# CPE 301L, Section #1104
# Final Project
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**Introduction:**
The goal of this project was to integrate the various techniques and hardware we have learned to work with throughout the semester into a functioning swamp cooler. In doing so we would use concepts such as ADC, GPIO, and UARTs. It would also require an LCD to display error messages, a stepper motor for vent control, an RTC module for time and date access, a water level sensor, DC motor, as well as a temperature and humidity sensor.

**Design and Constraints:**
Supplying adequate power for all the components without damaging them or the Arduino board was one of the most impactful constraints we had, and partially led to the use of multiple breadboards. The sheer number of components involved is another reason for the decision to use multiple breadboards, as the wiring quickly became very difficult to keep track of.

**Problems Encountered:**
In the process of figuring things out we struggled with the stepper motor as well as proper LCD control. After figuring those things out our major issue was with the temperature threshold. Due to either an unsolved error on our part or perhaps a problem with the device itself, the system doesn't behave appropriately once the threshold is reached. Everything else functions properly but when the temperature breaks the threshold some components of the system such as the LCD and LEDs seem to turn off instead. However, we know some functions of the code are still running, because even after this, the system will still correctly enter the error state if the water sensor is removed from the water. The problem seems to impact the system's ability to properly implement the running state, which indicates the issue is most likely somewhere in our code. The temperature threshold was a little finicky to find a good value, but it was easy to find an appropriate water threshold value.
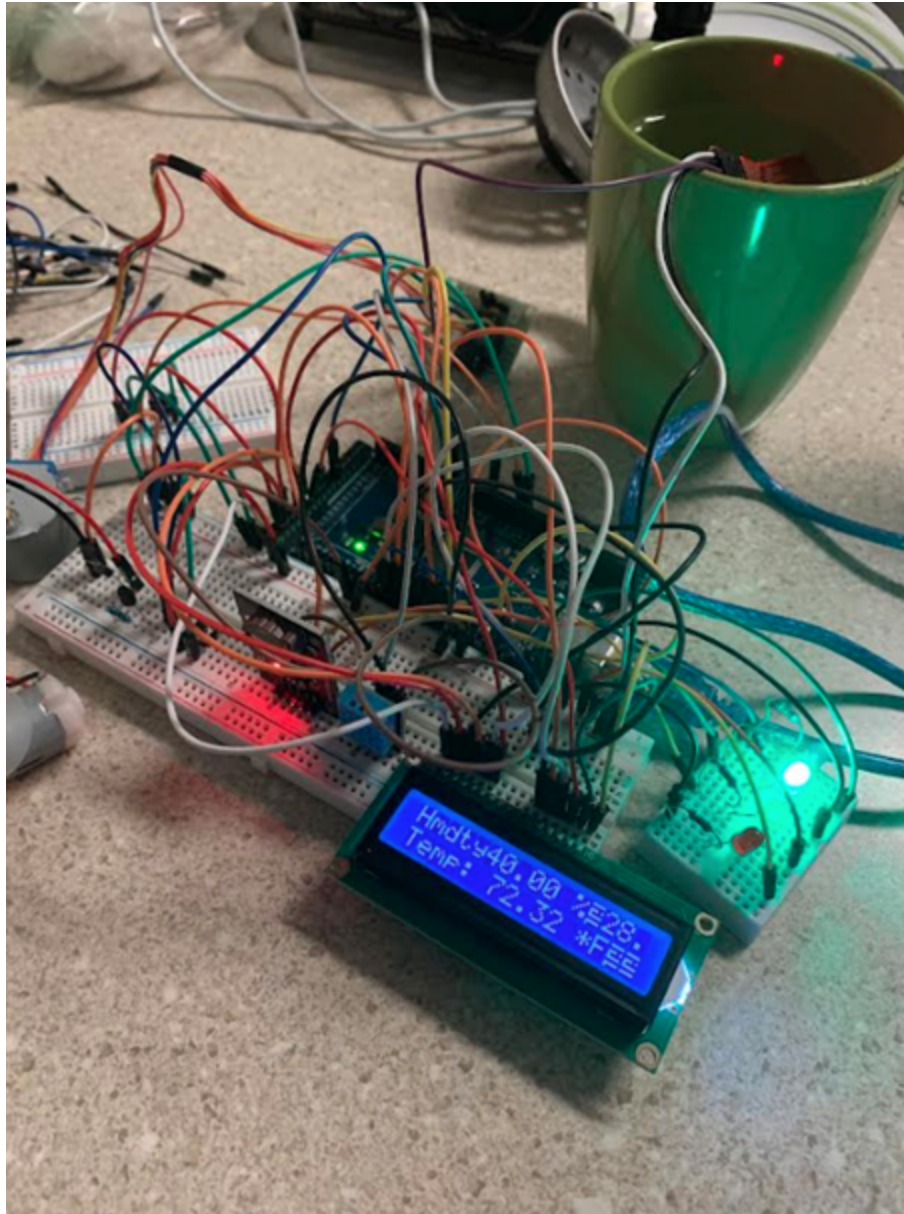
**Arduino Pinout Diagram**
**Github link**
**Video of operation**

**Pictures:**
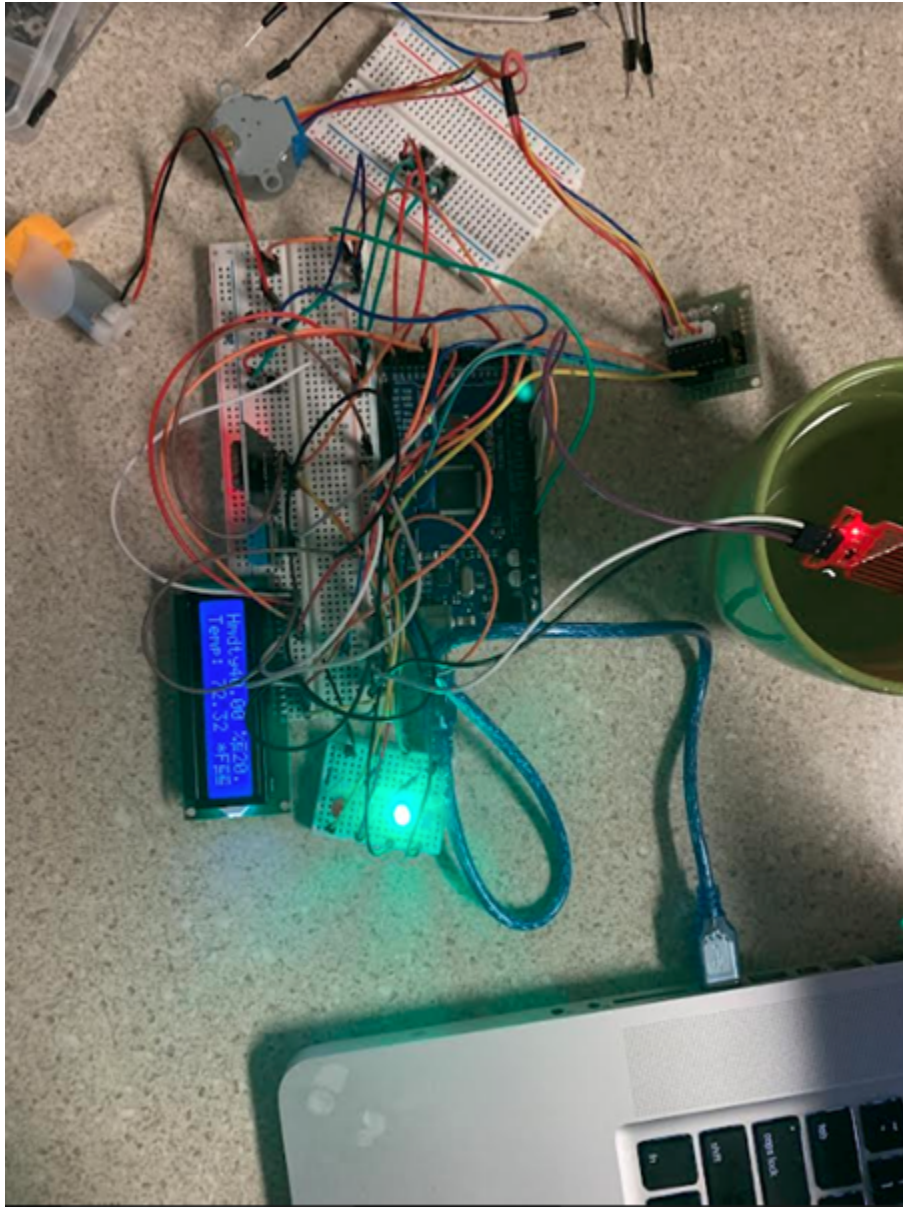


**Figure 1: Overhead View**

**Figure 2: Showing LCD Reading**