**Exercise 6: Library Management System**

**Scenario:**

**You are developing a library management system where users can search for books by title or author.**

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

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**Linear Search** is a straightforward algorithm used to find a target value within a list. It works by examining each element in the list sequentially until it either finds the target value or reaches the end of the list. If the target value matches the current element, the algorithm returns the index or the element itself. If not, it proceeds to the next element. This process continues until the target is found or the end of the list is reached.

**Binary Search** is a more efficient algorithm, but it requires the list to be sorted beforehand. It works by repeatedly dividing the search interval in half. The algorithm starts with the entire sorted list and determines the middle element. If the middle element matches the target value, the search is complete. If the target value is less than the middle element, the search continues in the left half of the list. Conversely, if the target is greater, the search continues in the right half. This process of halving the search interval continues until the target is found or the interval becomes empty.