**Library Management System**

**Understand Search Algorithms:**

**Explain linear search and binary search algorithms.**

Binary Search

It finds the mid value by using (low+right)/2, each time the mid element is checked

with the target. The values of low and right are adjusted based on the mid index value of

Array to reach the target

Linear Search

It compares each and every value in the array with the target, and finds the target element

Time Complexity of Linear and Binary Search:

* Linear Search:
  + Best Case: O(1) – When the target element is the first element.
  + Average and Worst Case: O(n) – When the target element is in the middle or end of the list, or not present at all.
* Binary Search:
  + Best Case: O(1) – When the target element is the middle element.
  + Average and Worst Case: O(log n) – When the list is repeatedly divided in half to find the target element.

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

Binary search is best when data set size and order are taken under concern, as it’s worst

Time complexity O(log(n)) which is better than linear search’s time complexity