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CS-499

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

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Purpose

This paper is a narrative that accompanies the artifact for Algorithms and Data Structures and details why this artifact was included in my ePortfolio. It reflects on the approach used to create the artifact and focuses on the learning process that occurred thorough out the creation of it.

Prompt

The artifact selected for the Algorithms and Data Structures category is my **Zoo Monitoring System**. The project's purpose is to develop an authentication and authorization system that manages user and administrative access and data for a zoo. The project was created originally in October of 2018 as part of the IT-145 Foundations in Application Development computer science course. This program is developed in Java programming running in Apache Netbeans v16 IDE. It was originally written in the 8.2 version. The enhancement for this project was the modules for the monitoring system- Option 2 of the IT-145 Final Project Guidelines and Rubric.

Option 2: Monitoring System

As a zookeeper, it is important to know the activities of the animals in your care and to monitor their living habitats. Create a monitoring system that does all of the following:

- Asks a user if they want to monitor an animal, monitor a habitat, or exit
  Displays a list of animal/habitat options (based on the previous selection) as read from either the animals or habitats file

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  - Asks the user to enter one of the options
- Displays the monitoring information by finding the appropriate section in the file
- Separates sections by the category and selection (such as "Animal - Lion" or "Habitat -Penguin")
- Uses a dialog box to alert the zookeeper if the monitor detects something out of the normal range (These will be denoted in the files by a new line starting with *****. Do not display the asterisks in the dialog.)
- Allows a user to return to the original options

You are allowed to add extra animals, habitats, or alerts, but you may not remove the existing ones.

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The artifact was selected because it displays a solid understanding of algorithms and data structures to combine complex systems, one for authentication, one for authorization, and dashboards to display information regarding animals, habitats, or user management based on the logged in user's role. After the user logs in successfully, they are only able to see menus and data specific to their role.

```
**********************************************************************************
*                                                                                *
*                          Zoo Monitoring System                                 *
*                                                                                *
**********************************************************************************

[LOGIN]

Enter user name: lauren.lindhurst

Enter password: letmein
**********************************************************************************
*                                                                                *
*                          Zoo Monitoring System                                 *
*                                                                                *
**********************************************************************************

*-------------------------------------------------*
| Logged in as: lauren.lindhurst  |  User Role: admin |
*-------------------------------------------------*

[MAIN DASHBOARD]

Hello, System Admin!

As administrator, you have access to the zoo's main computer system.
This allows you to monitor users in the system and their roles.


[Main Menu]-------------------------------------------------------------
[x] Log out  [1] Monitor Animal  [2] Monitor Habitat  [3]User Management
```

Specific components, such as the use of different function specific classes and methods, reading external files into a data structure of a string array variable to analyze user input conditions, reading data files line by line to evaluate conditions, and reading data files to the user's display all showcase my skills and abilities in algorithms and data structures.

The artifact was improved by implementing the Monitoring System (Option 2-Monitoring System from the IT-145 Rubric). The enhancement allows the user, depending on role, to display either animal information from the animals.txt file, habitat information from the habitats.txt file, or display user information from the usermanage.txt file. The artifact was also improved through the clean-up of my code and splitting of original AuthenticationSystem class to other classes to strategically organize functions and display coding best practices.

The artifact and its enhancements implement appropriate variables, operators, methods, and classes as they are used in object-oriented programming for developing successful programs. It also utilizes appropriate syntax and conventions in terms of their best practice and use in programming. Lastly, it displays a computing solution that solves 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.

The course objectives planned in Module One were met with the implemented enhancements of the artifact. I currently do not have updates to my outcome-coverage plans, as the artifact still displays originally discussed Computer Science program outcomes.

To reflect on the enhancement process of the artifact, I reinforced my knowledge of Java (OOP) and its' libraries, I strengthened my understanding of data structures and algorithms while employing formatting best practices and logic best practices, ensuring my program design is

functional, runs as expected, and has easy to read portable code that follows industry standards. The challenges I overcame were simple syntax errors as I have not written in Java in a long time and tend to automatically code everything in C++. The errors were easily resolved and with detailed comments implemented, I was able to easily resolve any issue that occurred.

References

Southern New Hampshire University. (2018). IT-145 Final Project Guidelines and Rubric. SNHU.

Southern New Hampshire University. (2023). CS 499 Milestone Two Guidelines and Rubric Enhancement One: Software Design/Engineering. SNHU.