DSA THEORY Exercise 4

Q5) **1. Understanding Linked Lists**

**Singly Linked List**:

* Consists of nodes where each node contains data and a pointer to the next node.
* Simple structure; allows easy insertion and deletion.

**Doubly Linked List**:

* Each node contains data, a pointer to the next node, and a pointer to the previous node.
* Enables bidirectional traversal, making some operations faster (e.g., deletion).

**4. Analysis**

**Time Complexity**:

* **Add**: O(1) for beginning, O(n) for specific positions.
* **Search**: O(n).
* **Traverse**: O(n).
* **Delete**: O(n) (finding the node).

**Advantages over Arrays**:

* Dynamic size, easy insertion and deletion.
* No need for resizing, unlike arrays.