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CS35 Final Project Reflection

The real-world applications of Python are what made CS35 interesting to us. We wanted to use what we learned and incorporate some sort of hardware for our final project. Initially, the idea of a robot sounded very appealing to us, and so we brainstormed with the idea of a robot in mind. Then, Prof. Dodds brought out a couple of interesting devices to show the class. There were things such as mini drones, some sort of robot sphere, and a headset that tracked your brains electrical activity. Right when we saw the Mindwave, we decided that it would be cool to do a project on that. We started to brainstorm ideas about how to best use the Mindwave, and we came up with the idea of using it to track your attention levels to help develop better study habits.

Right off the bat we realized that just getting the Mindwave to connect to our computers was going to be a big headache. At first, we tried with Kenny’s computer, a mac, and then we tried with Jason’s computer, a PC. Kenny’s computer would not work no matter what we did so we tried Jason’s. The documentation and instructions on the Mindwave website were not very helpful. It didn’t exactly tell us how to connect the Mindwave to a computer. After messing around with the Mindwave, we realized that we needed a dongle to even get it connected. After we got the dongle, we were able to connect the mindwave, although we still ran into some trouble because the setup for it was not user friendly at all. After playing around with the Mindwave and the games that were available to us through the website, we got a good idea of the Mindwaves capabilities. To be honest, the connection was horrible and sometimes it worked, and sometimes it didn’t. But, we still liked our idea, so we stuck with it.

The next step was to write the code for what we set out to do. We wanted to have the Mindwave make a graph of the data that was collected, so we looked for some libraries that could help us. By far the most useful library we found was Neuropy. It was basically the documentation of the Mindwave available on the website (which was in C#), put into Python. This was incredibly helpful, since we did not know any C#. We were also able to make a graph of the data that we got from the Mindwave. There were limitations to this however. We had to manually enter the data we got into the program to make the graph, which was not very helpful and was very time consuming. The next step was to have the Mindwave transmit data to our computer, and then having it directly make a graph. This was our main goal in this assignment, and we were thrilled that we got the code to work. However, then came a problem. The mindwave was not connecting to Jason’s computer anymore. We had downloaded an app from the MIndwave website that allowed us to see if the Mindwave was connected for disconnected to the computer, and it was only reading disconnected, and the red light would be on continuously, no the blue, which showed that the mindwave was connected. We had already gone far with our project at this point, and with other things coming up, we figured we should just stick with our initial plan, and hopefully figure out the problem with the Mindwave at a different time. Using this data that we got, we then set out to analyze it to see if the specific types of music helped with studying. The higher numbers we got from the Mindwave data meant that there were higher levels. These higher levels meant that they reacted better to this type of music, which meant that this specific genre of music is what they should be listening to when studying. If we had to do this again from the start, the main thing that we would do differently is to 100% make sure that the headset works, and that there were no connection issues, since that was what gave us the most problem. Something else we could have done differently is to email the Mindwave developers and try to get some more documentation and guidance from them. By doing this it may have saved us a good deal of time from researching the mindwave and trying to figure out its lackluster documentation by ourselves.

If we had more time, we believe that we could improve our program considerably. What we had the most trouble with was connecting the headset with the computer. Although we did get it to work and were able to play games with it, it just stopped connecting when we tried another day. We believe that this is a problem with the Mindwaves hardware, since it is an older headset, unlike the newer Mindwave Mobile. Also, we set out to try and make the data work seamlessly with Apple Music or Spotify to directly play a song, but that was not possible since their API was written in JavaScript. We were not able to put as much time into this project as we wished to do so, since SAT and AP testing took time away from regular school work and this project, but overall, we are satisfied with what were able to accomplish. Through this project, we learned to use libraries that we have not learned before, such as the NeuroPy library. Another thing we learned from this project was how to connect a piece of hardware and use it with code that we had written ourselves, which was awesome.