Library Management System

Book.java

public class Book {

private int bookId;

private String title;

private String author;

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

this.bookId = bookId;

this.title = title;

this.author = author;

}

public int getBookId() {

return bookId;

}

public String getTitle() {

return title;

}

public String getAuthor() {

return author;

}

public String toString() {

return "BookID: " + bookId + ", Title: " + title + ", Author: " + author;

}

}

LibrarySearch.java

import java.util.Arrays;

import java.util.Comparator;

public class LibrarySearch {

public static Book linearSearchByTitle(Book[] books, String title) {

for (Book book : books) {

if (book.getTitle().equalsIgnoreCase(title)) {

return book;

}

}

return null;

}

public static void sortBooksByTitle(Book[] books) {

Arrays.sort(books, Comparator.comparing(Book::getTitle, String.CASE\_INSENSITIVE\_ORDER));

}

public static Book binarySearchByTitle(Book[] books, String title) {

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

while (left <= right) {

int mid = (left + right) / 2;

int comp = books[mid].getTitle().compareToIgnoreCase(title);

if (comp == 0)

return books[mid];

else if (comp < 0)

left = mid + 1;

else

right = mid - 1;

}

return null;

}

}

LibrarySystem.java

import java.util.Scanner;

public class LibrarySystem {

public static void main(String[] args) {

Book[] books = {

new Book(101, "The Alchemist", "Paulo Coelho"),

new Book(102, "1984", "George Orwell"),

new Book(103, "To Kill a Mockingbird", "Harper Lee"),

new Book(104, "Pride and Prejudice", "Jane Austen")

};

Scanner scanner = new Scanner(System.in);

System.out.print("Enter book title to search: ");

String title = scanner.nextLine();

Book resultLinear = LibrarySearch.linearSearchByTitle(books, title);

if (resultLinear != null)

System.out.println("Linear Search Found: " + resultLinear);

else

System.out.println("Linear Search: Book not found.");

LibrarySearch.sortBooksByTitle(books);

Book resultBinary = LibrarySearch.binarySearchByTitle(books, title);

if (resultBinary != null)

System.out.println("Binary Search Found: " + resultBinary);

else

System.out.println("Binary Search: Book not found.");

scanner.close();

}

}

Output

