Southern New Hampshire University

CS-499 Computer Science Capstone

Professor Brooke

Project Milestone Three

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1. Briefly describe the artifact. What is it? When was it created?

The artifact I’ve enhanced for this module is a project completed in course IT-145: Foundations in Application Development created around April 2019. The goal of the project was to create a system for users to authenticate themselves and gain access to the appropriate file they were authorized to access. The program was written in Java and included two classes: an Authentication.java class that contained the main function and primary program logic; and a ValidateCredentials.java file that handled the encryption and validation of users and it also accessed and output the contents of the file the user was authorized to access.

1. Justify the inclusion of the artifact in your ePortfolio. Why did you select this item? What specific components of the artifact showcase your skills and abilities in algorithms and data structure? How was the artifact improved?

I selected this artifact to include in my ePortfolio because this was an early example of my skills as a developer. I was quite new to software development and I felt as though it could use updating to remind myself how far i’ve come and to demonstrate to future employers the skills I gained by presenting them a polished artifact. This project also used an MD5 encryption when validating user credentials. I felt as I could update this with a better encryption algorithm. To do this, I created a new class that handled the encryption in it’s entirety and contained a method to return the output to the program with which it compares to the stored value. I also opted to create a new class that handles the accessing of the file the user is authorized to handle. I will admit this portion of the artifact does need some improvement, but with the the other changes that are expected to this artifact for the next milestone, I believe it should be much more polished when complete. The logic for the main function was also not functioning properly so I rewrote some of that logic so the program is fully functional. I also updated some of the comments and added comments to the new classes.

1. Did you meet the course objectives you planned to meet with this enhancement in Module One? Do you have any updates to your outcome-coverage plans?

With this artifact enhancement, I did meet the course objectives I planned to meet in my Enhancement Plan and in fact exceeded those. This artifact meets two course objectives: proficiency in data structures/algorithms, proficiency in software engineering/design (soon to be databases as well), and lastly employs secure coding practices. The proficiency in software engineering and design and proficiency in data structures and algorithms is demonstrated in my added class and objects to support the increased security that comes with implementing an XOR encryption cypher. It is also demonstrated in creating the new class, FileAccess.java that increases the reusability and modularity of the program that allows for reading of files. In addition, the security mindset outcome is met with the more secure XOR encryption that the program was upgraded with. This will further be extended in the following milestone when the program is extended to use databases instead of plain text files to store user data. Instead of storing passwords in plain text which is not secure, the system will never store user passwords as plain text and instead stores the hashed passwords in the database without the key.

1. Reflect on the process of enhancing and/or modifying the artifact. What did you learn as you were creating it and improving it? What challenges did you face?

As I was enhancing this artifact, I observed just how much I have progressed as a software developer. Much of this was not functioning well or repeated code was used so I had to go in and address these problems before I actually added the enhancements I needed. It also surprised me just how easily I recognized these flaws that I didn’t see when I first wrote this. I didn’t really face many challenges with this but it did take me some time to try to modify this program to use the updated encryption algorithm as I had not worked with Java in some time and needed a refresher on some of the syntax. Having said that I really enjoyed updating this old project as I feel as though I can add so much to it to improve it that I had to reign in my excitement and focus on the goals I planned with this enhancement.