**Eportfolio Selection And Refinement Plan**

Anderson Forestal

Science department, Computer Science

CS-499-T4250 Computer Science Capstone

Southern New Hampshire University

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Selection and refinement plan

This assignment is an initial plan to follow through with the ePortfolio and demonstrate my skills in three categories within computer science: software design/engineering, algorithms and data structures, and Databases. This plan is a way to start a discussion and propose enhancements to refine the three categories of artifacts.

For this assignment, I plan to choose three artifacts that demonstrate my growth in the areas of software design/engineering, algorithms and data structures, and databases. These chosen artifacts are projects from previous courses work in the Computer Science program, in which I will enhance the artifacts to improve their quality, address their limitations or inconsistencies, and mitigate vulnerabilities.

**Software Design and Engineering**

Artifact: Basic List View Control

Source: CS145 Introduction to Java

Refinement plan:

When delivering the final project, I will ensure the application work as expected by ensuring all functionalities and requirements are met, according to the Basic List View control expectation. Moreover, I will enhance the capability of the application by giving users the limited ability to add, edit, and update pictures to improve user experience. Since file uploads are an essential feature of Basic List View Control, I will ensure inappropriate photos can be uploaded to the list and apply coding standards to prevent potential risks and vulnerabilities.

Skills:

By enhancing the Basic List View Control, I demonstrate my ability to code securely by adding features like adding, editing, and updating pictures from the list. Moreover, this assignment illustrates my knowledge, skills, and experience gained throughout the program, the ability to code in Java, and the ability to add functionalities according to requirements.

Outcome:

[CS-499-04] Demonstrate an ability to use well-founded and innovative techniques, skills, and tools in computing practices to implement computer solutions that deliver value and accomplish industry-specific goals.

[CS-499-05] Develop a security mindset that anticipates adversarial exploits in software architecture and designs to expose potential vulnerabilities, mitigate design flaws, and ensure privacy and enhanced security of data and resources.

Pseudocode:

1. Add the ability to update the list view.
2. Add the ability to add text and icons.
3. Improve code functionality to update and add icons.

**algorithms and data structures**

Artifact: Binary Search Tree

Source: CS260 Data Structure and Algorithm

Refinement plan:

I plan to use a well-written algorithm to solve complex problems. With that said, I use a modular and reusable algorithm and data structures to access data efficiently so that I do not have to create a solution to a problem that already has a methodical solution to a given task. Instead, I implement the algorithm to complete specific tasks that may or may not be like the original algorithm but supersede similar instructions. Therefore, I ensure that I use the most efficient algorithm that provides the solution in less time and consumes less memory in comparison to other algorithmic solutions.

Skills:

Demonstrate a thorough understanding of C++ data structure and algorithms to build efficient programs and implement data structures using algorithmic techniques to solve various computational problems. Enhancing the application with the most efficient algorithm will demonstrate my understanding of the algorithm's logic and relation with data structures to integrate essential object-oriented programming elements effectively. As can be noticed, introducing a binary search tree implementation is a highly effective algorithm as it reduces time by half. Although a binary tree algorithm can be complex, a BST is a practical form of ordered property that searches a tree from the smallest to the largest node.

Outcomes:

[CS-499-03] Design and evaluate computing solutions that solve a given problem using algorithmic principles and computer science practices and standards appropriate to its solution while managing the trade-offs involved in design choices.

[CS-499-04] Demonstrate an ability to use well-founded and innovative techniques, skills, and tools in computing practices to implement computer solutions that deliver value and accomplish industry-specific goals.

Pseudocode:

1. Define structures to implement the binary search tree.
2. Revise the documentation to implement the functionality.
3. Implement logic to free storage when the class is destroyed.

1. Implement logic to calculate a binary search tree value.

**Databases**

Artifact: Salvare Search for Rescue App

Source: CS340 Client/Server Development

Refinement plan:

To complete the required functionality for this project, I create a full stack development application using python language, Jupiter notebook platform, and MongoDB for users to access the Mongo database. In doing so, Pymongo imports MongoClient to allow the mongo database to interact with the dashboard. Moreover, I ensure the application has a user-friendly client-facing web application dashboard that integrates the dash core components to facilitate access to many interactive components.

Skills:

Demonstrate my understanding of Python language and the integration of the MongoDB database through the implementation of Pymongo and MongoClient to allow the mongo database to interact with the dashboard. Demonstrate the ability to implement a dashing table that provides access to large datasets. Ultimately, set up the database to import the datasets from a CSV file and demonstrate CRUD database functionality. Moreover, I use a dashboard to clue the frameworks to facilitate interaction between mongo and python. For the client-facing web application to interact with MongoClient, several component libraries import to allow communication among the frameworks.

Outcomes:

[CS-499-03] Design and evaluate computing solutions that solve a given problem using algorithmic principles and computer science practices and standards appropriate to its solution, while managing the trade-offs involved in design choices.

[CS-499-04] Demonstrate an ability to use well-founded and innovative techniques, skills, and tools in computing practices to implement computer solutions that deliver value and accomplish industry-specific goals.

Pseudocode:

1. Implement logic for location accuracy.
2. Revise the code to ensure requirement functionalities are met.

**ePortfolio Overall**

In the context of a reviewer, code reviews are an effective approach for the reviewer to communicate issues that need to be addressed before integrating them into the baseline. However, to prevent poor coding from polluting the main codebase, the software development process must be revised, and all due diligence performed to reduce security risks and not leave security to the end of the software development life cycle. As a reviewer, my comment will inform what line of code needs more work or suggests a different technique to accomplish the goal.

Generally, code reviews are an excellent approach to discovering bugs from modifying branches. This approach helps me to engage and deliver the best quality codes that adhere to code best practices. However, no matter how effective I am, there will always be room for mistakes. To address these mistakes, I must understand comments are a technical way to help me to grow and make better coding decisions rather than hinder me. When reviewing codes, it is extremely important to write clear comments that address specific issues to avoid misleading the development-based team on a wild goose chase. This way, the team can easily pinpoint the problem and implement a fix that adheres to the team's standard.

Through the narratives, I will illustrate the knowledge, skills, and experience I gain through project practices to develop an application that adheres to the coding best practices. Moreover, I will apply effective data structures and algorithms to elaborate well-written computer programs with the most efficient algorithm that provides a solution in less time and consumes less memory to solve real-world problems. After each iteration or implementation, the source code must undergo a series of tests to ensure that the test design gives confidence that the application meets requirements and functions according to specifications. The objectives of various stages of testing are an activity used to reduce risk and improve quality by finding and eliminating defects that may introduce in the documentation.

In the professional self-assessment area, I will illustrate my background to give an overview of what I accomplished through the SNHU Computer Science Program. Furthermore, I will demonstrate the skills and concepts learned in various languages such as Java, C++, MongoDB, SQL, Jupiter, and python IDE to develop software by applying coding standards to eliminate security risks and vulnerabilities.

As previously mentioned, I do not have any professional experience in the computer Science field yet. But I am looking forward to taking on a task where I can build upon my skills and increase my level of experience with the help of knowledgeable developers who have years of experience in the field. With that said, I am enthusiastic about technology and innovation; and I am ready to bring the skills I have learned from the program to an organization that will help me grow professionally and strengthen my development skills to the next level. Moreover, I am a responsible person with strong analytical skills to support the company’s business objectives with strong work responsibility.

References

Southern New Hampshire. “CS-499 Introduction: portfolios, Supporting Tools, and Keeping Pace” Mar 05.2023.

https://learn.snhu.edu/d2l/le/content/1276531/viewContent/23138151/View