CPE 301, Section 1001 - Group 26

Final Project: Swamp Cooler

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Overview:

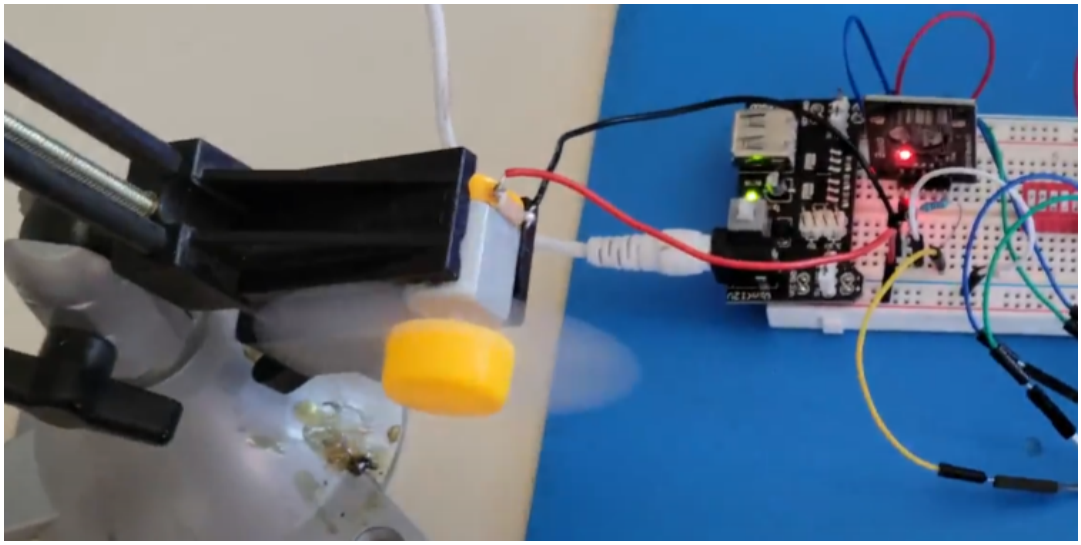
The purpose of this project was to make a swamp cooler using the parts included in "The Most Complete Starter Kit Mega 2560 Project". The parts used were: Arduino Mega 2560, water level detection sensor, LEDs, buttons, resistors, LCD module, servo motor, power supply module, stepper motor, stepper motor driver module, potentiometer, temperature and humidity module, RTC module, 9V1A adapter, usb cable, breadboard jumpers, and a breadboard. All the parts together form a bare bones swamp cooler that runs on four states, these states being disabled, idle, error and running. In the disabled state, the system waits for the push of a start button to turn on. Once turned on, the system will enter the idle state which will result in one of two outcomes. If the system has water it will go into the running state and will always check for the temperature to make sure it needs to be running. It will also check the water level and if it gets too low the system will enter the error state. In the error state, the system will turn off and prompt the user to refill the water before turning it back on.

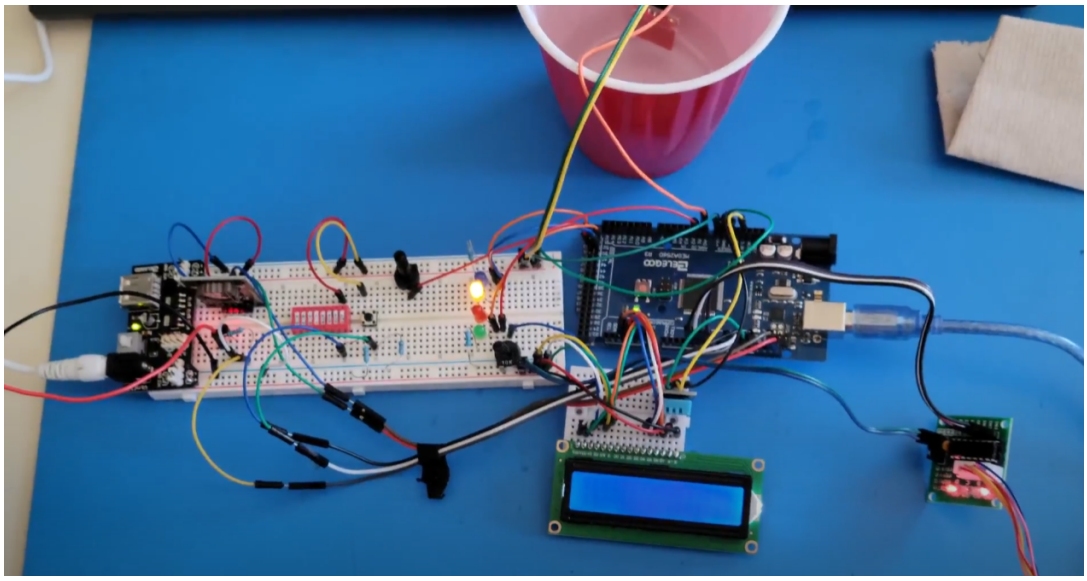
For this system, we used 25℃ as the threshold temperature. If the system goes above 25℃ it will remain in the running state. Once the temperature drops below 25℃ the system will return to the idle state and wait until the temperature threshold is exceeded. This allows for the system to only be running when it needs to be running. This is important because of some of the power restraints that we encountered during the design process. The main issue we encountered was that whenever the servo motor was running it would draw too much power and would turn the LCD display off in order to keep running the fan. We believe this was due to the servo requiring too much power to spin with the fan attachment on it because when the motor spun without the fan it worked as intended. Overall, the project worked as intended for the bare bones design we were going for. It was a working concept but would need some tweaking to make it work as a fully functioning swamp cooler.

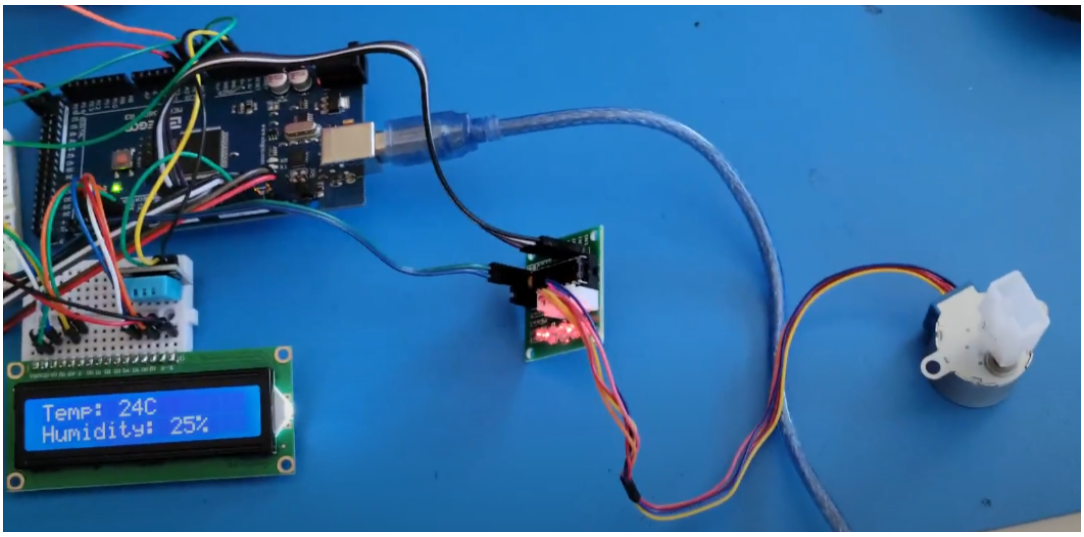
VIDEO LINK

GITHUB LINK

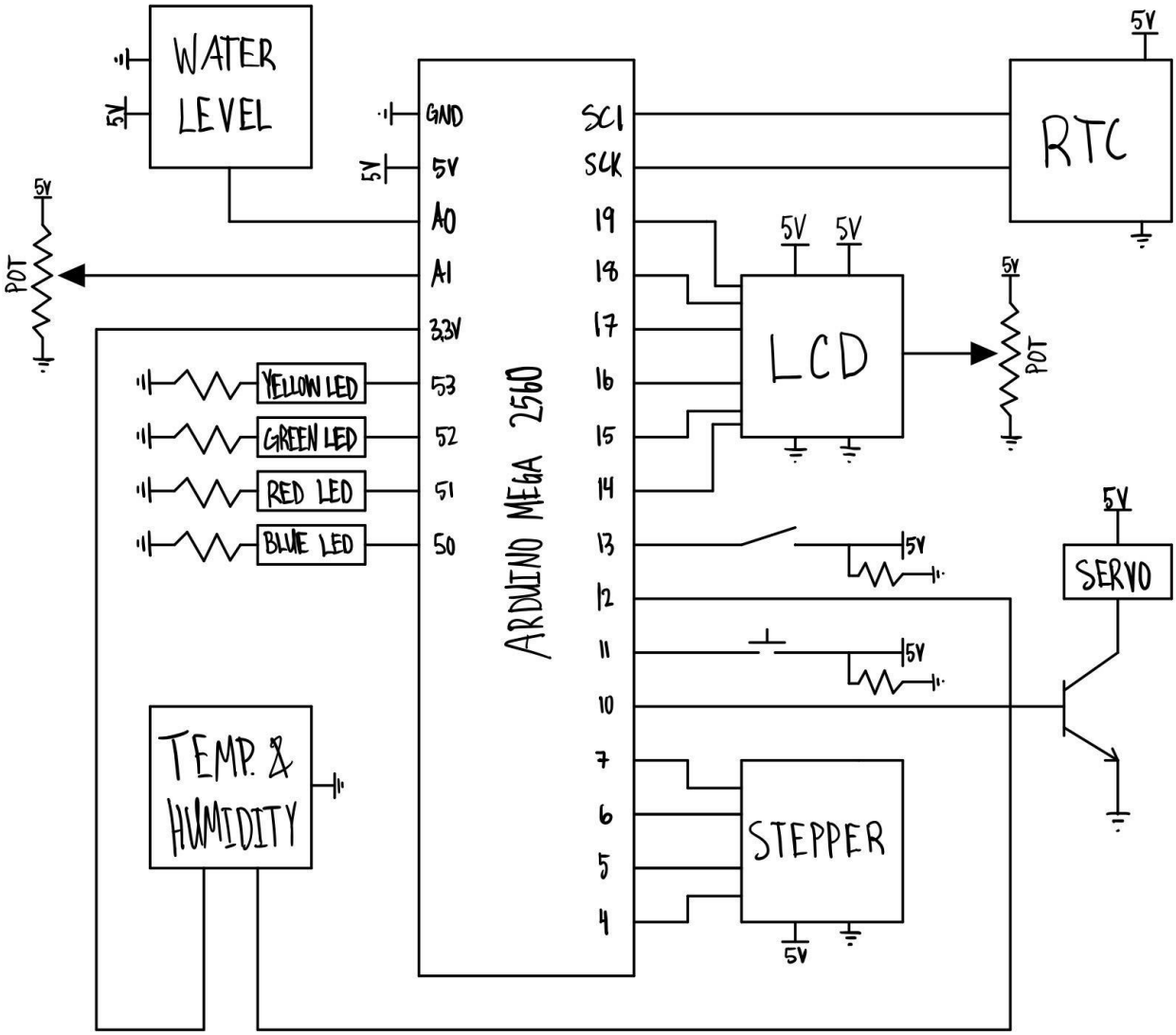
Pictures of Final System:







Design Schematic:



Specifications:

[Kit Link]
[Arduino Mega 2560]
[Water Level Sensor]
[Temperature and Humidity Sensor]
[LCD Module]
[Stepper Motor]
[Potentiometer]
[DS1307 RTC Module]
[LEDs]