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CS – 499

July 28th, 2024

**Milestone Three Assessment**

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

The artifact that I chose for this category is a Java program featuring multiple travel destinations. Each destination includes a picture and a description. It was created in March 2023, during my enrollment in the CS–250 Software Development Lifecycle course. I believe this project would be a great candidate for further enhancement to meet this category's requirements. For the previous milestone, I ported the Java application to Python, added more destinations, expanded the descriptions, and implemented a feature where clicking on a destination’s image or description changes the background color to highlight the selected row.

For this category, I further enhanced the artifact by implementing a feature that hides the travel destinations window until the user logs in with the correct username and password. Once the user clicks the login button, they are authenticated, and the window displaying the list of destinations appears. Within the travel destinations window, I also added a search bar that allows users to search for keywords in either the images or descriptions. After clicking the “Search Destinations” button, the query undergoes a linear search to display the images and descriptions containing the specified keyword.

**Justify the inclusion of the artifact in your ePortfolio. Why did you select this item? What specific components of the artifact showcase your skills and abilities in software development? How was the artifact improved?**

I selected this item to enhance further because I wanted to learn more about the Tkinter library in Python. I was eager to learn how to implement more functionality within the library, and I thought that this was a perfect opportunity to do so. Additionally, with the enhanced functionality, I was able to learn new things, such as optimizing the search algorithm and developing the application the way I had envisioned.

The enhancements to the artifact showcase my skills and abilities in development with the implementation of a search query, which demonstrates best coding practices. The enhancement of a linear search algorithm within the application mitigates redundant iterations through the code while displaying the destination images and descriptions. With this being said, the optimization of the average search algorithm in Big-O notation is O(n), while the best case is O(1).

**Did you meet the course objectives you planned to meet with this enhancement in Module One? Do you have any updates to your outcome-coverage plans?**

I have met the planned course outcomes in Module One with this enhancement implementation. A course outcome I align with is number three, which is the utilization of algorithmic principles, computer science practices, and standards appropriate to its solution while managing trade-offs. I met this outcome by implementing a search feature within the application. This feature utilizes a linear search algorithm, which enhances the overall optimization of the artifact.

I align with course outcome number four, which is to demonstrate an ability to use well-founded and innovative techniques, skills, and tools in computing practices to implement computer solutions that deliver value. This course outcome was met by organization of data structures, including classes and functions that handle the programs behavior correctly. This ensures that any search algorithm or login feature functions as anticipated.

The login feature aligns with course outcome number five, which is developing a security mindset that anticipates adversarial exploits in software architecture and design. This is met because the user has to log in with the correct credentials and be authenticated before the travel destination window is displayed. Lastly, the user must use the correct capitalization when entering their login information, otherwise an error window will appear, notifying the user of an incorrect username or password. As of now, I do not have any updates to my outcome-coverage plans.

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

One thing that I learned from this enhancement was how to incorporate a linear search algorithm that reduces redundancy iterating through images and descriptions to enhance optimization. Another concept that I have learned with this enhancement was to implement a login functionality which allows the login window to be displayed before the Top Travel Destinations window appears. I also learned how to create a search bar, along with correct login functionality within a Python application. In my past educational experiences, I have not worked with these functionalities. Therefore, I am glad I was able to incorporate them effectively within the application.

I did face some challenges along the way with this enhancement, one of which was learning new functionalities for implementation. Another challenge I encountered was three weak warnings within the code; however, the weak warnings do not affect the behavior of the program in any way. Therefore, I am under the assumption that they are not vital to the functionality of the application.