CPE 301

Final Project

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**Project Description**

The components used to build this project are LEDs, real time clock, temperature/humidity reader, fan, water sensor, motor, stepper motor driver, LCD screen, potentiometer, 9v battery, power supply module, and button. The states in this project are disabled, idle, error, and running. Disabled happens when the system is off, and nothing is running. Idle happens when the temperature reading of the room is lower than the given temperature causing the fan to not engage and the motor will rotate to the right. Error happens when the water level is too low and cannot cool the room causing the system to stop running and wait for a reset. Running happens when the temperature reading is higher than the given temperature, the fan is running, and the system must cool the room. The system monitor is updated each time there is a state change and displays it with the time and date.

**Component Description**

LEDs:

These are used to show the current state of the samp cooler. Yellow for disabled, red for error, blue for running, and green for idle. There is a fifth LED used, but its only purpose is to show that there is power being received from the battery into the board.

Real Time Clock:

This is used to show the time and date. When the circuit is running, and a state change happens, this component will send the current time and date to the serial monitor to be displayed.

Temperature/Humidity reader:

This is used to collect the rooms temperature and humidity. It then sends this data to the LCD to be displayed. This data updates every minute.

Fan:

The fan is controlled by the motor and will run when the system is in a running state. It is used to start the cooling process and bring down the temperature of the room eventually putting the system into an idle state.

Water sensor:

The water sensor is used to read the current water levels and make sure that the cooler doesn’t run when water levels are too low.

Motor:

The motor is connected to the fan and controlled by the right potentiometer. If the potentiometer is turned to the left and a state change happens the motor will turn on, rotate to the left and cause the fan to spin. If the potentiometer is turned to the right the motor will turn to the right and the fan will not spin.

Stepper Motor Driver:

This is used to help control the motor because the motor consumes a significant amount of power and cannot be controlled by a microcontroller like an Arduino.

LCD screen:

This screen is used to display the temperature, humidity and if the system is in disabled state or an error occurs, like water level to low.

9v Battery:

This is used to provide power to the board and components like the fan.

Power supply module:

This is used to regulate the power received by the battery and send it to the different components of the circuit like the fan.

Button:

This button is used to control the whole system when the system is powered it starts in the disabled state. After the button is pressed and for example the system is lower than the provided temperature this will send the system into an idle state. The button is also used to reset the system after an error occurs and bring it back to the disabled state.