Executive Summary
Sam Wagner
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Design Problem: Supposedly a hypothetical client would like to use a timer to hard boil his/her eggs. He/she wants to have two discrete options for 4 and 10 minutes and wants the timer to be accurate. The timer should be accurate within +/-1 second per minute and the display should have 3 discrete brightness levels. When the countdown is finished, the alarm should ring at 440 +/- 1 Hz. In addition the client wants an extra feature which is to add an extra minute in the middle of timing if he/she wants to extend their boiling time a little longer.

Development: I was the only one working on this project. The way I approached was to divide the system into blocks and tackle each block. I used a block diagram to split up the blocks. That was really helpful. I first tackled an easy block, just to start making progress. I chose to tackle dimming feature first. Then I focused on getting the central part of the system, which was the timer countdown, to work. This required coding a long script. When I got the countdown feature to work, I focused on integrating the other blocks into my design. The last step was to do the non-technical parts, such as designing an enclosure and building a mock version of one. I was able to finish the project this way.

Revisions: I was originally going to use USB power to power my timer. However, I began the development with my JD Power Supply which takes in wall power and steps it down to a usable value for the Arduino Nano. I eventually decided that I would abandon the USB power idea and stick with wall power. One improvement for the future I would want to make is to make the timer without the Arduino. The Arduino is a great tool, but it’s a little bit overkill. I’d like to design a chip specifically made for the timer and attach it to a PCB. That way I’d have less wires and more sturdy connections.

Key Lessons: One key lesson that I learned is to practice good time management. If you don’t spread your work out, you end up with a large pile of it at the end. This can be avoided by doing just a little bit everyday. It doesn’t have to be much, it can be just 30 minutes of staring at some code, trying to figure out why it doesn’t work. I learned that you should document your project along the way. Even though it’s kind of a hassle, it’s still better than doing it all in the final week.

Original Project Timeline:

This is my original timeline. Some things changed, but it is a good representation of the progress I made over the course of 8 weeks.