

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

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The artifact I have chosen for Enhancement Two: Algorithms and Data Structure is enhancing the search algorithm of my python application that handles data about pets in animal shelters. To enhance the search algorithm, I used PyCharm, an integrated development environment (IDE). My application is written using python, which is a high-level programming language. I decided to use this application due to its large number of algorithms and programming logic already created. I originally created this application during the 22EW4 term in class CS-340 Client/Server Development.

I determined this was the best project to enhance due to the fact of how popular the python programming language is. According to a Stack Overflow survey from 2021, python was ranked the 4th most popular language. It is widely used in a vast amount of web and game development which is areas I accel in. Currently what is becoming popular and rising in the real world is machine learning and artificial intelligence (AI), and python is used highly within those fields. With the recent influx of AI and machine learning happening around the world, joining a team now would allow me to become part of something great in the near or distant future with the rise of new creations from machine learning and AI.

Within my application I showcase a large amount of my skills using the python programming language within PyCharm. Originally it was cluttered, and not organized very well, it was inefficient, and worked although it could be much better and more efficient as the more features and improvements you make the increasing number of lines you can create and with more features comes more resource usage and loads on machines. To enhance this application, I updated functions within the dashboard of my application. My application uses a lot of filtering to display data pulled from a database. Filters I have included in my python code were inside

functions and it would make it harder to read and reuse, to fix this I placed filters in their own area not within my function, this ideal step was something new I learned, and it made it easier to read and customize my application by having this enhancement. Another aspect of my enhancing was more optimizing, and this further enhanced my search algorithms. I achieved this by working on changing my data structure. I learned I can create a dictionary using `filter_criteria`, and not use duplicate queries in my python code, this also shortened my code making it easier to maintain and debug if any issues were to arise. Lastly, I created regex patterns such as `create_regex_pattern(keywords)`: to further simplify the structure of the code making it more readable, and with these enhancements I have a much nicer and easier to read modular structure with enhanced searching algorithms. From this artifact's original state of a mediocre searching algorithms and data structure to its enhanced optimizations, and redefined structure I have showcased my knowledge and skills outlined in the course outcomes where I design, develop, and deliver professional-quality oral, written, and visual communications that are coherent, technically sound, and appropriately adapted to specific audiences and contexts. I also showcased my knowledge and skills where I 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 (data structures and algorithms) and I achieved this with showcasing what I learned in creating a dictionary and adding helper functions.

During the enhancement of my artifact, I learned a large amount of information with the python programming language that I was unaware of. I learned how to add dictionaries to my code and

doing that I was able to read and improve my code easier than before. The number of additional features that is available I now am knowledgeable with has increased. My current and future applications will now showcase new knowledge I have inherited. My applications are now more modular, they are simplified, and my redundancy has been reduced, the overall structure of my code I write is well optimized. The only challenge I faced was not being able to optimize my artifact even further as I am aware of some additional improvements I plan to make on my own time as learning these new techniques opened a whole new world of ideas. Choosing this artifact to enhance was a challenge from the beginning and it was intimidating to look at, failure wasn't an option and succeeding in doing so brought a lot of confidence my way and I am a much better python programming language user because of it.