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### Overview

The objective of this project is to create an evaporating cooler system using an Arduino Mega 2560. The system includes various components such as the DHT11 temperature and humidity sensor, water level sensor, four push buttons, a liquid crystal display (LCD), a fan motor powered by an additional power supply and L293D IC, and four LEDs of different colors. The cooler system operates by monitoring the water levels in a cup and alerting the user if the water level becomes too low. It also measures the current air temperature and humidity, displaying the readings on the LCD screen. The system can turn on and off the fan motor, and activate or deactivate the system using an on/off button. Additionally, the system records the time and date when the motor is turned on or off. The constraints of the system include the switch buttons for the vent.

The DHT11 temperature and humidity sensor uses a capacitive humidity sensor and a thermistor to measure the temperature. It sends a digital signal to the data pin, which records the results. The sensor is defined by DHT\_PIN 7 and DHT\_TYPE DHT11, and the temperature and humidity values are recorded using the DHT.h library and readTemperature() and readHumidity() functions. The temperature reading changes states from idle to running and vice versa.

The water level sensor acts as a monitor for the amount of water present in the system. It changes states from idle/running to error and vice versa by identifying the presence of a surrounding liquid. The sensor checks the water level using the adc\_read() function and compares it with the WATER\_THRESHOLD. If the value falls below the threshold, it returns an error state. The sensor is defined by WATER\_LEVEL on its designated pin.

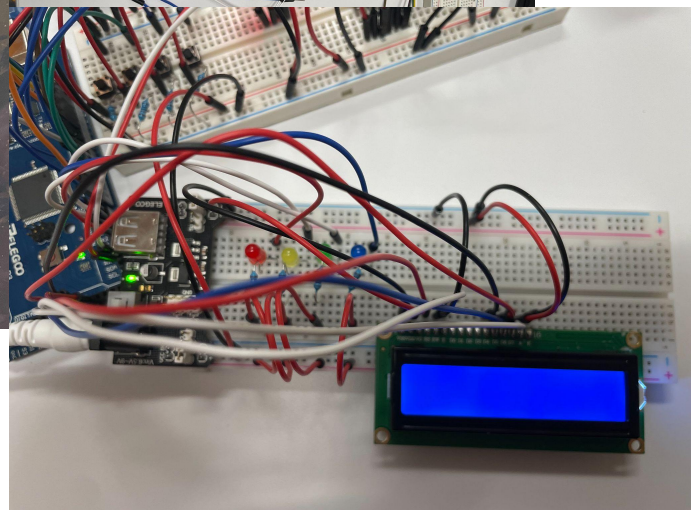
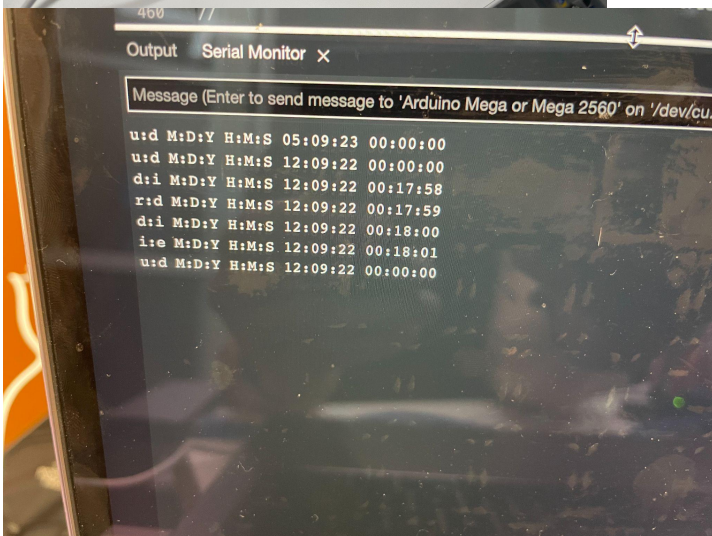
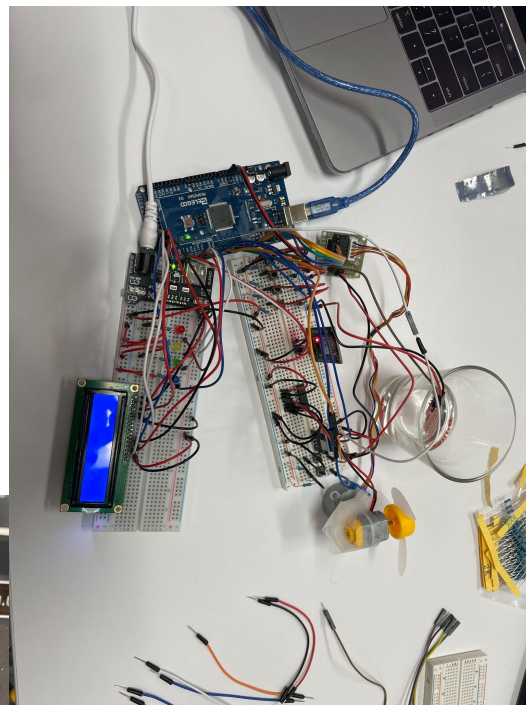
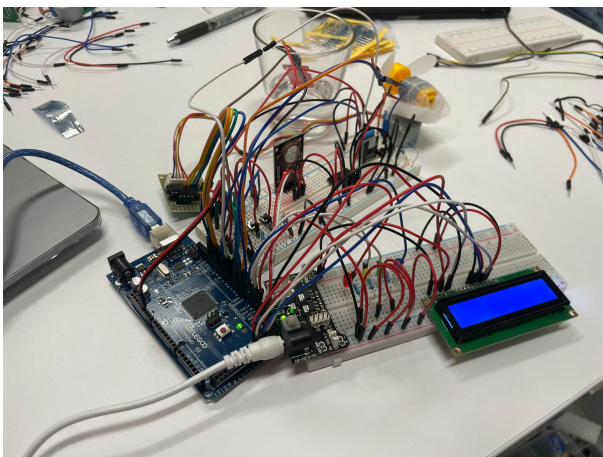
Four push buttons are included in the system, each with a specific function. BUTTON\_ON\_OFF switches the system between the disabled and enabled states. BUTTON\_RESET resets the system to its idle state. Two additional buttons, BUTTON\_STEPPER\_UP and BUTTON\_STEPPER\_DOWN, are used to control the direction of the vent. These buttons require limitations for the switch button setting.

The liquid crystal display shows the current air temperature and humidity readings recorded by the temperature and humidity sensor. The display uses the DS1307 module to ensure accuracy and shows an error message "Error: low water" when the water levels fall below the threshold. The display is defined by lcd in the LiquidCrystal.h library, and the RTCLib.h is used to set the DateTime() function for the projected results.

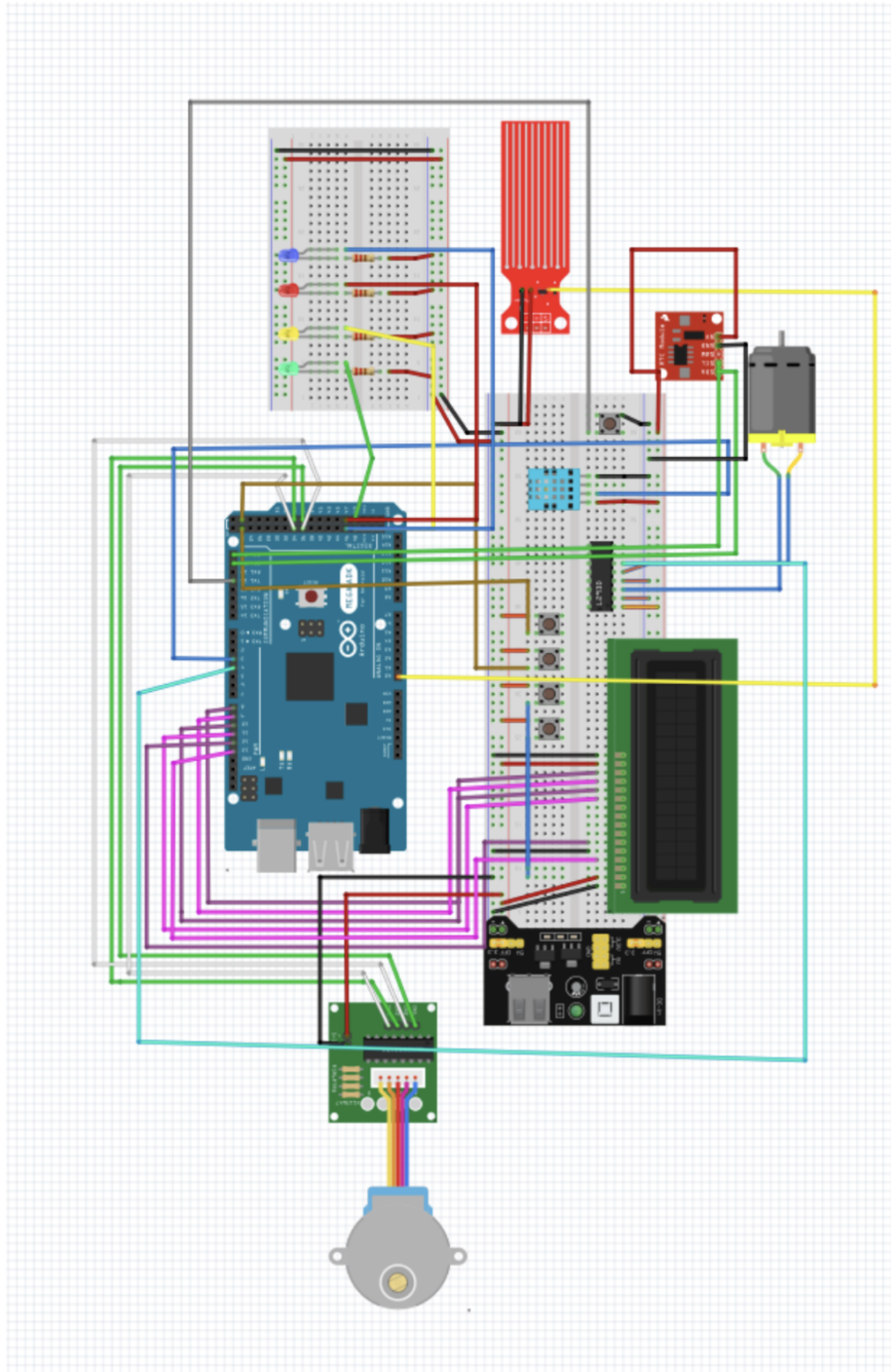
The fan motor is powered by the L293D IC chip and runs only when the system is enabled through appropriate water levels and temperature values. The motor is defined by MOTOR\_PIN and can be set to disabled, idle, or running states depending on the conditions. The fan's speed is controlled using the setFanMotor() function when in the enabled state. The motor's direction is controlled using the L293D pinout sheet and the direction control pins. The motor is supported by the 545043 power supply, which provides an additional direct power source.

The system also includes four LEDs of different colors, each representing a different state of the project's components. The green LED is lit when the circuit is in idle, the yellow LED indicates that the system is disabled, the blue LED shows that the necessary conditions have been met, and the system is running, while the red LED designates that the idle state has been interrupted, and an error has occurred. Each LED is defined by its individual color and delegated to its separate pin. The LED is powered using the turnLEDOn() function.

Pictures:



Schematic:



Specification Sheets:

**DHT11 Temperature and Humidity Module:**

<https://www.mouser.com/datasheet/2/758/DHT11-Technical-Data-Sheet-Translated-Version-1143054.pdf>

**LCD 1602 Module:**

[https://www.waveshare.com/datasheet/LCD\\_en\\_PDF/LCD1602.pdf](https://www.waveshare.com/datasheet/LCD_en_PDF/LCD1602.pdf)

**StepperMotor:**

<https://www.mouser.com/datasheet/2/758/stepd-01-data-sheet-1143075.pdf>