**Week 3: PE03 – Programming Exercise**

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CS469: Data Structures/Algorithms

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**Programming Exercise – PE03**

1. **Question 1: As part of the assignment, compare the actual runtime of insert operation between two lists and justify in a short paragraph on how they perform.**

When I ran the program, the insert operation using the simple array took about 8.49e-06 seconds, while the linked list version took around 1.29e-05 seconds. This shows that inserting with the array was a bit faster, likely because Python lists are very efficient when using the insert() method. In contrast, the linked list needs to create a node and update a pointer, which adds a little more overhead. For the delete operation, the simple array had a time of 3.63e-06 seconds, while the linked list took about 3.51e-06 seconds. This was almost identical, but the linked list actually had a slight edge here. As for lookup, the simple array was slightly slower at 1.24e-06 seconds compared to the linked list’s 1.11e-06 seconds. Overall, the differences are small for this short list, but it was cool to actually see them in action! This assignment helped me understand how both arrays and linked lists can be used to build stacks, and now I feel more confident using either structure depending on what I need to do.A computer screen with white text

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