**Exercise 6  
Library Management System**

Book.java:

p**ackage** library;

**public** **class** Book {

**private** String bookId;

**private** String title;

**private** String author;

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

**this**.bookId = bookId;

**this**.title = title;

**this**.author = author;

}

**public** String getBookId() {

**return** bookId;

}

**public** String getTitle() {

**return** title;

}

**public** String getAuthor() {

**return** author;

}

**public** String toString() {

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

}

}

SearchUtils.java:

**package** library;

**import** java.util.Arrays;

**import** java.util.Comparator;

**public** **class** SearchUtils {

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

**for** (Book book : books) {

**if** (book.getTitle().equalsIgnoreCase(targetTitle)) {

**return** book;

}

}

**return** **null**;

}

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

Arrays.*sort*(books, Comparator.*comparing*(Book::getTitle)); // Sort before searching

**int** left = 0, right = books.length - 1;

**while** (left <= right) {

**int** mid = left + (right - left) / 2;

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

**if** (cmp == 0) **return** books[mid];

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

**else** right = mid - 1;

}

**return** **null**;

}

}

LibraryTest.java:

**package** library;

**public** **class** LibraryTest {

**public** **static** **void** main(String[] args) {

Book[] books = {

**new** Book("B101", "The Alchemist", "Paulo Coelho"),

**new** Book("B102", "Wings of Fire", "A.P.J. Abdul Kalam"),

**new** Book("B103", "Ponniyin Selvan", "Kalki Krishnamurthy"),

**new** Book("B104", "Atomic Habits", "James Clear")

};

String target = "Ponniyin Selvan";

Book foundLinear = SearchUtils.*linearSearch*(books, target);

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

System.***out***.println(foundLinear != **null** ? foundLinear : "Not found");

Book foundBinary = SearchUtils.*binarySearch*(books, target);

System.***out***.println("\nBinary Search Result:");

System.***out***.println(foundBinary != **null** ? foundBinary : "Not found");

}

}

**Output:**

