**5. Task Management System**

**Understanding Linked Lists**

Linked lists are linear data structures where elements (nodes) are connected using pointers. In a **Singly Linked List**, each node points only to the next node. In contrast, a **Doubly Linked List** has two pointers—one pointing to the next node and another to the previous one. Singly linked lists are memory-efficient and simple to implement, making them ideal for dynamic data where frequent insertions and deletions are expected.

**Analysis**

* **Add Operation**: O(n) if added at the end (without a tail pointer), O(1) if added at the head.
* **Search Operation**: O(n), as each node must be checked.
* **Traverse Operation**: O(n), requires visiting all nodes.
* **Delete Operation**: O(n), needs to locate the node and update links.

Linked lists are advantageous over arrays in scenarios where the size of data changes frequently. Unlike arrays, they don’t require resizing or shifting elements, which makes them better suited for task management systems with dynamic additions and deletions.

**Output**

**A screenshot of a computer program

AI-generated content may be incorrect.**