CS-499-11429  
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4-2 Milestone Three: Enhancement Two: Algorithms and Data Structure

The artifact I have chosen is called Spaceship Escape it was a project from IT140. It is a text-based adventure that was originally made in python. I created the code for the project in python almost two years ago when I was in IT140. Spaceship Escape!!! Is a text-based game that has the player travelling through a ship looking for survival items to use an escape pod to escape to safety.

I chose this artifact for my ePortfolio as it would allow me to not only return to one of the first projects, I developed but also showcase how far I have come. I knew when I heard a project needed to be selected I could have so much potential in where I could take this artifact. This artifact will allow me to showcase my skills in Algorithms and Data Structures by allowing me to develop algorithms that solve problems within the code and ensuring that I can showcase my experience with Array List and HashMap’s to randomize the games room setup to allow players to experience a new way game every time they load the game. Spaceship Escape was improved by implementing a timer that would add intensity to the game and more urgency to reach the end while also developing algorithms to randomize the room layout so every time a player started the game the map and layout would be different leading to a new experience every game. Adding replay value and intensity is healthy for the gameplay experience.

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

I did meet the course outcomes I planned to meet with this enhancement. I was able to solve gameplay issues utilizing an algorithm to encourage replay ability while also utilizing data structures such as an array list and hash maps to ensure the map was designed in a way to encourage player exploration. No further updates with my outcome coverage plans, it is going as expected and I plan to reach my final two outcomes during the final enhancement.

“Design and evaluate computing solutions that solve 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.”

I showcased and met this outcome by creating algorithms that would solve the problem of a game timer and of room randomization. With this I have been able to utilize algorithmic principles and computer science practices and standards that were able to appropriately solve the problem at hand. To overcome these challenges, I utilized Array Lists and HashMap’s to better randomize the rooms while also ensuring consistency in room connectivity. With this enhancement I introduced uncertainty and a timer to players of the game. Although this was an initial downside for the player this will add more intensity and engagement for the player base while also introducing a more interactive experience when playing through the game. In order to meet the expectations of the enhancement I also had to keep in mind the potential trade-offs and effects this would have on the original aspect and design of the game. Removing description guides of where the player should move to encourage a more exploration-based gameplay was important to increasing the playability of the game.

I optimized my code by ensuring the systems I utilized would benefit not only the player but also the efficiency of the games code. I utilized countdown timer for use when working on my in-game timer. Using the built in java tool ensured I the countdown was accurate, updated, and ensured I could avoid having to loop through the timer as I initially attempted to. Time complexity was very important when it came to ensuring consistent usage and efficiency of the game. Utilizing lists, HashMap’s, loops, and timers meant I needed to ensure the game was running smoothly and was optimized appropriately. O(n) complexity was used when going through the rooms of the ship and when setting a timer number. Were as O(1) complexity Was involved when adding or manipulating lists, HashMap’s, and each tick of the timer since those aspects would remain constant. Ensuring the complexity also ensured that each game state would follow the same rules and ensure game completion was always possible.

The efficiency of Algorithmic logic was important in ensuring the smooth gameplay and running of spaceship escape. By ensuring the countdown timer provided real time accurate feedback and ensuring the timer updated appropriately helped the users gameplay experience and the efficiency in how the system runs. I also focused on adding, removing, and cycling rooms from lists to ensure I could sort the rooms in the order they needed to without needing to do unnecessary checks as I know since the rooms were removed or added it was working as expected. By ensuring to focus on the optimization, time complexity, and algorithmic logic efficiency elements I was able to ensure the game was accurate, efficient, and engaging to the player experience.

During my time working on Enhance two Algorithms and Data Structures on my artifact I was able to really explore the goals I wanted the enhancement to meet. During the creation and improvement process I learned that truly it can be a never-ending journey if you let it. Throughout the enhancement process I found myself constantly wanting to expand or improve the experience while also trying to navigate the changes within the code. I faced many challenges throughout this enhancement, breaking down and understanding the algorithms I was trying to utilize was difficult. Knowing what I wanted but being unable to reach the goals logically was difficult. I was able to exceed my goals with my timer enhancement, but the room randomization was extremely difficult and something I am still struggling to work out completely, I have it so the rooms are randomized and the items and room descriptions are showing I am just encountering issues of some rooms being left out of the connections. Which is detrimental to the health and goal of the game. Overcoming these challenges has helped me learn how to process these challenging moments and work around issues to find a solution.