**Library Management System**

Java-based library management system that enables efficient book management, borrowing operations, and advanced search capabilities.

**Introduction**

This Library Management System is a robust command-line application designed for efficient library management.

**Key Features**

• **Complete book management**: Add, remove, and update books.

• **Multi-criteria search functionality**: Search by title, author, category, or email.

• **Borrowing and return tracking**: Efficient management of book loans.

• **Quantity management**: Track available copies of each book.

• **Data persistence**: Real-time updates to the library’s inventory.

• **Input validation**: Ensure accurate data entries.

• **Error handling**: Graceful handling of common user errors.

**Benefits**

• **User-friendly command-line interface** for seamless interactions.

• **Enhanced search capabilities** to locate books quickly.

• **Reliable inventory management** for efficient tracking.

• **User accountability** through email verification.

**Commands and Usage**

|  |  |  |  |
| --- | --- | --- | --- |
| Command | Format | Description | Example |
| add/insert | add <title> <author> <category> <email> <quantity> | Add a new book to the library | add "Java Programming" "John Doe" "Programming" "john@email.com" 5 |
| remove/delete | remove <title> | Remove a book from the library | remove "Java Programming" |
| find/search | find by <title/author/category/email> <query> | Search for books | find by author "John Doe" |
| print/list | print | Display all books | print |
| borrow | borrow <title> | Borrow a book from the library | borrow "Java Programming" |
| return | return <title> | Return a book to the library | return "Java Programming" |
| help | help | Display available commands | help |
| exit/quit | exit | Exit the application | exit |

**Notes:**

• Enclose book **titles** with spaces in **quotes**.

• Ensure **email addresses** follow a valid format.

• **Quantity** must be a positive integer.

• Commands are **case-insensitive**.

**Help Guide**

**To use the Library Management System:**

1. Start the application.

2. Use the available commands from the table above.

3. Follow the command format precisely.

4. Type help at any time to view available commands.

**System Design**

**Use Case Diagram**

A diagram of a library management system

Description automatically generated

**Class Diagram**

A computer screen shot of a computer code

Description automatically generated

**Error Handling**

The system manages several error scenarios gracefully:

• Invalid command format

• Book not found

• Insufficient book quantity

• Invalid email format

• Duplicate book entries

• Invalid quantity values