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Assessment 1:Shopping App

```
package com.wipro.assesment1;
import java.util.LinkedList;
import java.util.Queue;
import java.util.Scanner;
import java.util.Stack;

// ShoppingCart class
class ShoppingCart {
    private LinkedList<String> cart;

    public ShoppingCart() {
        cart = new LinkedList<>();
    }

    // Add an item to the cart
    public void addItem(String item) {
        cart.add(item);
        System.out.println(item + " added to the cart.");
    }

    // Remove an item from the cart
    public void removeItem(String item) {
        if (cart.remove(item)) {
            System.out.println(item + " removed from the cart.");
        } else {
            System.out.println(item + " not found in the cart.");
```

```
        }
    }

    // View all items in the cart
    public void viewCart() {
        if (cart.isEmpty()) {
            System.out.println("The cart is empty.");
        } else {
            System.out.println("Cart contains: " + cart);
        }
    }

    // Get the current cart (for purchase history)
    public LinkedList<String> getCart() {
        return new LinkedList<>(cart);
    }
}

// PurchaseHistory class
class PurchaseHistory {
    private Stack<LinkedList<String>> history;

    public PurchaseHistory() {
        history = new Stack<>();
    }

    // Save the current cart to purchase history
    public void saveCart(LinkedList<String> cart) {
        history.push(new LinkedList<>(cart));
        System.out.println("Cart saved to purchase history.");
    }
```

```
    // Undo the last purchase
    public LinkedList<String> undoLastPurchase() {
        if (!history.isEmpty()) {
            LinkedList<String> lastPurchase = history.pop();
            System.out.println("Last purchase undone: " + lastPurchase);
            return lastPurchase;
        } else {
            System.out.println("No purchases to undo.");
            return new LinkedList<>();
        }
    }

    // View the entire purchase history
    public void viewHistory() {
        if (history.isEmpty()) {
            System.out.println("No purchase history.");
        } else {
            System.out.println("Purchase history: " + history);
        }
    }
}


class CustomerService {
    private Queue<String> serviceRequests;

    public CustomerService() {
        serviceRequests = new LinkedList<>();
    }
```

```
    // Add a customer service request
    public void addRequest(String request) {
        serviceRequests.add(request);
        System.out.println("Customer service request added: " + request);
    }

    // Process the next customer service request
    public void processNextRequest() {
        if (!serviceRequests.isEmpty()) {
            String request = serviceRequests.poll();
            System.out.println("Processing customer service request: " + request);
        } else {
            System.out.println("No customer service requests to process.");
        }
    }

    // View pending customer service requests
    public void viewPendingRequests() {
        if (serviceRequests.isEmpty()) {
            System.out.println("No pending customer service requests.");
        } else {
            System.out.println("Pending customer service requests: " + serviceRequests);
        }
    }
}

// Main class to integrate all the above
public class ShoppingApp {
    public static void main(String[] args) {
        ShoppingCart cart = new ShoppingCart();
        PurchaseHistory history = new PurchaseHistory();
```

```
CustomerService service = new CustomerService();
Scanner scanner = new Scanner(System.in);
int choice;

do {
    System.out.println("1. Add item to cart");
    System.out.println("2. Remove item from cart");
    System.out.println("3. View cart");
    System.out.println("4. Save cart to purchase history");
    System.out.println("5. Undo last purchase");
    System.out.println("6. View purchase history");
    System.out.println("7. Add customer service request");
    System.out.println("8. Process next customer service request");
    System.out.println("9. View pending customer service requests");
    System.out.println("0. Exit");
    System.out.print("\nEnter your choice: ");
    choice = scanner.nextInt();
    scanner.nextLine();

    switch (choice) {
        case 1:
            System.out.print("Enter item to add: ");
            String addItem = scanner.nextLine();
            cart.addItem(addItem);
            break;
        case 2:
            System.out.print("Enter item to remove: ");
            String removeItem = scanner.nextLine();
            cart.removeItem(removeItem);
            break;
        case 3:
```

```
            cart.viewCart();
            break;
        case 4:
            history.saveCart(cart.getCart());
            break;
        case 5:
            history.undoLastPurchase();
            break;
        case 6:
            history.viewHistory();
            break;
        case 7:
            System.out.print("Enter customer service request: ");
            String request = scanner.nextLine();
            service.addRequest(request);
            break;
        case 8:
            service.processNextRequest();
            break;
        case 9:
            service.viewPendingRequests();
            break;
        case 0:
            System.out.println("Exiting...");
            break;
        default:
            System.out.println("Invalid choice. Please try again.");
    }
} while (choice != 0);

scanner.close();
```

```
    }
}
```

Assessment 2: Library Management System

```
package com.wipro.assesment1;
import java.util.ArrayList;
import java.util.Collections;
import java.util.List;
import java.util.Scanner;

class Book implements Comparable<Book> {
	private String title;
	private String author;
	private String ISBN;

	public Book(String title, String author, String ISBN) {
		this.title = title;
		this.author = author;
		this.ISBN = ISBN;
	}

	public String getTitle() {
		return title;
	}

	public String getAuthor() {
		return author;
	}
```

```
    public String getISBN() {
        return ISBN;
    }

    @Override
    public int compareTo(Book other) {
        return this.title.compareTo(other.title);
    }

    @Override
    public String toString() {
        return "Title: " + title + ", Author: " + author + ", ISBN: " + ISBN;
    }
}

class Library {
    private List<Book> books;

    public Library() {
        books = new ArrayList<>();
    }

    // Add a book to the library
    public void addBook(Book book) {
        books.add(book);
        Collections.sort(books);
        System.out.println(book.getTitle() + " added to the library.");
    }

    // Remove a book from the library
```

```
public void removeBook(String title) {
        Book toRemove = null;
        for (Book book : books) {
                if (book.getTitle().equalsIgnoreCase(title)) {
                        toRemove = book;
                        break;
                }
        }
        if (toRemove != null) {
                books.remove(toRemove);
                System.out.println(title + " removed from the library.");
        } else {
                System.out.println(title + " not found in the library.");
        }
}

// Display all books in the library
public void displayBooks() {
        if (books.isEmpty()) {
                System.out.println("The library is empty.");
        } else {
                for (Book book : books) {
                        System.out.println(book);
                }
        }
}

// Linear search for a book by title
public Book linearSearch(String title) {
        for (Book book : books) {
                if (book.getTitle().equalsIgnoreCase(title)) {
```

```
                return book;
            }
        }
        return null;
    }

    // Binary search for a book by title
    public Book binarySearch(String title) {
        int left = 0, right = books.size() - 1;
        while (left <= right) {
            int mid = (left + right) / 2;
            Book midBook = books.get(mid);
            int cmp = midBook.getTitle().compareToIgnoreCase(title);
            if (cmp == 0) {
                return midBook;
            } else if (cmp < 0) {
                left = mid + 1;
            } else {
                right = mid - 1;
            }
        }
        return null;
    }
}

public class LibraryManagementSystem {
    public static void main(String[] args) {
        Library library = new Library();
        Scanner scanner = new Scanner(System.in);
        int choice;
```

```
do {
        System.out.println("\nLibrary Management System");
        System.out.println("1. Add book to the library");
        System.out.println("2. Remove book from the library");
        System.out.println("3. Display all books");
        System.out.println("4. Search book by title (Linear Search)");
        System.out.println("5. Search book by title (Binary Search)");
        System.out.println("0. Exit");
        System.out.print("Enter your choice: ");
        choice = scanner.nextInt();
        scanner.nextLine();

        switch (choice) {
        case 1:
                System.out.print("Enter title: ");
                String title = scanner.nextLine();
                System.out.print("Enter author: ");
                String author = scanner.nextLine();
                System.out.print("Enter ISBN: ");
                String ISBN = scanner.nextLine();
                Book newBook = new Book(title, author, ISBN);
                library.addBook(newBook);
                break;
        case 2:
                System.out.print("Enter title of the book to remove: ");
                String titleToRemove = scanner.nextLine();
                library.removeBook(titleToRemove);
                break;
        case 3:
                library.displayBooks();
                break;
```

```
                case 4:
                        System.out.print("Enter title to search (Linear Search): ");
                        String titleToSearchLinear = scanner.nextLine();
                        long startTimeLinear = System.nanoTime();
                        Book foundBookLinear = library.linearSearch(titleToSearchLinear);
                        long endTimeLinear = System.nanoTime();
                        long durationLinear = endTimeLinear - startTimeLinear;
                        if (foundBookLinear != null) {
                                System.out.println("Book found: " + foundBookLinear);
                        } else {
                                System.out.println("Book not found.");
                        }
                System.out.println("Linear search took " + durationLinear + " milliseconds.");
                        break;
                case 5:
                        System.out.print("Enter title to search (Binary Search): ");
                        String titleToSearchBinary = scanner.nextLine();
                        long startTimeBinary = System.nanoTime();
                        Book foundBookBinary = library.binarySearch(titleToSearchBinary);
                        long endTimeBinary = System.nanoTime();
                        long durationBinary = endTimeBinary - startTimeBinary;
                        if (foundBookBinary != null) {
                                System.out.println("Book found: " + foundBookBinary);
                        } else {
                                System.out.println("Book not found.");
                        }
        System.out.println("Binary search took " + durationBinary + " milliseconds.");
                        break;
                case 0:
                        System.out.println("Exiting...");
                        break;
```

```
                default:
                        System.out.println("Invalid choice. Please try again.");
                }
            } while (choice != 0);

            scanner.close();
        }
}
```
OUTPUT::::

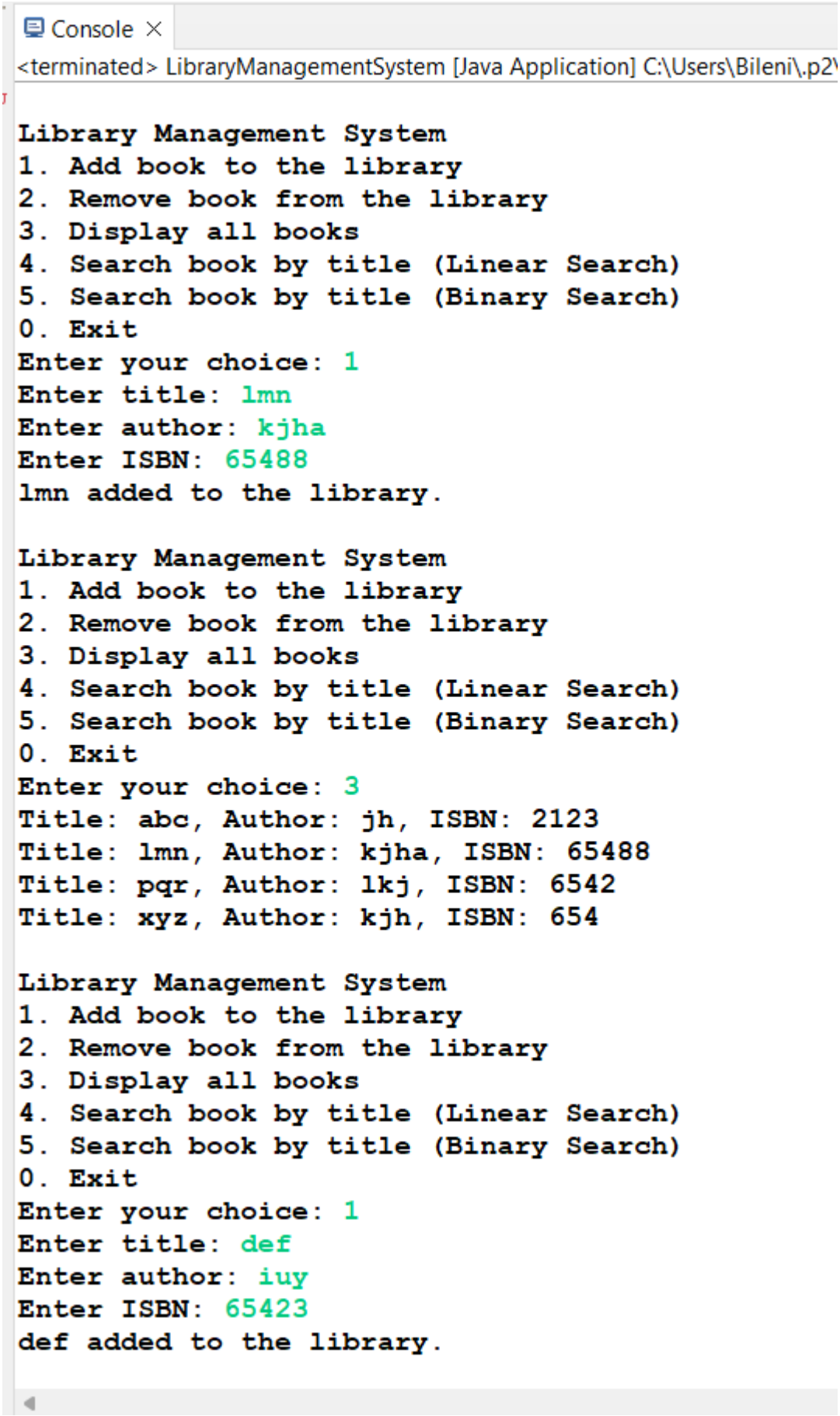
Console ×

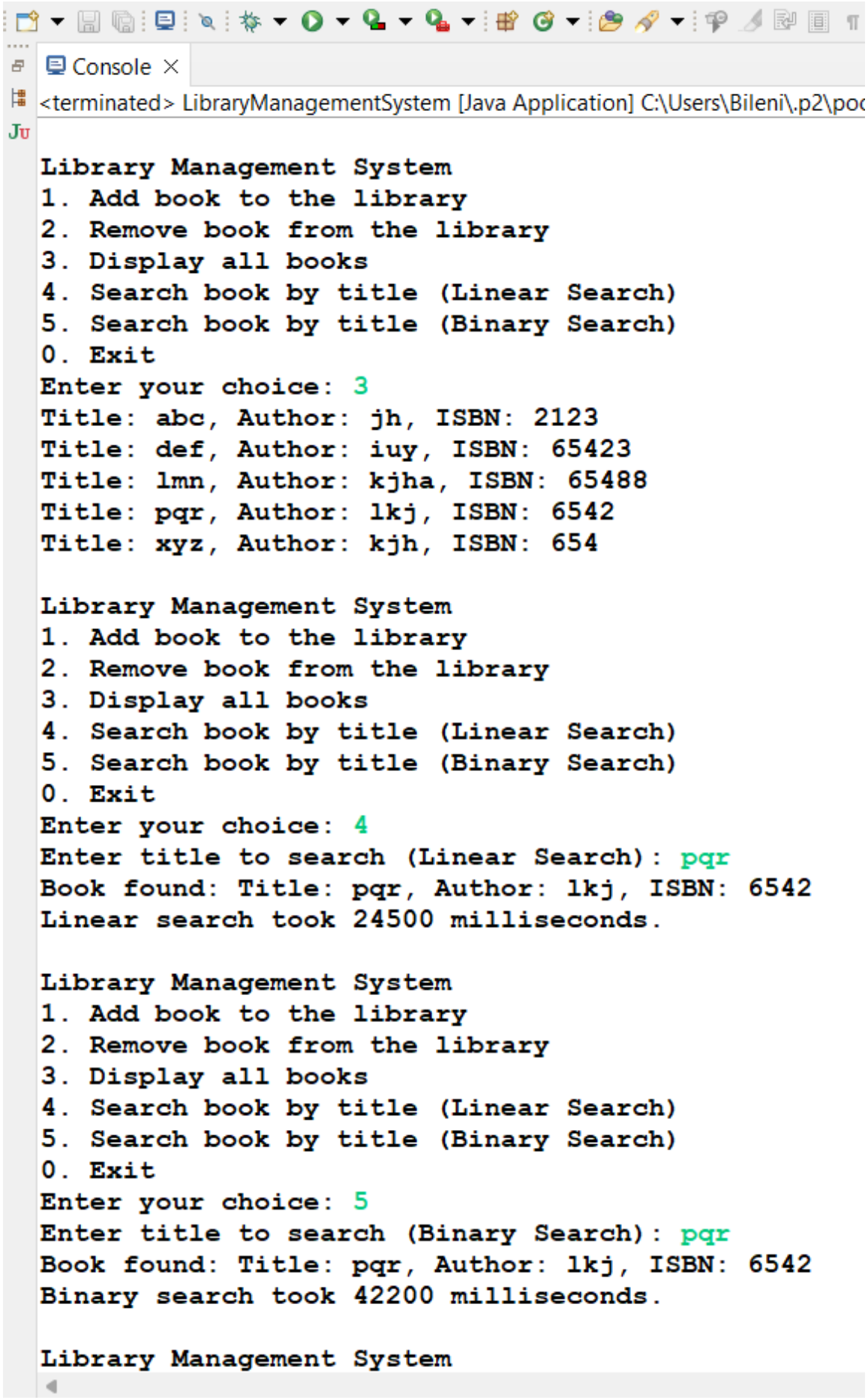
<terminated> LibraryManagementSystem [Java Application] C:\Users\

```
Library Management System
1. Add book to the library
2. Remove book from the library
3. Display all books
4. Search book by title (Linear Search)
5. Search book by title (Binary Search)
0. Exit
Enter your choice: 1
Enter title: abc
Enter author: jh
Enter ISBN: 2123
abc added to the library.

Library Management System
1. Add book to the library
2. Remove book from the library
3. Display all books
4. Search book by title (Linear Search)
5. Search book by title (Binary Search)
0. Exit
Enter your choice: 1
Enter title: xyz
Enter author: kjh
Enter ISBN: 654
xyz added to the library.

Library Management System
1. Add book to the library
2. Remove book from the library
3. Display all books
4. Search book by title (Linear Search)
5. Search book by title (Binary Search)
0. Exit
Enter your choice: 1
Enter title: pqr
Enter author: lkj
Enter ISBN: 6542
pqr added to the library.
```


Console
<terminated> LibraryManagementSystem [Java Application] C:\Users\Bileni\.p2
Library Management System
1. Add book to the library
2. Remove book from the library
3. Display all books
4. Search book by title (Linear Search)
5. Search book by title (Binary Search)
0. Exit
Enter your choice: 1
Enter title: lmn
Enter author: kjha
Enter ISBN: 65488
lmn added to the library.
Library Management System
1. Add book to the library
2. Remove book from the library
3. Display all books
4. Search book by title (Linear Search)
5. Search book by title (Binary Search)
0. Exit
Enter your choice: 3
Title: abc, Author: jh, ISBN: 2123
Title: lmn, Author: kjha, ISBN: 65488
Title: pqr, Author: lkj, ISBN: 6542
Title: xyz, Author: kjh, ISBN: 654
Library Management System
1. Add book to the library
2. Remove book from the library
3. Display all books
4. Search book by title (Linear Search)
5. Search book by title (Binary Search)
0. Exit
Enter your choice: 1
Enter title: def
Enter author: iuy
Enter ISBN: 65423
def added to the library.


Console
<terminated> LibraryManagementSystem [Java Application] C:\Users\Bileni\.p2\poo
Library Management System
1. Add book to the library
2. Remove book from the library
3. Display all books
4. Search book by title (Linear Search)
5. Search book by title (Binary Search)
0. Exit
Enter your choice: 3
Title: abc, Author: jh, ISBN: 2123
Title: def, Author: iuy, ISBN: 65423
Title: lmn, Author: kjha, ISBN: 65488
Title: pqr, Author: lkj, ISBN: 6542
Title: xyz, Author: kjh, ISBN: 654
Library Management System
1. Add book to the library
2. Remove book from the library
3. Display all books
4. Search book by title (Linear Search)
5. Search book by title (Binary Search)
0. Exit
Enter your choice: 4
Enter title to search (Linear Search): pqr
Book found: Title: pqr, Author: lkj, ISBN: 6542
Linear search took 24500 milliseconds.
Library Management System
1. Add book to the library
2. Remove book from the library
3. Display all books
4. Search book by title (Linear Search)
5. Search book by title (Binary Search)
0. Exit
Enter your choice: 5
Enter title to search (Binary Search): pqr
Book found: Title: pqr, Author: lkj, ISBN: 6542
Binary search took 42200 milliseconds.
Library Management System

The List is in sorted order so the Linear search is best. It taken less time to search