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ISAT 252
Dr. Morgan Benton
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Semester Narrative

I'm a 4th year, but having changed my major 4 times and taken a gap semester, this being only my second year in the ISAT major. I took ISAT 252 in the past with Salib, but withdrew from the class rather quickly, as his teaching style and mine did not match up. This is my first coding class since highschool, and it was surprisingly enlightening.

Coming into this class, I expected a Coding Academy style teaching method, starting at the basics and working up to more complex functions with periodic assignments for progress assessment. I was also expecting an in-person class, though I'm glad it wasn't, since my previous experience with an in-person coding class went suboptimally. Also, my primary computer is a big 35lb desktop, so I'm glad that I was able to use that for coding rather than my hamster wheel powered laptop.

In terms of learning goals, I wanted to take this unstructured opportunity to learn the concepts behind coding, rather than focusing exclusively on the technical skills. I set the goal of creating a velocity calculator, which I created and uploaded to github. In researching how the code behind the scenes for a calculator works, I happened upon strings. I made an understanding of strings my next task, which I used Coding Academy and general googling to acquire. I then looked into an automatic transmission gear shift algorithm/program, and looked at a few bicycle gearshift programs I found on github. I quickly realized this task was going to be insanely advanced and difficult, and chose to move onto something I'd get more value from— in this case, looking at APIs. I did a bunch of conceptual research, and delivered a verbal description to Dr. Benton on the concept of APIs. During this time, I was working on a temperature sensor for a different class that involved using a thermocouple to detect the temperature of a sample of water, then having the RPi send a message to my phone, alerting me to the temperature. This served as some practice with a messaging API, and I got it to work. A friend of mine is a CS major at Stevens Institute of Technology, and walked me through the process for creating Discord commands. Using a bot hosted on his personal server, we made the bot send a call to a messaging API that sends a text to our friends' phones telling them it's time to play video games if a certain command is typed into the bot chat on our discord server.

In terms of what I did to carry out this class, I did a lot of reading, and tried to build an understanding of generally how code works. I looked at Code Academy, Khan Academy, my ISAT 300 manuals, and talked to my friend, the CS major. I would say it went over well, since I now find myself pondering what the code is for certain devices. For instance, the windshield wipers in my car. I have several settings for what speed I

want them to activate at. The first few settings alter the sleep time between activations. My coding knowledge tells me that's a loop, with the reverse command for the motor activating once the wipers reach the end of their arc. This is being run over and over again with a sleep time in between runs. My second to last setting runs the wipers continuously, but at the same velocity as the prior settings. However, my final setting runs the wiper continuously, but at a greater velocity. This tells me that the knob I'm turning is connected to an ADC that increases the speed of the motor/stator that turns the wipers. I spent a lot of time collecting data on what speeds/rpms/throttle depression resulted in gear changes, but ended up scrapping that project for the reasons previously stated.

This class likely occupied about 6-7 hours of my time a week, whether that be reading articles, watching and mimicking tutorials, or contemplating the code behind everyday processes.

In the beginning of this semester, I was intent on learning basic tools, since I had a very minuscule understanding of how to code. As I went on, I realized I'd be better off building that understanding under a teacher of whom I could ask questions, so I switched to the more conceptual aspect of things, as I have no difficulty teaching myself concepts.

I feel like I was successful in learning rudimentary mathematical coding, as well as the formation of lists. I believe I was successful on the more meta cognitive side, because this class changed my way of thinking. I'm honestly plagued with the curiosity of what sequence of steps results in the responses we see everyday in our interaction with technology.

I failed at creating a gearshift simulation. The breadth of the project got very big, very quickly, and I was discouraged from pursuing a project I thought unlikely to ever come to fruition. My understanding of APIs is still building, so I wouldn't consider that a failure OR a success.

My failures told me that I'm a novice. And this is true. This was my first coding class, so my ambitions got ahead of my skill level by a bit. To get closer to my goals, I will likely now have to continue to build my technical skills, which are definitely lacking. I will improve these skills as needed, whether that be for a class or for a job. As I just got hired as an intern at Merck in the production systems department, these skills may be needed sooner than later.

JMU's mission statement is to "produce educated and enlightened citizens who lead meaningful and productive lives." I feel as if this has rung true for me, this semester. My way of thinking has changed, as i stated above, now that I look at everyday devices and find myself wondering about the inner workings. I absolutely feel more functional/productive, as I've used my knowledge to generate actual devices and tools, such as the thermocouple sensor readout alert, and the discord bot that my friends and I now use. Unrelated to the class but still relevant to the mission statement, I

am now the Vice President of Theta Tau Professional Engineering Fraternity and the President of Fitness Club, with 150 members. I'm starting a TA job next year, as well as working part time at Merck during the school year, after the stint of full time work over the summer.

My struggles in ISAT 351 taught me that I value structure, consistency, communication, and fairness. My tribulations in ISAT 290 taught me that I still have room to improve my work ethic, as unexpected problems often arise, which require a certain amount of time to remedy; time you don't have when you wait too long to begin. ISAT 300 taught me the importance of note taking. This semester has tested my desire to work in pharmaceuticals, because of the battle that was ISAT 351, but it still persists. ISAT 300 revealed that I don't want to work anywhere near statistical analysis, because the presence of uncertainty and tolerance ranges makes it nearly impossible to draw any undeniably true conclusions, which is simply not how my mental model is built.

In terms of my scoring to the registrar, I believe that my performance and conduct in class was without flaw. I had perfect attendance, I showed enthusiasm, courtesy, participation, and brought in outside material to bolster the learning experience(in such cases as discussing voltages for CPU fans or the conversation about raspberry pi's). Additionally, I was not complacent to set low goals and just meet them as expected. I started with a simple goal for someone as novice as I, learning basic mathematical operations. Once I hit that goal, I jacked up the difficulty to a velocity calculator, which I also hit. It was only once I'd given myself a tremendously difficult task that I had to retreat, and not for lack of trying. In a class where your grade is determined by your effort, ambition, and conduct, I believe I performed at an A level.

All in all, this class was a welcome change of pace when set amongst my other classes. I got to learn at my own speed, build my own goals, and hold myself accountable for the time investment. It's been a pleasure!