4-2 Milestone Three: Enhancement Two: Algorithms and Data Structure

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The artifact chosen is an invoicing system designed for Davy’s auto shop services, originally developed in March 2019 during the CS-200 Computer Science Role in Industry course at SNHU. This selection was driven by my early educational experiences in computer science, marking one of my initial forays into coding. It represents an ideal artifact for enhancement as it aligns with multiple course outcomes, addressing several project requirements simultaneously. Significant enhancements were made to this system in the initial narrative phase, focusing on software design, engineering, algorithms, and data structures. These enhancements involved refining the naming conventions of dictionary keys and values, as well as modifying the system to convert user input into lowercase for dictionary searches, thus eliminating case sensitivity issues. Additionally, an ASCII art banner was integrated, treated as raw data to prevent misinterpretation of characters typically used in Python functions. For this category’s enhancement, I opted to incorporate a new ASCII art banner when displaying the total cost to the user. This enhancement involved treating the code as raw to accurately render ASCII art. The control structures were optimized by integrating if-else statements with a try-except block, thereby crafting a robust solution that accurately interprets user input under all circumstances. This modification enables the system to ascertain whether the user has chosen a valid service with a cost, a non-billable service with zero cost, or an invalid option, prompting a reselection if necessary. Such improvements have streamlined the user experience, enhancing data interpretation capabilities. Furthermore, an if statement that validates whether the selected service has an associated cost was revised for clarity. This statement now utilizes f-string formatting, significantly improving the readability of the output, making it more straightforward for code reviewers. Overall, the artifact saw substantial refinements including the introduction of new features that ensure correct interpretation, transitioning to f-string formatted outputs for clarity, refining naming conventions for better data description, adapting user input for enhanced usability, implementing exception handling for key errors, and reordering control structures for logical coherence.

During the enhancement phase, I absorbed several best practices and refined data manipulation techniques to boost code readability and alter its interpretation. One valuable best practice I adopted is prioritizing the most common outcomes in if-else statements to enhance efficiency. I also learned to utilize f-strings, which significantly tidied up complex statements and offered a fresh approach to handling data compared to my initial methods.Continuously expanding one's skill set is crucial, a trait highly valued by employers. As Zao-Sanders and Schveninger (2020) highlight, the capacity to adapt and learn is increasingly sought after, with leading global CEOs emphasizing the importance of continual learning and skill development in a dynamic world economy. This educational experience aligns perfectly with the course goal of designing and assessing computing solutions that address specific problems through algorithmic principles and computer science standards, carefully balancing the trade-offs in design decisions. This alignment confirms that the enhancement plan has effectively met the specified course outcome.