Execute summary

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# Technical Contributions

1. I was in charge of creating the backend. It took some time to figure out how the architecture of backend needed to be made. I knew that the dispenser needed to spin while the GUI would still allow for the user to navigate through the menus. This means that the program will need run many different threads. The device works based off of what the user controls on the GUI so I decided that doing an event-based backend would work the best. The GUI or frontend would call a function in the backend that would either run the process immediately or call the thread handler to start the task on another thread. To store data, I used an SQLite3 database. The reason for choosing to use a database was because I knew that we wanted to store load cards and other setting like data. These might need to be accessed by different threads so instead of trying to us shared memory or queues the database will already handle different threads trying to change the same memory location.
2. I worked with the configuration of the Beaglebone board and connecting the hardware to the board. The Beaglebone needed to have an operating system that had a graphics driver so that we could display the GUI. I also had to install the software dependencies and work on getting the code to run on the board. I also worked on getting all of the other boards connected to the prototype board so that we could run a demo since we were not able to get the board designed and manufactured this semester.

# Team Contributions

1. My first responsibility was to be the team leader. This means that I had to have the overall pictures of the software design and hardware design. I started by splitting my team up into sections that make sense for what each person. Our team composition was three computer engineers (Dale, Jonathan, and myself) and two electrical engineers (John and Colby). It made the most sense then to have Colby and John work on the hardware and Dale and Jonathan work on the frontend. I then helped direct them on their goals for the week and to make sure they did their tasks. To make sure that we were always on the same page I made sure that we would do standups once we had work time. Since we presented first, we did get to meet before the presentation however, this meant that when we did meet it was to talk about the sponsors feedback and what direction we need to go for the next week. I also had to make the presentation for each week for the group. I would review everyone’s slides to make sure there are not any spelling or grammar mistakes while with the sponsor.

# Final Report Contributions

1. I worked on filming the demo and running the demo during the presentation. This meant that I needed to get the code into a running state on the prototype board and to get the hardware all connected. If we had time to get the board made, then this would have just been connecting our designed board up to the screen and running it. So, this ended up differently than we would have wanted.
2. I also helped with the creation of the power point. Colby took the lead on general design of the document but had all of us fill in our sections that we are going to be presenting.
3. The documentation that I was in charge of was the software backend and the operating system configuration. The backend software documentation lays out the design and why it was chosen. It also talks about the direction that the next group should take in the software to move towards the final product. The configuration document lays out the steps that it takes to get a blank Beaglebone to running a demo. This s important just in case something happens where the board loses its state.

# Future work on project

1. I believe that the Beaglebone is not strong enough to run the GUI as smoothly as the sponsor want so I would look for another processor that is faster and has easy to access GPIO pins. When looking at picking one take care when looking at all the possible connections. There needs to be two USBs, display port, and GPIO. This is needed for all the functionality that is need for the board.
2. Finishing the rest of the features that the sponsor wants for the product. Namely the settings, load card data affecting speed of trickle, and a finished looking board. These should be able to be finished in a semester with the start that we were able to get.

# Week Breakdown

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| Week | Hours | Major Tasks |
| 1 | 13 | Read through given documentation and researched the product. |
| 2 | 13 | Started to write backend and created I/O list. |
| 3 | 12 | Testing the stepper driver by using PWM instead of system time. |
| 4 | 13 | Completed the stepper driver and started to work with database. |
| 5 | 13 | Investigated why the board blow up and finished database. |
| 6 | 14 | Started testing backend events on the new Beaglebone and trying out PID. |
| 7 | 12 | Created documentation format and continued to debug through backend code. |
| 8 | 16 | Debian configuration and started merging code bases. |
| 9 | 14 | Switched testing to raspberry pi and worked on GUI |
| 10 | 14 | Started working on demo and recreating lost code. |
| 11 | 13 | Downloaded LXDE onto Beaglebone and started working on running frontend on the board. |
| 12 | 13 | Linking the frontend and backend and building out the demo. |
| 13 | 14 | Writing documentation, finishing demo, and working out coding bugs. |
| Total | 164 |  |