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CS 499

Module Four

Milestone Three: Algorithms and Data Structures

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

This document describes my assessment and improvements made to a project from the CS 320 course, completed in May 2024. The project serves as a detailed contact management system, allowing users to easily add, and/or modify details. The enhancements are in line with the course objectives, showcasing my understanding of the material and my ability to apply the skills learned over the course. Using these modifications, I intend to demonstrate my comprehension for practical applications in computer science.

Justify the inclusion of the artifact in your ePortfolio. Why did youselect this item? What specific components of the artifact showcase yourskills and abilities in algorithms and data structure? How was theartifact improved?

I selected this artifact to address the errors I encountered last year. My aim is to improve its productivity by substituting the ArrayList with a HashMap. This adjustment is expected to substantially decrease time used for critical operations such as updating. These actions rely on linear searches within the ArrayList, but by switching to a HashMap, these vital functions will become more rapid.

I will refine the algorithms associated with updating and searching. The search functionality will be useful to utilize the contact ID in the HashMap. This will not only streamline the search process but it will also boost the overall performance of the system. The update method will focus on modifying only the required fields, thereby boosting efficiency. These comprehensive improvements aim to create an effective system, ultimately providing users with a smoother and faster experience in managing their contacts.

Did you meet the course outcomes you planned to meet with thisenhancement in Module One? Do you have any updates to your outcome-coverage plans?

I believe I have successfully met all the requirements for Milestone Three. By improving the data structure and algorithms in the contact management system, I will show my ability to create better solutions. This modification will highlight my proficiency in the strategic choice of replacing the ArrayList with a HashMap. Although this adjustment may lead to higher memory consumption, it significantly enhances operational efficiency.

Additionally, this upgrade will reflect my capability to apply strategies in selecting suitable data structures and developing algorithms. In the end, these enhancements will not only boost the system's overall performance but also increase its intrinsic value, demonstrating my dedication to excellence in software design and development.

At this moment, I don’t believe I have any new updates to share. There will always be opportunities to further refine and elevate the quality of what you produce. Continuous enhancement is the key to evolving your work.

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

I believe I have enhanced this artifact. I have come to understand that I can demonstrate my ability to improve algorithms by optimizing search functions to focus exclusively on the fields that have been modified. This effectively reduces unnecessary operations. This demonstrates my ability to develop algorithms that will lead to a more impactful solution. These improvements reflect my commitment to delivering high-quality and effective outcomes.

The challenges I faced mainly revolved around creating a code that effectively balanced complexity with simplicity. The code meets the course requirements and also opens up possibilities for future improvements. This process has been both demanding and fulfilling, as I worked through different scenarios to fine-tune my artifact.