Exercise 6: Library Management System

1. Understand Search Algorithms:

o Explain linear search and binary search algorithms.

=Search Algorithms:

1. Linear Search:

Sequentially checks each element until the target is found or the end is reached.

2. Binary Search:

Divides the sorted array into halves to find the target.

4. Analysis:

o Compare the time complexity of linear and binary search.

= Time Complexity Analysis:

1. Linear Search:

- Best-case: O(1)

- Average-case: O(n)

- Worst-case: O(n)

2. Binary Search:

- Best-case: O(1)

- Average-case: O(log n)

- Worst-case: O(log n)

o Discuss when to use each algorithm based on the data set size and order.

= When to use:

- Linear Search: Suitable for small or unsorted datasets.

- Binary Search: Suitable for large and sorted datasets.