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Culmination Updates
Progress Report 1
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During October, I focused my attention on learning how to use Cura to start printing my STL files from last month. Cura was another platform that took some time to learn how to navigate the software. With help from Rudy, I was able to bring any questions I had about how models should sit or how they should be supported and help me find the answers, to better optimize the parts I was printing. Before I start printing the parts to construct the case for the machine electronics, I use alternative files to calibrate the machines. The first picture is a bowl I made in Fusion 360 to see how the program would support a print of its size. That print took twenty-five hours to print (Photo of Bowl). And came out very clean. Sitting next to the bowl is the pile of supports that were removed to see better how much material can end up being wasted in the printing process. The second photo is of a clip with small parts. I wanted to see how the machine handles a file so small with a greater level of detail. While I was making my test print on the 3D printer in the third bay, my prints kept having issues, some minor, some greater. But after I started using the printer in the first bay my prints started coming out far better than when they were made on the third printer. (Photo of clips) So moving forward any final printed parts will be printed on the first machine. The first is a clearance test to get a gauge of what size my interlocking pieces need to be. (Photo of test sizes) Each piece is resized to be a little smaller, continuing to make them smaller. But not too small the part needs to be snug while also allowing it to slide in and out. The last update on modeling and printing is that I finished making the guide part of the device to help pull spool the thread, ensuring it is even and consistent in how it's rolled. Also in October the electronic parts finally came in the mail so I was able to start assembling them according to the schematic I had made. (pic of schematic).

The motor was the first thing I put together to see how the controller would work. I was excited with how well the setup went until the power supply I was using just went out as I was raising the speed of the motor. This was a nonissue as it was the result of a faulty power strip. The motor took maybe 30 - 45 minutes to set up, but then the heating controller. The list of problems was as follows, First, the instructions that came with the heating controller (HC) were not helpful in the slightest. There was a lot of confusion concerning how the HC would be powered since there was the option of using a single power source or two independent power supplies. After examining the schematics of the HC online I was able to figure out how to set it up using two different power supplies. This ended up being ideal as one of the power supplies had a direct connection to a wall outlet. While the second one can be better managed. Second some wires got crossed and fried the HC but fortunately, I had a spare but it became useless with the last problem which was that the controller couldn't maintain the set temperature I assigned it. This caused me to need to find a better part to properly maintain my desired temperature.