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CS499

Narrative for ContactService.java

Artifact Two

This artifact is ContactService.java, which comes from CS320. The purpose of this code is to store contacts using a data structure and to be able to add, delete, retrieve, and update contacts. This artifact was originally created in January of 2024. This program is coded in the java language. This program consists of four classes, the two classes Contact.java and ContactService.java work together to add, delete, retrieve, and update contacts. The other two classes ContactTest.java and ContactServiceTest.java are test classes to run JUnit tests to verify the other two classes work as intended.

I selected this artifact to be included in my ePortfolio because it was a perfect example of a program using a data structure. I noticed it was currently using an array list, and I knew that I could enhance the code by replacing it with a HashMap data structure. HashMap data structures have a better runtime than array lists and they also are better for larger amounts of data. Considering the data structure is used to store contacts, we are unsure how many contacts would be stored. I believe it is best to assume a large number of contacts would be stored. This results in a HashMap data structure being a better fit for this program to store contacts.

The specific components in the artifact that showcase my skills and abilities in algorithms and data structures is the replacement of a data structure with a better suited one. The enhancements improved the artifact as it made it more advanced with a better data structure. We can see in the JUnit test that the program preformed quicker with a HashMap than with an array list. The enhancement made the program run quicker. Some specific skills I demonstrated in my enhancement was mastering data structures within a code by replacing the data structure that is used to a more efficient one, making the artifact perform better and debugging the code while doing so.

Some things I learned while creating and enhancing the artifact was troubleshooting. Opening a previous program from a previous class that was completed on a Virtual Machine made it hard to get it running again. The major thing was JUnit not being configured in my Eclipse. After spending time trying to get JUnit tests configured I was able to run it and test the original code. While making the change from an array list to HashMap, the code had errors in both the ContactService.java and ContactServiceTest.java. These errors weren’t difficult to debug by taking it one issue at a time. I learned how HashMaps are easier to get access to the data inside of it than array lists. The artifact was improved by replacing the existing data structure with a better one for this program. The course outcomes that I met with these enhancements are employ strategies for building collaborative environments that enable diverse audiences to support organizational decision making in the field of computer science. Design, develop, and deliver professional-quality oral, written, and visual communications that are coherent, technically sound, and appropriately adapted to specific audiences and contexts. 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. Demonstrate an ability to use well-founded and innovative techniques, skills, and tools in computing practices for the purpose of implementing computer solutions that deliver value and accomplish industry- specific goals. 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. All of the other outcomes were not met in this artifact as they did not relate with this project. There was not any feedback to incorporate as I made changes to the artifact.