**Exercise 5:**

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

* Singly Linked List: Each node points to the next node; traversal is one-directional.
* Doubly Linked List: Each node points to both the next and previous nodes; allows bidirectional traversal.

Analyze the time complexity of each operation.

| Operation | Time Complexity | Reason |
| --- | --- | --- |
| Add Task | O(n) | Traverse to end to add task |
| Search Task | O(n) | Linear search through list |
| Traverse | O(n) | Visit each node once |
| Delete Task | O(n) | Search + remove node |

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

Dynamic size: No need to predefine the size.

Easier insertions/deletions without shifting elements.

Efficient memory usage for frequently changing data.

Output:

