**Exercise 5: Task Management System**

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

Types of Linked Lists

1. Singly Linked List: Each node contains data and a reference to the next node in the sequence. It allows traversal in one direction (forward).
2. Doubly Linked List: Each node contains data, a reference to the next node, and a reference to the previous node. This allows traversal in both directions (forward and backward).

**Analyze the time complexity of each operation.**

Time Complexity of Operations

1. Add Task: O(n) - Adding a task requires traversing the list to find the end.
2. Search Task: O(n) - Searching for a task may require checking each node.
3. Traverse Tasks: O(n) - Traversing the list involves visiting each node once.
4. Delete Task: O(n) - Deleting a task may require traversing the list to find the node to delete.

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

Advantages of Linked Lists over Arrays for Dynamic Data

1. Dynamic Size: Linked lists can grow and shrink dynamically, making them suitable for situations where the number of elements changes frequently.
2. Efficient Insertions/Deletions: Inserting or deleting elements in a linked list does not require shifting elements, making these operations more efficient than in arrays.