SUPERSET ID-6413402

**Exercise 6: Library Management System (Linear + Binary Search)**

CODE:

import java.util.Arrays;

class Book {

int bookId;

String title;

String author;

public Book(int bookId, String title, String author) {

this.bookId = bookId;

this.title = title;

this.author = author;

}

public String toString() {

return bookId + " | " + title + " | " + author;

}

}

public class LibrarySearch {

public static int linearSearch(Book[] books, String targetTitle) {

for (int i = 0; i < books.length; i++) {

if (books[i].title.equalsIgnoreCase(targetTitle)) return i;

}

return -1;

}

public static int binarySearch(Book[] books, String targetTitle) {

int low = 0, high = books.length - 1;

while (low <= high) {

int mid = (low + high) / 2;

int cmp = books[mid].title.compareToIgnoreCase(targetTitle);

if (cmp == 0) return mid;

else if (cmp < 0) low = mid + 1;

else high = mid - 1;

}

return -1;

}

public static void main(String[] args) {

Book[] books = {

new Book(1, "C Programming", "Dennis Ritchie"),

new Book(2, "Java Fundamentals", "Herbert Schildt"),

new Book(3, "Python Basics", "Mark Lutz")

};

// Linear Search

int linearIndex = linearSearch(books, "Java Fundamentals");

System.out.println("Linear Search:");

System.out.println(linearIndex != -1 ? books[linearIndex] : "Not found");

// Binary Search

Arrays.sort(books, (a, b) -> a.title.compareToIgnoreCase(b.title));

int binaryIndex = binarySearch(books, "Python Basics");

System.out.println("Binary Search:");

System.out.println(binaryIndex != -1 ? books[binaryIndex] : "Not found");

}

}

OUTPUT:

Linear Search:

2 | Java Fundamentals | Herbert Schildt

Binary Search:

3 | Python Basics | Mark Lutz

