

# **Arduino Based Weather Station**

Project report submitted in partial fulfillment of the degree of  
Electronics and Communication Engineering

For the course

**Design Lab**

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## Abstract

Arduino is an open source with hardware and software facility. The Arduino Uno has fourteen digital input/output pins, six analog inputs, a USB connection, a power jack, a reset button. The digital inputs on the Arduino are what allow you to connect the Arduino sensors, actuators, and other ICs. In making the arduino based weather station we will use the temperature and humidity sensor DHT11. It detects the temperature between range 0 to 50°C and humidity range from 20 to 90 RH in a range of 20m. Resistors will be used to resist the flow of current and a LCD is used to display the result message.

## 1 MOTIVATION

The weather station will help us to know the weather by measuring the temperature and relative humidity and displaying the result on a LCD. It can be a personal weather station which we can use in our homes or factories where weather forecasting services are not available. It might help event organisers or farmers as well.

## 2 PROPOSED SOLUTION

In order to make a weather station using arduino we will use the temperature and humidity sensor that will give a message of whether the weather is hot, cold or humid on LCD screen. A pair of jumper wires, resistors and potentiometer.

### 2.1 ARDUINO UNO

The arduino uno has physical part and a software part which is used to write code. Arduino Uno is a microcontroller board based on the ATmega328P. The Arduino Uno has fourteen digital input/output pins, six analog inputs, a USB connection, a power jack, a reset button and much more. It contains everything needed to support the in-built micro controller. It can be powered via an AC-to-DC adapter or battery. It can also get power supply from the computer when it is connected with a USB cable.

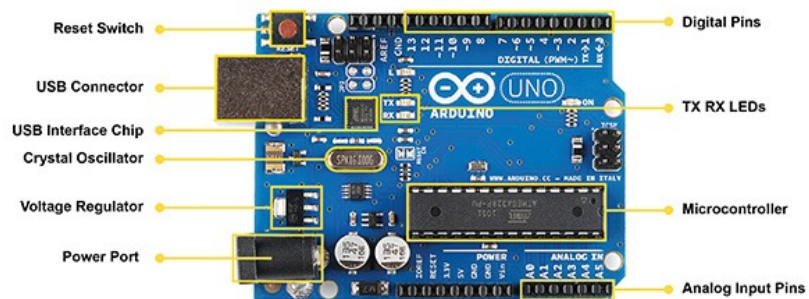


Figure 2.1: Arduino Uno

## 2.2 DHT11

DHT11 Temperature Humidity Sensor features a temperature humidity sensor complex with a calibrated digital signal output. This sensor includes a resistive-type humidity measurement component. Its small size, low power consumption and up-to-20 meter signal transmission. The component is 4-pin single row pin package. It is convenient to connect. DHT11's power supply is 3-5.5V DC.

Temperature Range	Temperature accuracy	Humidity Range	Humidity accuracy
0-50°C	2 percent	20-80 RH	5 percent

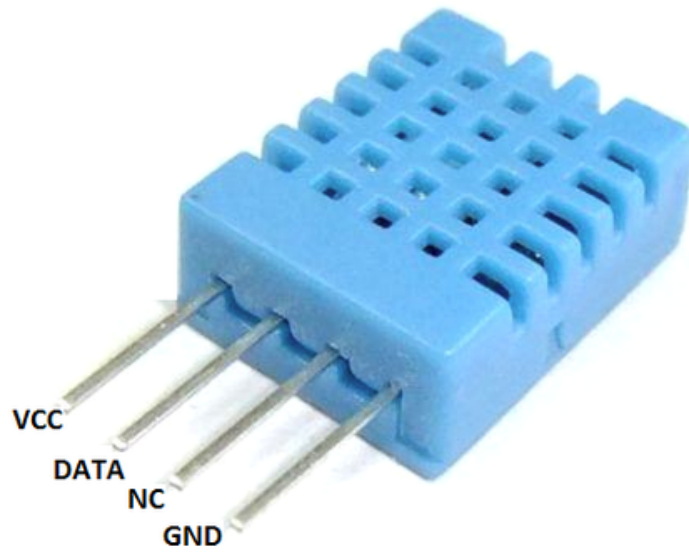


Figure 2.2: DHT11

## 2.3 LCD

The use of LCD in this project is to display the message of the the weather station. The LCD has 16 pins out of which lesser number can be used if the output displayed is using only 4 data lines. The operating voltage of this LCD is 4.7V - 5.3V.

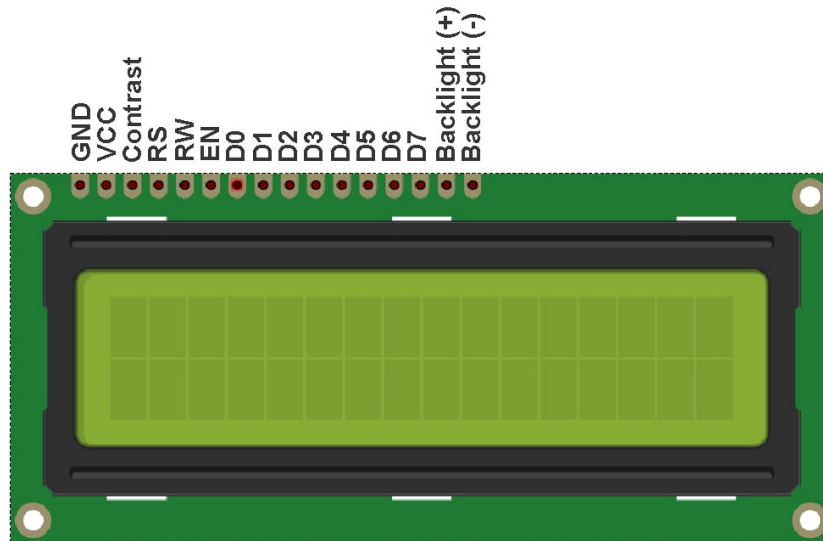


Figure 2.3: LCD

### 3 CODE AND CIRCUIT

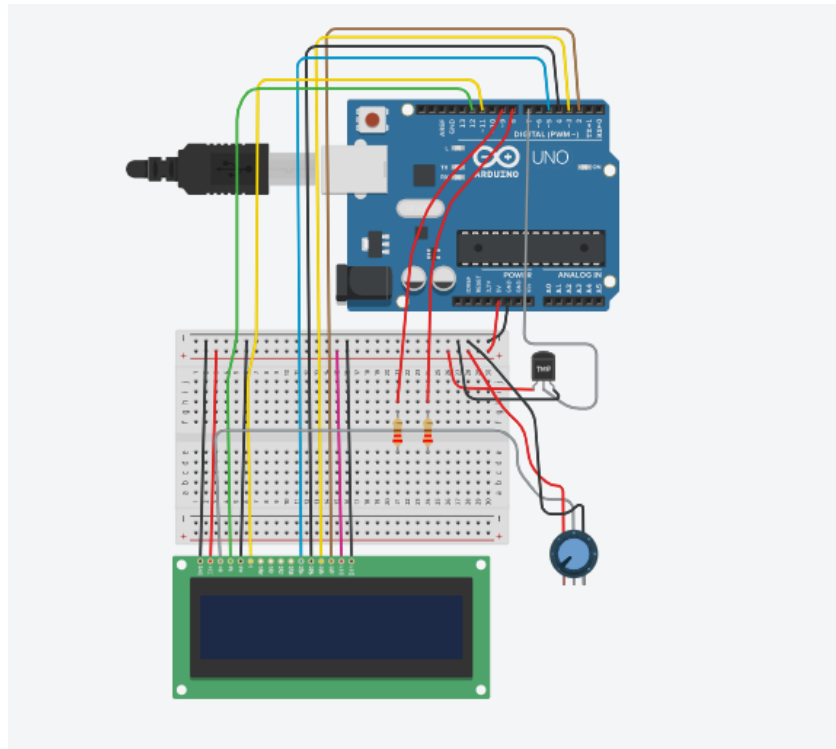


Figure 3.1: Circuit on tinkercad

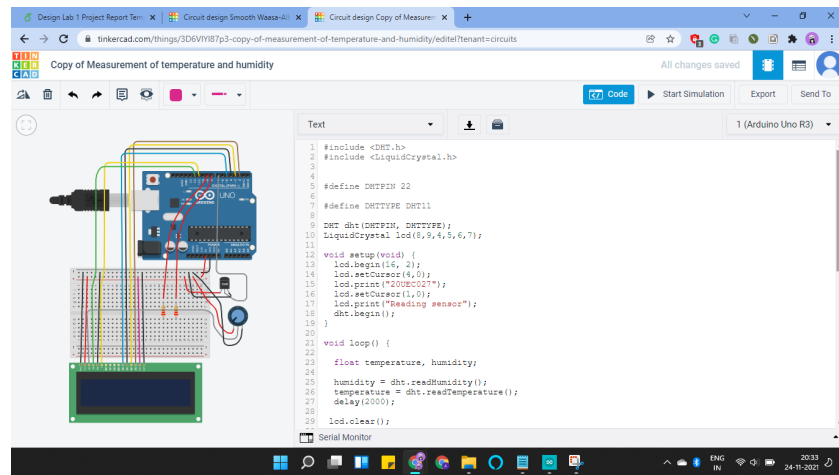


Figure 3.2: Code

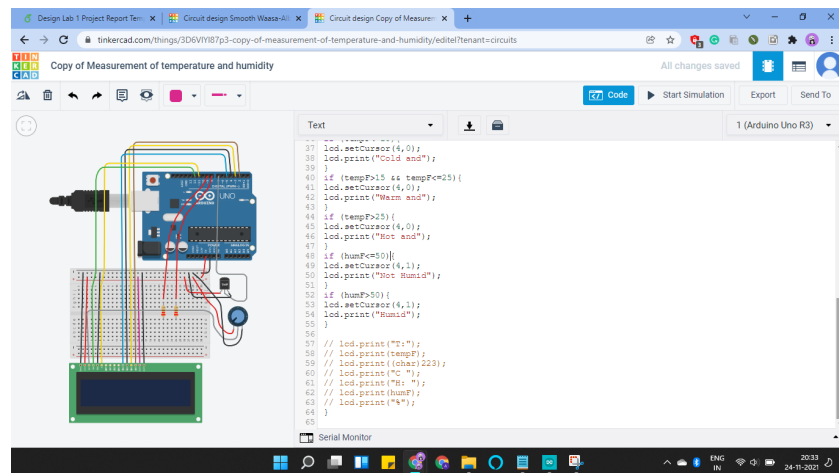


Figure 3.3: Code

## 4 CONCLUSION AND FUTURE WORK

We created this code by using liquid crystal and DHT11 libraries. A delay of 5 sec is required to get reliable output from DHT11 sensor. The given screenshot shows the message that weather is HOT or COLD and the percentage of humidity based on the results of DHT11 sensor.

The weather station can pop up a message on the user's phone whenever there is a change in weather so that they can be notified even if they are away from LCD screen.

## 5 REFERENCES

<https://www.electronics-lab.com/project/arduino-weather-station-using-dht11/>

<https://www.electronicclinic.com/arduino-weather-station-using-dht11-and-display-data-on-gauges/>

## REFERENCES