**MONICA B (SUPERSET ID - 5008627)**

**Exercise 6: Library Management System**

1. Explain linear search and binary search algorithms.

Linear Search :-

The linear search algorithm is a sequential search technique that begins at one end of a list and iterates through each element until the target element is located; otherwise, the search continues to the end of the dataset.

Binary Search :-

Binary Search are the two popular searching techniques.That works well on sorted lists. To search for an element in a list using the binary search approach, we must first guarantee that the list is sorted.

1. Compare the time complexity of linear and binary search.

**Linear Search:** O(n) - Each element is checked once in the worst case.

**Binary Search:** O(log n) - The search space is halved with each step.

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

Linear search - It is used when a dataset is tiny or unsorted. The algorithm's simplicity makes it an excellent choice when performance is not a top priority.

Binary search. - Its logarithmic temporal complexity allows it to perform much quicker than linear search on huge datasets. To use binary search, the dataset must be sorted.