**Data Structures and Algorithms**

Assignment

**Linked List, Stacks, And Queues**

*Submitted by:*

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*Submitted to*

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I. Objectives

In this section, the goals in this laboratory are:

* To define the key terms in Data Stuctures And Algorithms
* To be able to know the differences between Linked Lists and Arrays and the real-world applications of Linked Lists

II. Methods

General Instruction:

1. Define and discuss the following Object-oriented programming concepts:
2. What is a singly linked list, and how does it differ from an array?

*🡪* ***A Singly linked list*** *refers to a type of data structure made of nodes created using self-referential structures.A self-referential structure is a type of structure which python iterates by calling itself to execute and process data until the last one,in which it will terminate. The* ***head node*** *is the first node seen in the structure where python would start iterating. After processing the entire head node, it then proceeds to iterate the next node until it reaches the last node called the* ***null node****, similar to reading a book sequentially. It differs from an array in the sense that linked lists sequentially iterate data from one node to another. On the other hand, arrays can have multiple instances of data in the same element and can be accessed quickly.*

1. When would you prefer a linked list over an array, and vice versa?

* *If you want to sequentially read data and there are fewer instances of data, you can use a linked list to do so, but if you have numerous instances of data and you want to quickly find that specific data by its index, you can use arrays.*

1. How are linked lists used in real-world applications (e.g., browser history, undo functionality)?

*🡪 In* ***browser history****, linked lists are utilized to access the previous and next URL searched in a browser by pressing the back and next buttons.*

*In the undo functionality, if a user wants to revert the changes they made, for example,in* ***microsoft word****, the user would press the undo button to do so. Linked lists enable this feature due to its sequential structure.*

III. Conclusion

This research taught me the fundamental concepts of **Data Structures And Algorithms**, particularly in python. The real world applications of **Linked Lists and Arrays** are essential for efficient and structured way of storing, processing and arranging huge amount of data in today’s world. Without these tools, it will take more time to do the tasks mentioned previously.

**References**

Book

[1]

Website

[1] GeeksforGeeks. (2025, July 23). *Singly linked list in Python*. GeeksforGeeks. <https://www.geeksforgeeks.org/python/singly-linked-list-in-python/> (accessed August 15,2025)

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[3] GeeksforGeeks. (2025a, July 11). *Applications of linked list data structure*. GeeksforGeeks. <https://www.geeksforgeeks.org/dsa/applications-of-linked-list-data-structure/>

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