**Exercise 6: Library Management System**

**Scenario:**

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

**Linear Search**

* **Explanation**: In a linear search, I go through each book one by one and compare its title with the target title until I find the match or reach the end of the list.
* **Time Complexity**: O(n) because I might need to check each book in the worst case.

**Binary Search**

* **Explanation**: In a binary search, I first ensure the books are sorted by title. Then, I repeatedly split the list in half and compare the middle book's title with the target title. If they match, I'm done. If the target title is greater, I search the right half; if smaller, the left half.
* **Time Complexity**: O(logn) because I halve the list with each step.

**Comparison and Usage**

* **Time Complexity**: Linear search is O(n) and binary search is O(logn).
* **When to Use**:
  + **Linear Search**: Best for small or unsorted datasets.
  + **Binary Search**: Ideal for large and sorted datasets since it's much faster in those cases.