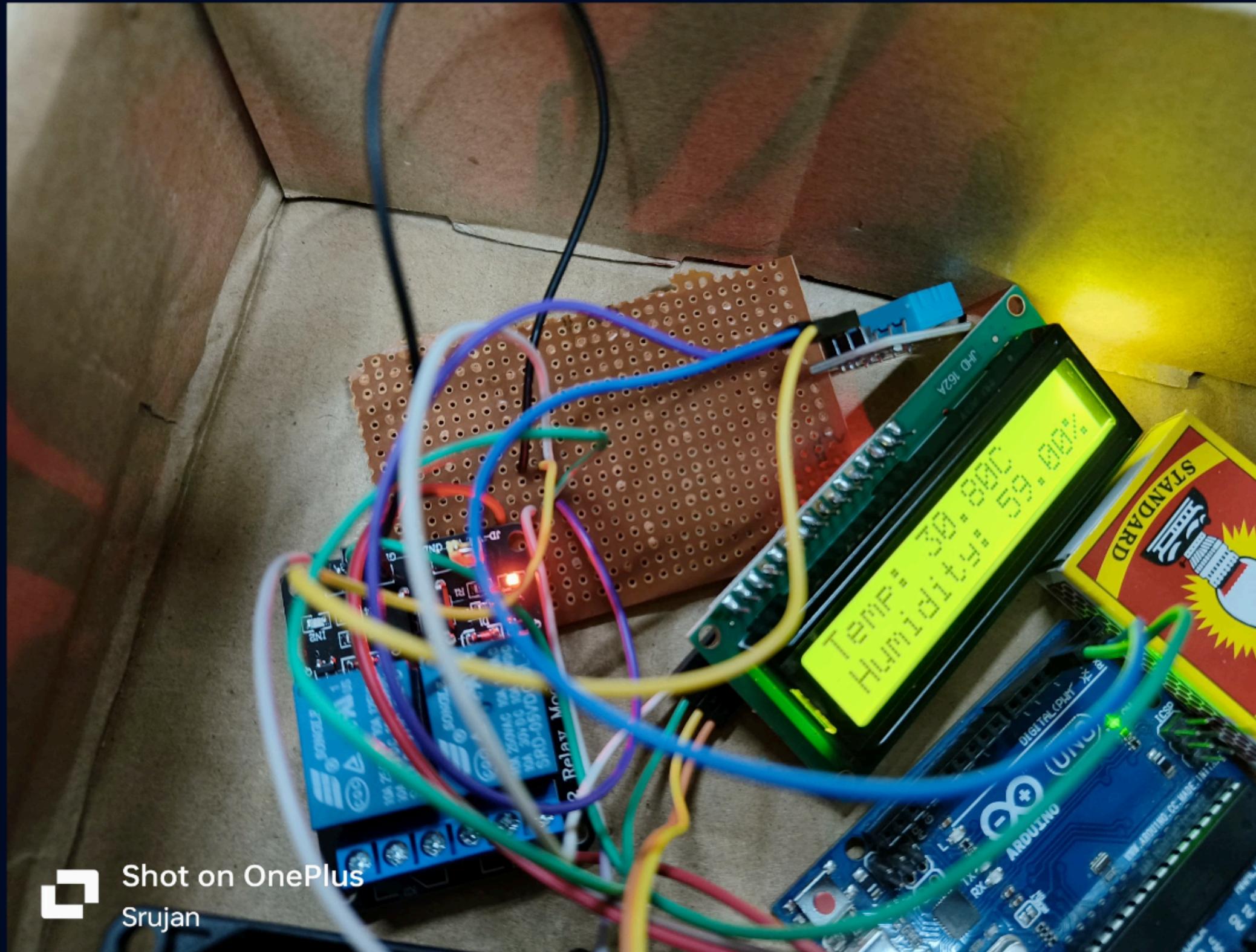


# VIDEO



Link: <https://drive.google.com/file/d/1RGES5BXdvfQZ1eCrrgtXwcDOSFxeF1e6/view?usp=sharing>

# CONNECTED WITH PCB



Shot on OnePlus  
Srujan



Prezi

# MISTAKES & PROBLEMS FACED

- First time, connections were not done properly on breadboard so it was not working. So, after working on it. The whole system worked.
- There was a arduino code problem as well but after referring other similar projects we were able to fix it.
- The proteus simulation of the project didn't work. Because we didn't got actual components into it. So, we used alternatives to them but still it didn't work.

# CONCLUSION

- We have successfully monitored the weather using temperature & humidity sensor.
- And showcased it on LCD display.
- Then, controlled it using arduino uno microcontroller.
- And triggered the fan once the threshold surpasses.

# THANK YOU!



Prezi