**MONICA B (SUPERSET ID - 5008627)**

**Exercise 5: Task Management System**

1. Explain the different types of linked lists (Singly Linked List, Doubly Linked List).

**Singly Linked List :-**

1. Each node contains data and a reference to the next node.

2.The last node points to the NULL node.

3.Operations like insertion and Deletion are done easily and efficiently.

**Doubly linked list :-**

1.Each node contains data, a reference to the next node, and a reference to the previous node.

2.The first node's previous pointer and the last node's next pointer point to NULL.

3.Allows traversal in both directions.

1. Analyze the time complexity of each operation.

Add: O(n) - Adding a task requires traversing to the end of the list.

Search: O(n) - Searching for a task requires traversing the list.

Traverse: O(n) - Traversing involves visiting each node once.

Delete: O(n) - Deleting a task requires searching for it first.

1. Discuss the advantages of linked lists over arrays for dynamic data.

Advantages over Array list :-

1.Linked lists can grow and shrink dynamically without the need for resizing.

2.Insertions and deletions can be more efficient, especially for large data sets

3. Easy implementation of abstract data types, and more efficient sorting in some cases.