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CS-499: Milestone Three Narrative

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The artifact I chose is my “Driver.Java” file from my Rescue Animal Management System. This is a Java program that I first made in IT-145 earlier in my SNHU career. This program manages the data of dogs and monkeys, allows for users to intake new animals, view lists, and reserve them. I chose this artifact because it was a good opportunity for me to show my understanding of data structures and algorithms. At first, my program exclusively relied on ArrayList collections and used a linear search to be able to find animals which is inefficient as more animals get added. For this enhancement, I refactored the code to use HashMaps so looking up animals is faster. This enhancement shows my ability to look over and improve efficiency of existing code by putting in more appropriate data structures. I improved this artifact by adding two new data structures which were HashMap<String, Dog> dogMap and HashMap<String, Monkey> monkeyMap. These were used to be able to store and retrieve animals by their name in a timely manner instead of looping through a list. I also updated the initializeDogList() and initializeMonkeyList() methods so that it populates the HashMaps with the ArrayLists. Additionally, I updated intakeNewDog() and intakeNewMonkey() to insert new added animals into the HashMaps. Finally, I refactored reserveAnimals() method to use HashMap.get() for a faster animal lookup.

I believe that I met the course outcomes that I planned in Module One. Those course outcomes were 3 and 4. For outcome 3, I was able to design and evaluate a more efficient solution using algorithmic principles. I also met outcome 4 by applying a well know technique, HashMaps, and tools to improve my performance. While completing this enhancement, I learned how to balance my existing code with new logic that improves performance. I had to change multiple parts of my program while still maintaining its functions. A challenge that I had was adapting my old reserveAnimal() method which was already tied to the ArrayList logic. I had to completely change it so that it used user input for name lookups. This whole process allowed me to strengthen my understanding of how to apply data structures.