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To control the temperature, I used Booleans to create different states. When you run the code it starts off in the idle state. During this state the code does not make any changes, hence being idle. The machine enters this state, breaks out, and then goes on to perform its other functions. The two other states are temperature increase and temperature decrease which can be entered through changes in their respective Booleans.

After the machine enters and exits its state it will display the temperature, setpoint, heat status, and seconds the clock has been running. This is displayed every second while every 200ms the program will check if a button has been pressed and every 500ms the temperature is checked. If a button is pressed then the program will enter into a different state depending on if the user wishes for the temperature to be increased or decreased. If increased, the Boolean for increasing temperature becomes true and the program enters into the increase temperature state. In this state setpoint is increased by 1, the Boolean once again becomes false setting the machine back to idle, and the machine moves onto checking temperature. If the decrease temperature occurs then the machine enters the decrease temperature state, decreases setpoint by one, and sets the Boolean back to false.

Every 500ms the temperature is checked. The temperature is checked through if statements. If the temperature is less than the setpoint then the heat turns on, and if it is more than the heat turns off. If the heat is turned on then heat turns to a “1” and the LED is turned on. If the heat is turned off then heat becomes “0” and the light is turned off. Finally, after another 500ms the program displays the temperature, setpoint, heat status, and timer in seconds. This display reflects the changes that have been made since the last display.