Code Documentation

Firmware V0.1

This documentation provides an overview of the functionality and usage of the V0.1 firmware code.

# Description

The code defines and controls pins for LEDs and the heater. It initializes the pins, sets up the serial communication, and performs the necessary operations to control the LEDs and the heater.

# Pin Configuration

* VIN: The power input pin connected to the 9V batteries through a latching button.
* GND: The ground pin used as a common ground for components.
* **LED\_N\_**PIN (*Pin 9*): The pin connected to the LED for the North direction.
* LED\_E\_PIN (*Pin 8*): The pin connected to the LED for the East direction.
* LED\_S\_PIN (*Pin 7*): The pin connected to the LED for the South direction.
* LED\_W\_PIN (*Pin 6*): The pin connected to the LED for the West direction.
* HEATER (*Pin 5*): The pin connected to the heater.

A computer screen shot of a circuit board

Description automatically generated

Figure 1: Arduino Pro Micro Pinout

# Variables

shutoffTime: An integer variable representing the duration (in seconds) after which the heater should be turned off.

# Functions

void setup(): This function is called once when the program starts. It initializes the pin modes, starts the serial communication, and turns on the lights and heater.

void loop(): This function is called repeatedly after the setup() function. It checks the current time and turns off the heater if the shutoff time has elapsed.

void heatOn(): This function turns on the heater by setting the HEATER pin to HIGH and prints a status message over serial.

void heatOff(): This function turns off the heater by setting the HEATER pin to LOW and prints a status message over serial.

void lightOn(): This function turns on all the LEDs by setting the corresponding LED pins to HIGH and prints a status message over serial.

void lightOff(): This function turns off all the LEDs by setting the corresponding LED pins to LOW and prints a status message over serial.

# Usage

1. Connect the LEDs and the heater to their respective pins as specified in the code.
2. Upload the code to the microcontroller board.
3. Open the serial monitor with a baud rate of 9600 to view the status messages.
4. The lights and the heater will be turned on during the initialization process.
5. The heater will remain on until the shutoff time has elapsed.
6. After the shutoff time, the heater will be turned off.
7. The status messages will be printed on the serial monitor to indicate the status of the heater and lights.