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CPE301

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### Final Project Overview

This final project consists of recreating a swamp cooler system with the Arduino Atmega 2560. This is done with various products such as the Water Level Detection Sensor Module, an LCD module, a step motor, a fan and motor, an L293D, a potentiometer, a real time clock, a power source module, and a temperature and humidity sensor.

The Water Level Detection Sensor is setup using self-made adc functions. What it does is read the water level of the cooler. If the water level is too low the cooler will throw an error, and otherwise it will be in its running or idle state.

The LCD module is done using the LiquidCrystal library. It is connected to the digital pins 13-8 and it displays information about the state of the cooler as well as the temperature and humidity levels when the cooler is running. The LCD is allowed to work by the potentiometer used.

The step motor is done using the Step library. It is connected to the power source module and it rotates the vent so that it can go in different directions. This is controlled by a button.

The motor and fan are used with the analogWrite(0) functions. They are plugged into the digital pin 44 for input. I also used the L293D product to connect the power source to it so that it would not supply too much current to the Arduino. The motor just spins the fan to cool the system.

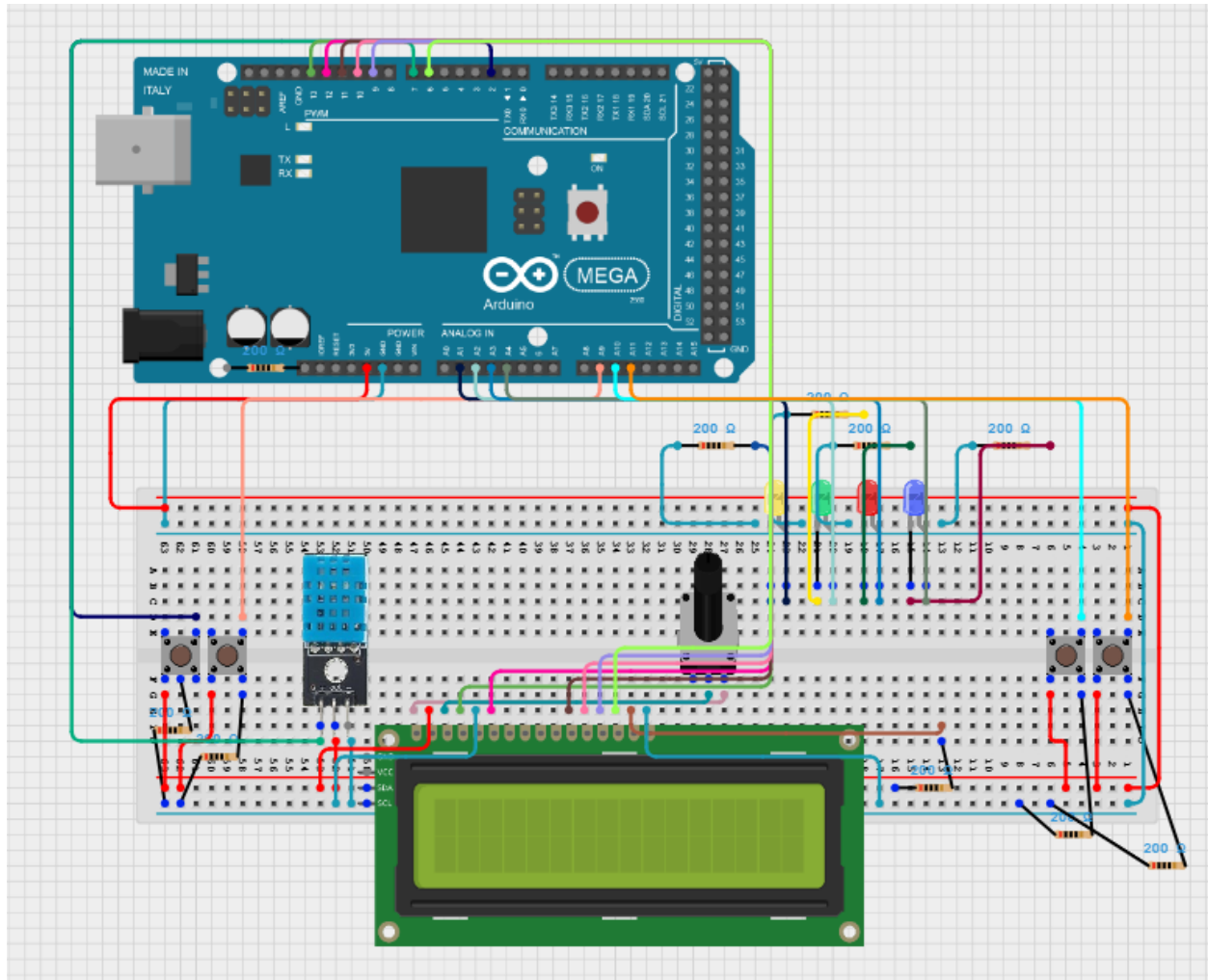
A real time clock is there to broadcast whenever the fan turns on or off. This is done using the RTC lib library

The temperature and humidity sensor will record the temperature and humidity of the environment. This is done using the DHT library. When the temperature is low enough the cooler will go from its running state to its idle state and the fan will stop.

## States:

- Disabled
  - Cooler starts in the disabled state. Pressing the off button will also put it into the disabled state
  - The fan does not run and no reading are done on temperature, water level, or humidity
- Idle
  - When the environment reaches a certain temperature threshold the cooler will go into its idle state
  - The fan will not run, but water level, temperature, and humidity will still be read and recorded on the LCD
- Running
  - When the environment is above a certain temperature the cooler will go into its running state
  - The fan will run and water level, temperature, and humidity will be recorded and put on the LCD
- Error
  - When the water is below a certain level the cooler will go into the error state
  - An error message is recorded on the LCD
  - The fan will be off
  - Water level will still be recorded and the cooler will only go back to running or idle when the water level is sufficient and the reset button is pressed.

## Schematic:



Pictures:

Video:

[https://drive.google.com/file/d/1bXqmhxfqpuVL2ByqyLaFoVRZef6u1DwL/view?usp=drive\\_link](https://drive.google.com/file/d/1bXqmhxfqpuVL2ByqyLaFoVRZef6u1DwL/view?usp=drive_link)

Github: [https://github.com/Royce-D-O/CPE301\\_Final](https://github.com/Royce-D-O/CPE301_Final)

