

## Ex 5: Task Management System

### Singly Linked List:

- Each node contains data and a reference (link) to the next node.
- Efficient for sequential traversal and dynamic memory allocation.

### Doubly Linked List :

- Each node contains data, a reference to the next and **previous** node.
- Allows traversal in both directions.

### Time Complexity:

Add Task:

Time Complexity:  $O(n)$

Search Task:

Time Complexity :  $O(n)$

Delete Task :

Time Complexity :  $O(n)$

Traverse Tasks :

Time Complexity:  $O(n)$

### Advantages of linked list over array

Dynamic Size: Grows/shrinks as needed.

Efficient Insert/Delete: No shifting needed.

No Random Access: Slower than arrays for index-based access.

Memory Efficient: Allocates memory as required.