

Linked Lists Journal Entry

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CS 260 Data Structures and Algorithms

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Evaluate the pair (i.e., the data structure and algorithm) that you applied in this module. Specifically, answer the following questions:

What were the **strengths** of the pair in solving the problem? In other words, why do you think the provided data structure and algorithm made sense as a pair for the given task? Support your claims with specific evidence from the course materials.

For the given task, it makes sense to use a linked list as it properly shows the uses and implementations of the data structure and algorithms. For a non-continuous set of data, in addition to smaller scale operations, it may make more sense to use linked lists. Although some of the other options that are able to be implemented maybe faster, or easier, overcomplicating an issue could take more time in the long run, and cause other issues down the road with the size of the program and the ability to implement it on a multitude of computers, making it harder for users to be able to interact with the program, and growing the potential for programs to crash, or even for them to be less secure if everything is not built and implemented correctly.

What were the **weaknesses** in the pair for solving the given problem? In other words, what was it about either the data structure or the algorithm that might make you consider alternatives? Alternatively, if you feel there were no significant weakness in the pairing, provide a circumstance where this pairing would be inadequate for solving a problem. Support your claims with specific evidence from the course materials.

Although the capability is there the many drawbacks included begin to really expose themselves when scale is involved. One example of this is the time that it takes to compute the data within the given structure or model. What this really depends on is the type of data that we are using which is what helps us decide what the best type of data structure is. Like I had said before, if we use the example of a shopping cart, a double linked list would be much better than a single linked list, as the double linked list lets us use the algorithm in order to go back and forth between different items within the list, instead of having to reiterate through the entire list again just to find the item that the customer may want to take out of their shopping cart. Another example of a weakness is the warehouse, where there are way too many items to properly be used or implemented in an efficient manner, for this it may be easier to have individual access to every object, instead of having to go to and from each object in the list to another, which is why a hash map would be the better choice over that of a linked list for bigger projects.

Brainstorm **other possible applications** for the pair. How could the pair be used to solve problems relating to your own personal or professional interests? Illustrate your response with specific details.

The linked list data structure can be implemented into many different scenarios in which are useful to apply in the real world. The strengths given to the data structure with the implemented algorithms are powerful in the sense that in the real world there are instances where you can apply these same data structures and use the algorithms to find conclusive evidence to help further the lives of everyone affected by the software, such as an online shopping cart or on a much larger scale, an inventory management system for a warehouse or company such as Amazon for example. The reason this is important is due to the mass amount of scale that companies use and need to be so profitable, and the answers they are able to conclude with and find with the ability to manipulate the intake of data given to them by customers that shop at their store, being able to know what they need to order more of, and less of. Where the real power comes in is when you are able to cross reference the actions of customers with other types of data such as sociological impacts on the target audience you are selling to. With the addition of this information, we are able to see the ebb and flow of a much bigger picture, which creates a kind of exponential growth modeled after the actuality of science in real time.