



## SF-4 Assignment

Create a home thermostat with a potentiometer, LEDs (choose: 2 LEDs (red and blue), or one RGB), a temperature sensor, and an LCD (optional, can be replace with serial monitor).



1. LCD/Serial monitor greets users with a welcome message.
  2. LCD/Serial Monitor displays the ambient temperature in deg.F in one line, and the set temperature (desired room temp) controlled by Pot on the next line. LCD refreshes every 5 seconds or less.
  3. When the ambient  $tem \leq (set\ temp - 1)$ , the **red LED** turns on and LCD/SM displays “**heater ON!**”
  4. When the ambient  $tem \geq (set\ temp + 1)$ , **blue LED** turns on and LCD/SM displays “**AC ON!**”
  5. Both LEDs cannot be on at the same time!
  6. When the temperature is within  $\pm 1\text{deg.F}$  of the set temperature, repeat step 2 and LEDs are OFF.
  7. Create two separate custom functions for the heater and the AC.
- Prepare an algorithm for the main script and your function.
  - You will need to use the codes provided to you from Sparkfun to create new code to run this program. All the attributes discussed above **MUST** function in one code file. Copy and Pasting from the Sparkfun code is acceptable for this assignment.
  - Use constant variables to store pin numbers, tempPin, potPin, etc.
  - Your name and email address should be in the first line.
  - Your code should have enough comments to help me understand:
    - What each line of your code does, and how the hardware is connected
  - Prepare a final wire diagram of the components used for this assignment using AutoDesk circuit!

### Submission:

1. Individually record a short video that shows steps 1~7. **Your Student ID** should be in the video.
2. Upload your algorithm, video, Arduino code, and a screen shot of the final wire diagram prepared with Autodesk circuit to Canvas through SF-4 Assignment Link by the due date.

### **RUBRIC**

items	Points
Upload one pdf (Syntax description table)	10
Student ID is shown in the video, Your code should have the followings: Name, Email, Comment every line of the code, explain hardware connection, constant variables	10
Algorithm(s) is clear and easy to follow	10
The wire diagram shown on the screen shot is correct for this assignment!	10



Arduino code complies with no error, Steps 1~7 clearly shown in the video and a welcome message is displayed.	10
LCD/SM displays the ambient Temperature and set temperature in Fahrenheit and refreshes often!	10
When ambient tem $\leq$ set temp-1 $\rightarrow$ red LED turns on and LCD displays heater on	10
When ambient tem $\geq$ set temp+1 $\rightarrow$ blue LED turns on and LCD displays AC on	10
When the temperature is within $\pm 1$ deg.F, displays step 2	10
Uses two custom functions for the heater and the AC	10
<b>Total</b>	<b>100</b>