

Karina Jacuinde

CS 499 Computer Science Capstone

Instructor Joseph Martinez

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Milestone 2 Narrative

The artifact I chose is the course catalog program that I originally created about three months ago for my CS300 Data Structures class at SNHU. The original version was written in C++ and included a Binary Search Tree to organize course information and allow users to look up courses and their prerequisites.

I chose this artifact for my ePortfolio because it was the right size and complexity to enhance within the capstone standards. It gave me the opportunity to show my growth while still being manageable to enhance within the timelines of this course. Rebuilding the program in Python also allowed me to demonstrate my ability to understand existing code, translate it into a new language, and restructure it in a cleaner, more readable way. The improved version is now separated into three simple files, includes cleaner comments, and has a README for easy setup. Python also made the code easier to write and understand. Its built-in string functions are very simple to use, so I did not need to use custom helper methods like I did in C++. This helped me keep the program cleaner. Below is an example of one of the built in Python functions used that eliminated the need to create our own functions.

```
if prereq_text:
    prereqs = [p.strip().upper() for p in prereq_text.split(",")]
```

This enhancement has helped me meet the course outcomes that I wanted to focus on in this milestone. I've demonstrated my ability to design and evaluate computing solutions

using an efficient data structure, in this case, a Binary Search Tree, and I applied software engineering practices by reorganizing the program into separate modules and improving documentation. The process has also strengthened my communication skills by requiring me to explain my decisions in my README, and this narrative. This experience has also supported collaborative and professional readiness outcomes, as the structure and clarity of this new version of the program is easier for others to follow and modify.

Enhancing this artifact has helped me refresh and strengthen my Python skills, since Python wasn't used much in my SNHU coursework. I taught myself basic computer coding using online resources and Python before enrolling at SNHU. Planning how to split the program into separate files, deciding what to put in which file, and keeping everything consistent, made a big difference in how organized the final project looks so far. My main challenge was translating C++ logic, especially the overall tree structure, into clean Python code while keeping the program behavior the same. Breaking the project into small, understandable steps helped me stay confident. I started with my main.py, followed by my models.py, and finally data.py, then I went back and made adjustments as needed in each file once I added the CSV file to my project. Overall, the enhanced version reads better so far, it looks more organized and shows how much I've grown during my time in the Computer Science program.