CPE 301 Final Project

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This project is designed to be a smart swamp cooler system that uses many different components to control the environment. The main components include:

**DHT11** sensor: a digital temperature and humidity sensor.

**LCD Screen**: a 16x2 screen that is used to display the temperature and humidity from the DHT11 and the proper error messages for certain scenarios. The liquid crystal library was used for this.

Servo Motor: this controls the angle of the output vent in the swamp cooler system. The user can control the angle using a 10k potentiometer.

Water level sensor: this is a module from the Arduino kit that detects water level. The upper threshold was set to 50, so when the water level drops below that, the system will go into error mode.

Fan Motor and LEDs: the fan motor is used when the temp gets above the threshold, which was set as 26.0 degrees Fahrenheit. Depending on the state of the system(DISABLED, RUNNING, IDLE, and ERROR), the fan will turn on or off and the proper LED turns on to indicate the state.

DS1307: this keeps the real time even when the power is shut off.

Operating Requirements:

The system continuously cycles through the four different states depending on the specified constraints. The water level should be continuously monitored and if the system detects that the level falls below 50, it will shut off. The temperature and humidity is also continuously monitored, and if the temperature goes above 26.0 degrees Celsius, the fan will be triggered. Also, the user can enable and disable the system using an on/off button, and the system will switch between idle and disabled. Last, the system will record the time and date using the DS1307. The information is transmitted to the serial monitor over usb to the computer running the code. This project also uses a Power source module that supplies 5V to the components.

