Ex 6: Library Management System

Linear Search:

- Traverses each element in a list one-by-one until the desired value is found.
- **Time Complexity:**
    - Best Case: O(1) (first element)
    - Worst Case: O(n) (last or not found)

Binary Search:

- Efficient search on a sorted list by repeatedly dividing the search interval in half.
- **Time Complexity:**
    - Best Case: O(1)
    - Worst Case: O(log n)

Time Complexity:

Linear Search:

- **Best Case:** O(1) – when the item is at the beginning.
- **Worst Case:** O(n) – when the item is at the end or not found.

Binary Search:

- **Best Case:** O(1) – when the item is in the middle.
- **Worst Case:** O(log n) – divides the list in half each step.

When to Use:

Linear Search:

Use when the list is small or unsorted.

Binary Search:

Use when the list is large and sorted.

Must sort the list first if not already sorted (O(n log n)).