

Part A:

My individual contribution towards the project can be classified as the hardware portion. It worked out that our project could evenly split into 3 even parts: hardware, firmware, and software. The hardware portion consisted of researching what onboard computers/chips would be needed, what machinery/motors would be needed, how to power all of the components, and the physical connection/overall look of the project. So in realistic terms my contributions were researching all of those components and creating circuitry/design diagrams showing that it would be correct, acquiring many of the physical parts and assembling them (wiring and soldering them together), and 3D designing/printing/prototyping all of the required parts to assemble the final design.

I definitely have applied and built upon my skills mentioned last fall. My initial skills going into this were some very rudimentary projects working with bread boards and coding raspberry pi/arduinis. This project forced me to dive much more deeply into circuitry, powering methods, servos, 3d designing, and 3d printing. I have greatly expanded my skills in all of those areas to the point that I would be much more comfortable doing another larger project that needed all of the needs met. As discussed before I researched what type of microprocessor we would need. Due to the need to run a communication protocol over it, we decided a raspberry pi would be the best option. From there I needed to know how to connect a servo to it. I found we could use the standard GPIO pins on the pi, but that would require us to use a breadboard and messy wiring, which was insufficient for the final look we were going for on the project. I researched further and found that “servo hats” are made to plug into Raspberry pi and be easily configurable and we decided to go that route. The “pi hat” as they called it was shipped unassembled and had to be soldered together. In parallel to researching those board needs I found that the 5v power coming from the raspberry pi would be insufficient for powering the hat and servos we needed and found a power supply able to connect to the pi hat to fit our needs. From this point I researched many different servos/motors to find out what our options were. In the end I decided a typical 180 servo would be enough for our purposes, but went back and forth on this decision multiple times. Other than those things I designed all of the parts going into our project needed to be 3d printed which required many hours of prototyping in order to get a clean final look and feel. Pretty much everything from above was learned from scratch. My knowledge was very basic going into this project, so it was a large learning experience. Everything listed was a pretty large success. The main obstacles I had came with prototyping, as if a large print didn’t work that could mean making a small change and spending many more hours printing the new version of it.

Part B:

Our group accomplished the entire task we set out to accomplish from the beginning. I am proud of everyone for pulling their complete weight and making our final project a large success. I learned/was reassured that group work is most often successful when your partners are

able to be chosen and it is known that they are competent. I knew everyone in my group before this project, and it was much easier to stay on schedule and trust that the project would be completed on schedule when I was able to trust my group mates' work ethic and work quality.

I would say every aspect of our teamwork was successful. We worked well together and hit deadlines on time in the way that they were supposed to be done. One thing I would say we struggled with was leadership. At the beginning we had conflicting ideas every once in a while due to all of us throwing out ideas and not coming to a firm decision. Once we figured out our groove and decided to have one person follow the deadlines of the class and set our pace, it became more cohesive and easier to understand the individual steps of development. My efforts equal those of my teammates. As I said in my first paragraph our project was easily dividable into 3 equal parts: hardware, firmware, and software. Due to this, it was very easy to allocate work evenly and make sure everyone was able to contribute an equal portion to the project. I wouldn't say any one of us deserves special recognition solely because we all did well in contributing our parts. No one was lacking and we worked together efficiently.