Maps + Programming = Confusion

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This course began with the exciting idea of being able to work on a useful project for once. I was tasked with recreating the college's interactive map that helps other students find their way to different classrooms. The idea seemed simple, but I had no idea how complicated it would become in the coming weeks. The goal was to create an interactive map that could work from any point in the main building and direct students to another room in the building.

The interactive map would be run on a computer that is just a little bit bigger than a standard USB flash drive. It would be powered through a micro-USB port, accessing system files through a USB 3.0 port for faster speeds, and displayed through its HDMI port that would be hooked up to a TV. The magic behind it all was another USB device that essentially turned the television into a touchscreen television. Without this handle little device, students would have to use a computer mouse. On the software side of things, the computer would be running Windows 10 and the program to be written.

My approach to this project seemed to be to display the school map with some fancy formatting around the edges or on the side for other functions. Immediately, I thought that some sort of web app would be perfect for this and everything visually would be in HTML. Everything on the back end of the app would ideally be written in Python as it is the language that I know

best. Little did I know that by the end of this project, I would learn more about JavaScript than I thought I would have. If I had known that a good majority of this project was JavaScript, I would have programmed it in NodeJS instead of Python. I originally thought that a simple interface using Python's Tkinter library would be a good fit for the project, but I quickly ran into issues with that. After searching around, I found another library, Eel, that would aid me in the development of this project. Eel is almost like NodeJS' Electron library. Eel also translates Python code into JavaScript so it can be used within an HTML page. I figured that I would use Python more than I did, but as it turns out, I only used it for accessing the database and running the app.

As soon as I got the keypad, function buttons, and the design of the page done, I had to move on to the database that would hold the information for each course if the student entered a CRN instead of a room number. The database originally scraped web data from the student information system, which took more time than it should have. This method of getting the course information would eventually fail. I did not consider how often the student information system's website changed. I thought that the website would remain the same. I later scrapped the idea of scraping the web for course data. Peter LaMonica pointed me in the direction of using the CSV files that were sent to him. Peter told me to write a program that could take the data from that CSV file and insert it into the database. After the original, web-scraped database was created, I began my work on the map. I figured that a cool way of having the map work from any starting point would be to have some JavaScript code run that draws a line over the hallways until it reaches the room that the student is trying to get to. I did not want to resort to images or GIFs to show the student where to go because I felt I could do a lot better than that.

This is where everything became a lot more difficult and everything fell apart. I could not figure out how to get the lines to guide the student to stay within the hallways. The line would work for the first couple of turns around a corner, but then would cut through the walls of the building and go straight to the starting point. People cannot go through walls like that. Humor aside, the semester was coming to an end and I was very behind on my project. I had to make a choice; keep trying and possibly fail or pivot. I chose to pivot and chose to use image files. The major difference between my project and last year's project is that my project uses only image files and last year's uses GIFs. I tried using GIFs, but when I compiled the program into an executable, the file size was too large. I then figured out a more memory-efficient way of doing things with animating the pictures. I used CSS transitions to do this. This cut the file size in half. Those GIF files really did take up a lot of space. I did not use much from previous classes. The only classes I remember taking are "Data Structures and Algorithms" and "Database Design." The database used in the "Database Design" class was SQL. In my project, I used SQLite because it was portable, and I would not have to set up SQL on that slow computer. All you need for SQLite is the Python library. Everything that I learned and used was from the Internet. I used multiple online sources. Most of it was Stack Overflow.

My goal for this project was not to have low file sizes, fast loading times, or to have everything work perfectly, but rather to have a functioning project. I can at least say that it is functional. It would have been amazing and would have impressed more people if the pathfinding worked out with the JavaScript code. I spent a lot more time than I should have trying to get that one part to work. Some improvements to aim for were to make the map clearer and easier to read, have paths to every room, and reduce the keypad lag. I believe that I have accomplished all of these. In addition to the project, I wrote a guide on how to update or upgrade

the map so it can accommodate new rooms being added and a feature that Peter suggested in the last weeks of the semester.

If I had to do some things differently, I would have made sure that communication was a number one priority. I believe that my work suffered as a result of me not communicating properly. Communication has always been a weak point when working away from other people or the rest of the team. I would have also not wasted as much time on the JavaScript pathfinding and gone straight to using images with transitions. If I did this instead, I would have had a lot more time for user feedback and there would be a lot less stress on everyone. I feel that I have let myself down and my professors down by how poorly I managed my time spent on the project.

Works Cited

There were no papers or books used as sources.