Library Inventory System

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https://github.com/Isomorphismss/CSCI-UA-470-Final-Project

Group# OOP_Project 1
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Date of Submission: 12/14/2023

Table of Work

(Please write x in the boxes to mention what each student achieved in this project)

	Student-1 Name	Student-2 Name
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System Analysis

Project Description

- **General Description:** Our Library Inventory System is an intuitive and efficient platform designed to enhance book management and accessibility. It offers a range of functions, including the ability to add, search, lend, and browse books, as well as update book information, delete entries, view all lent books, and return books. The system is crafted with the goal of providing a user-friendly and convenient service for book management, a feature relatively rare in the current market. It has a well-organized structure and an easy-to-navigate interface, ensuring a comfortable experience for users.
- **System input(s) and output(s):**
  - Adding a Book: Users input details such as the title, author, ISBN, genre, and quantity.
  - Searching for a Book: Inputs include search queries like title, author, ISBN, and genre, with the output being a list of books matching these criteria.
  - Lending a Book: The input required is the borrower's name and the due date.
  - Browsing All Books: The output is a comprehensive list of all books available in the library.
  - Updating Book Information: Users input the updated details of a selected book, with the output being an updated list of books.
  - Deleting a Book: The output is the updated list of available books post-deletion.
  - Viewing Lent Books: The output includes information on all currently lent books.
  - Returning a Book: The output is the updated list of lent books after the return.

Use case diagrams and descriptions

UC Reference Name/Number	Add a Book (UC1)
Overview	Users can add a new book to the library inventory system, including information about title, author, ISBN, genre, and quantity.
Related use cases	N/A
Actors	User

UC Reference Name/Number	Search For a Book (UC2)
Overview	The user can search the book in the library inventory system by title, author, ISBN, and genre.
Related use cases	Lend this book (UC5), show lending record of this book (UC6)
Actors	User

UC Reference Name/Number	Browse All Books (UC3)
Overview	Users can view all their added books' details stored in the library inventory system.
Related use cases	Update Book information (UC7), Delete Books (UC8)
Actors	User

UC Reference Name/Number	View All Lent Books (UC4)
Overview	Users can view all the lent books' details stored in the library inventory system
Related use cases	Return this book (UC9)
Actors	User

UC Reference Name/Number	Lend This Book (UC5)
Overview	Users can lend a book from the library inventory system
Related use cases	Search for a Book (UC2)
Actors	User

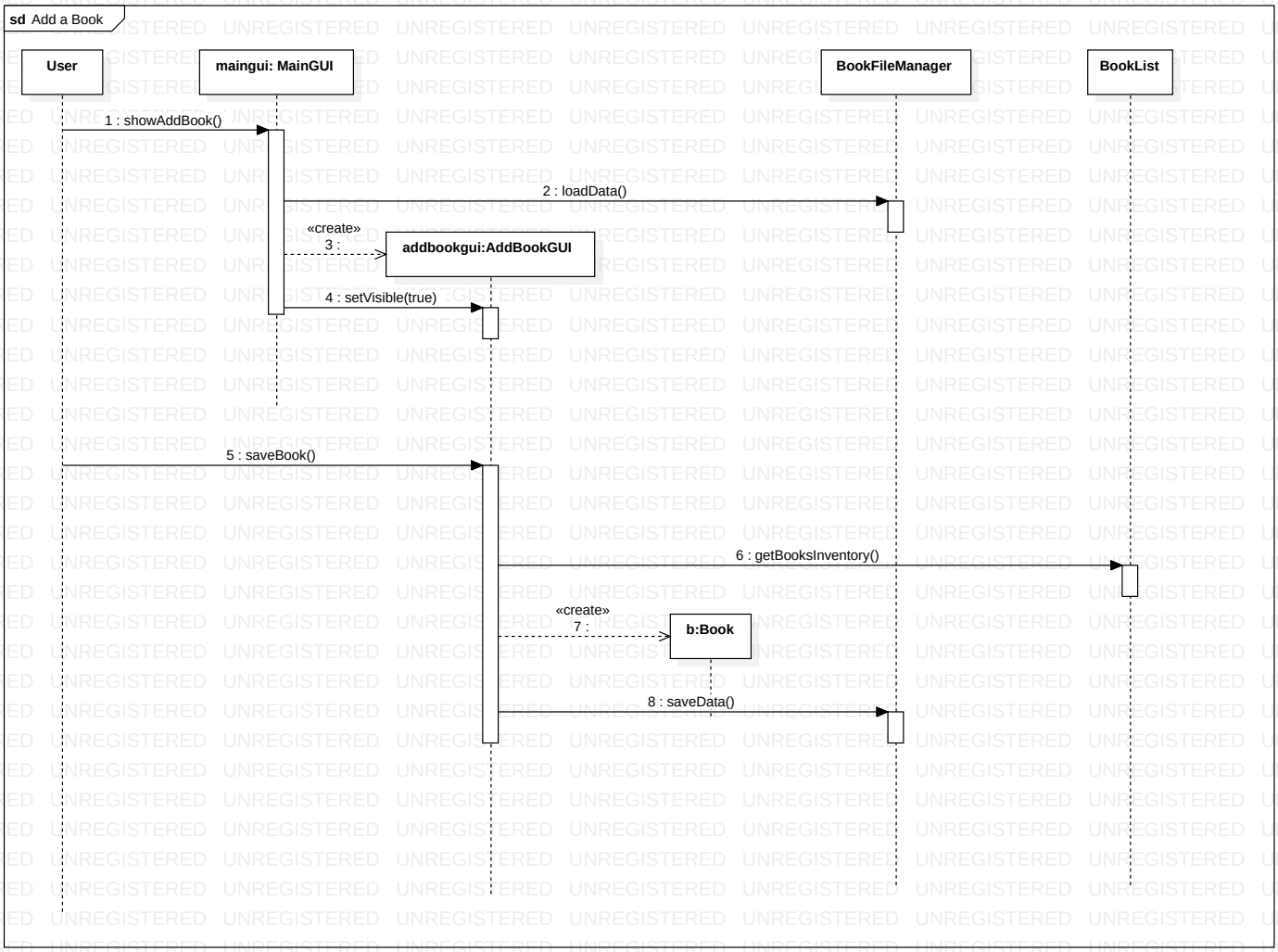
UC Reference Name/Number	Show Lending Record of This Book (UC6)
Overview	Users can show the lending record of a specific book from the library inventory system
Related use cases	Search For a Book (UC2)
Actors	User

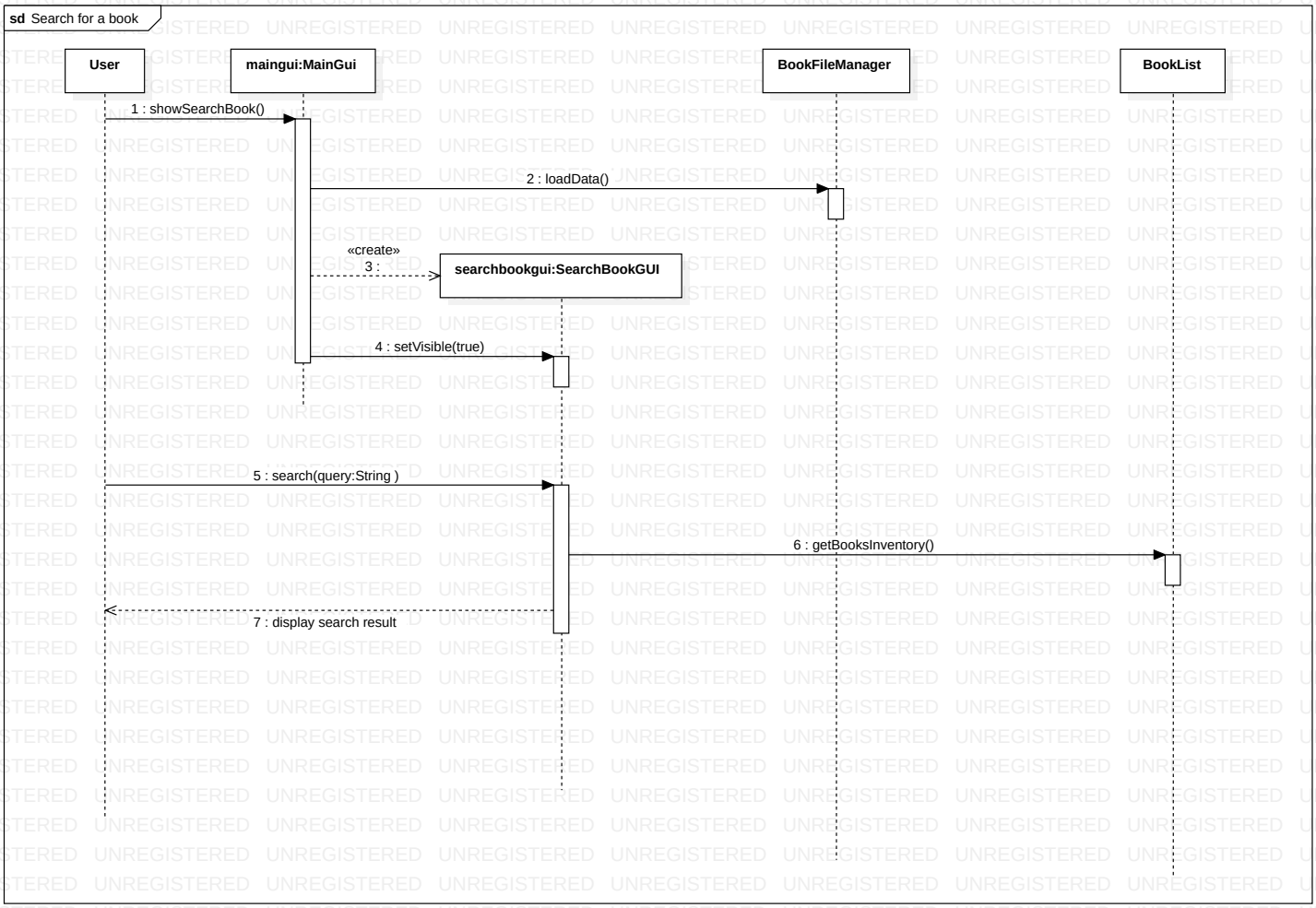
UC Reference Name/Number	Update Book information (UC7)
Overview	Users can update the information (title, author, ISBN, genre, and quantity) of the selected book
Related use cases	Browse All Books (UC3)
Actors	User

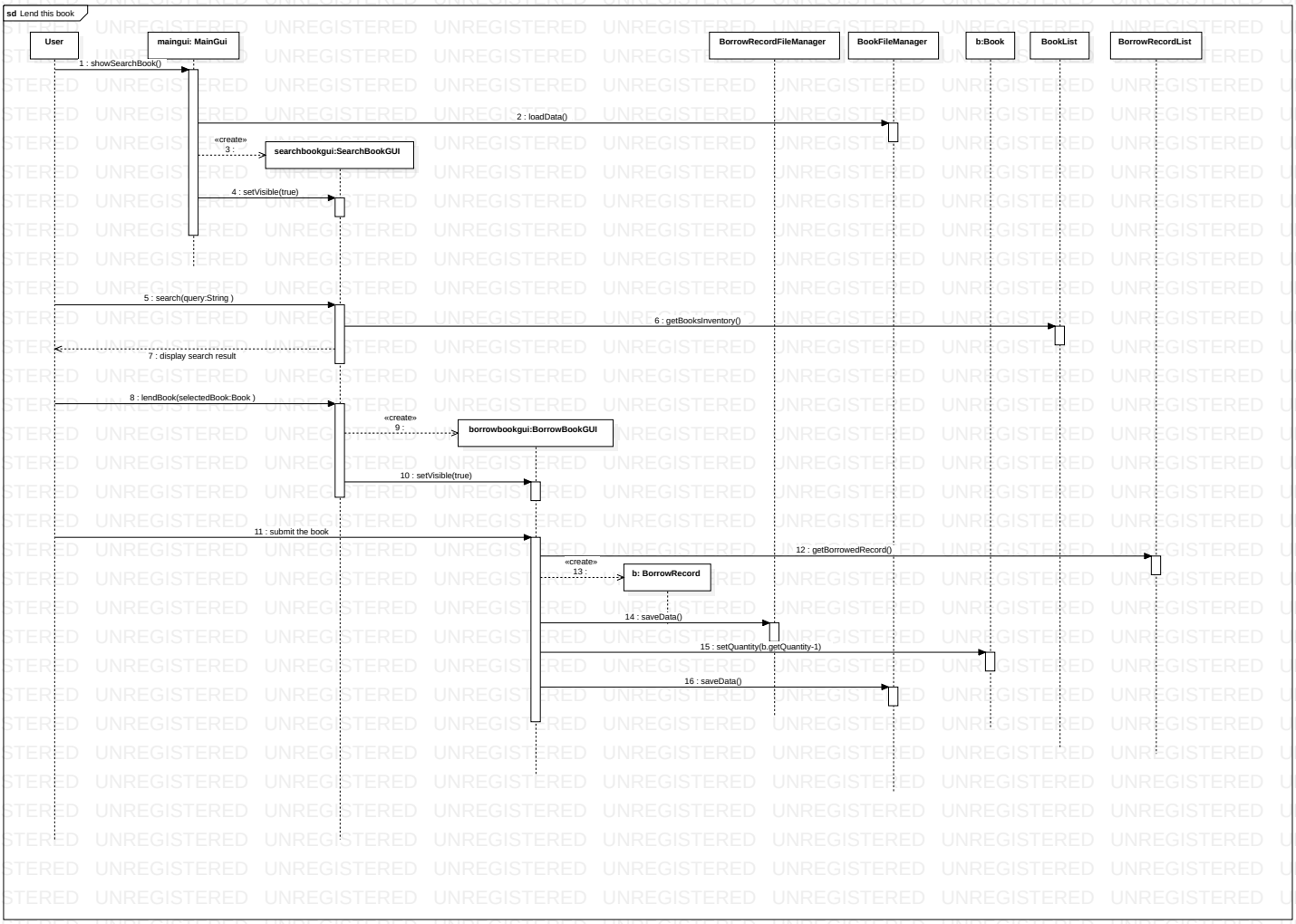
UC Reference Name/Number	Delete a Book (UC8)
Overview	Users can delete a book from the library inventory system
Related use cases	Browse All Books (UC3)
Actors	User

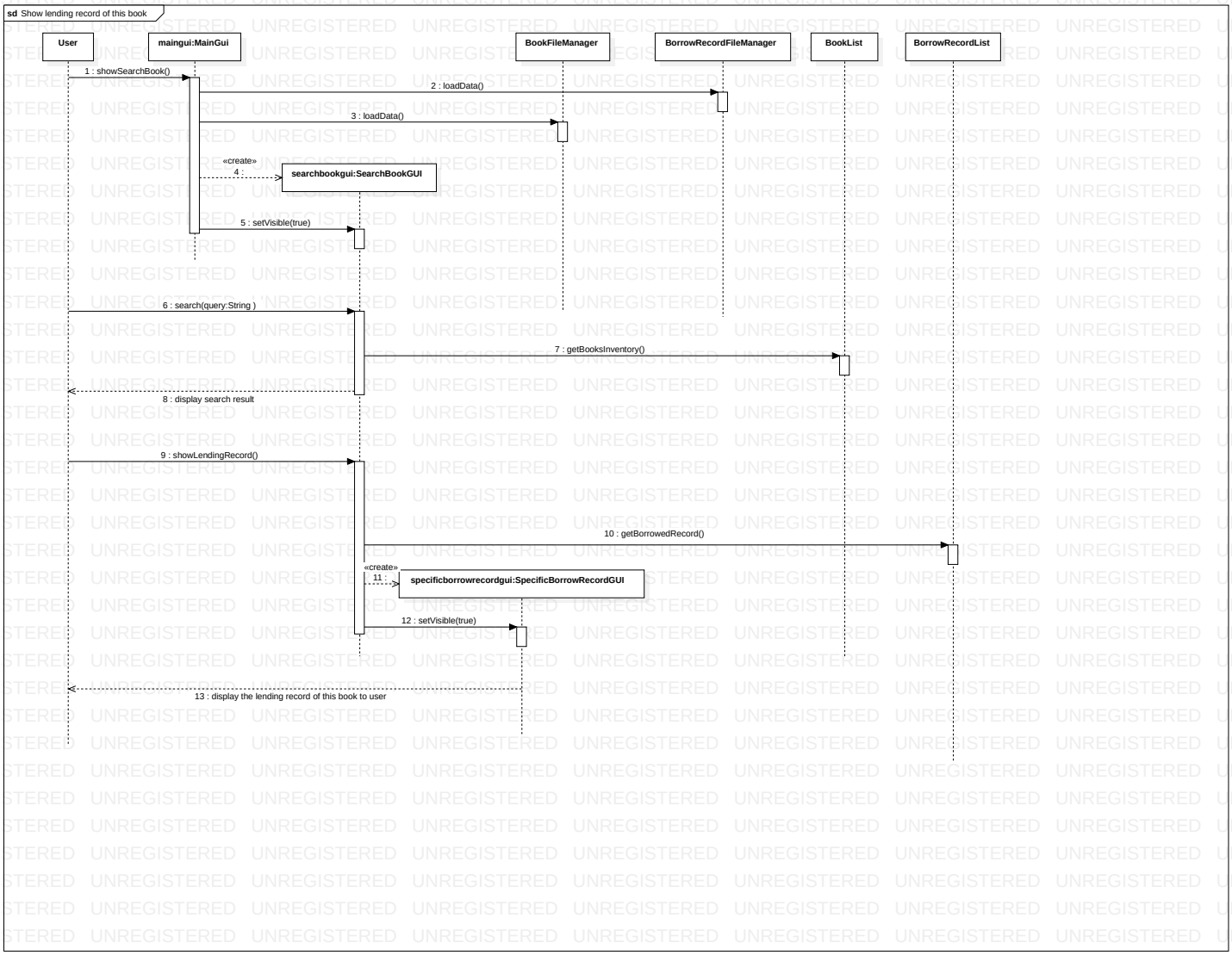
UC Reference Name/Number	Return This Book (UC9)
Overview	Users can return a book to the library inventory system, and then this book are able to be borrowed again
Related use cases	View All Lent Books (UC4)
Actors	User

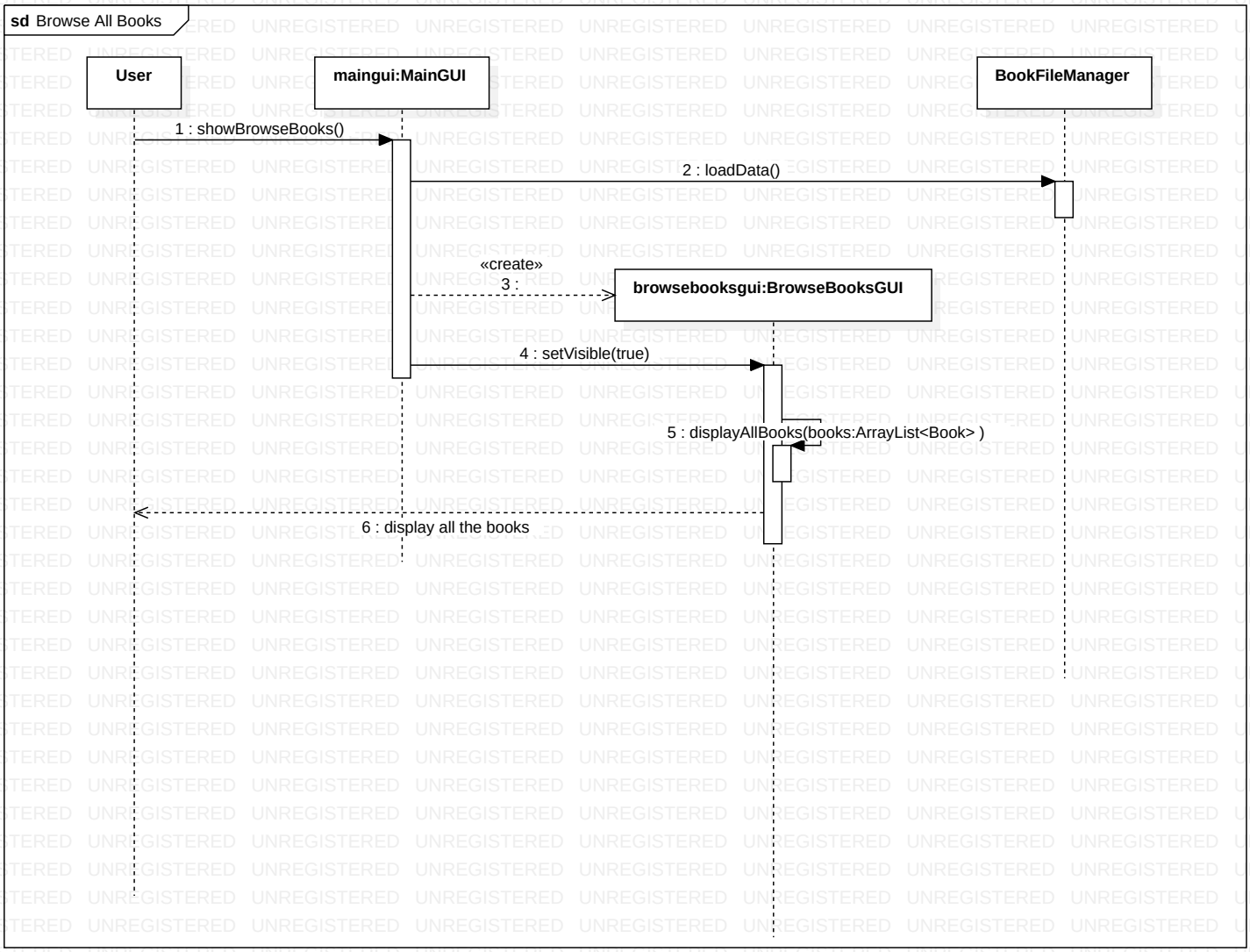
Sequence Diagrams

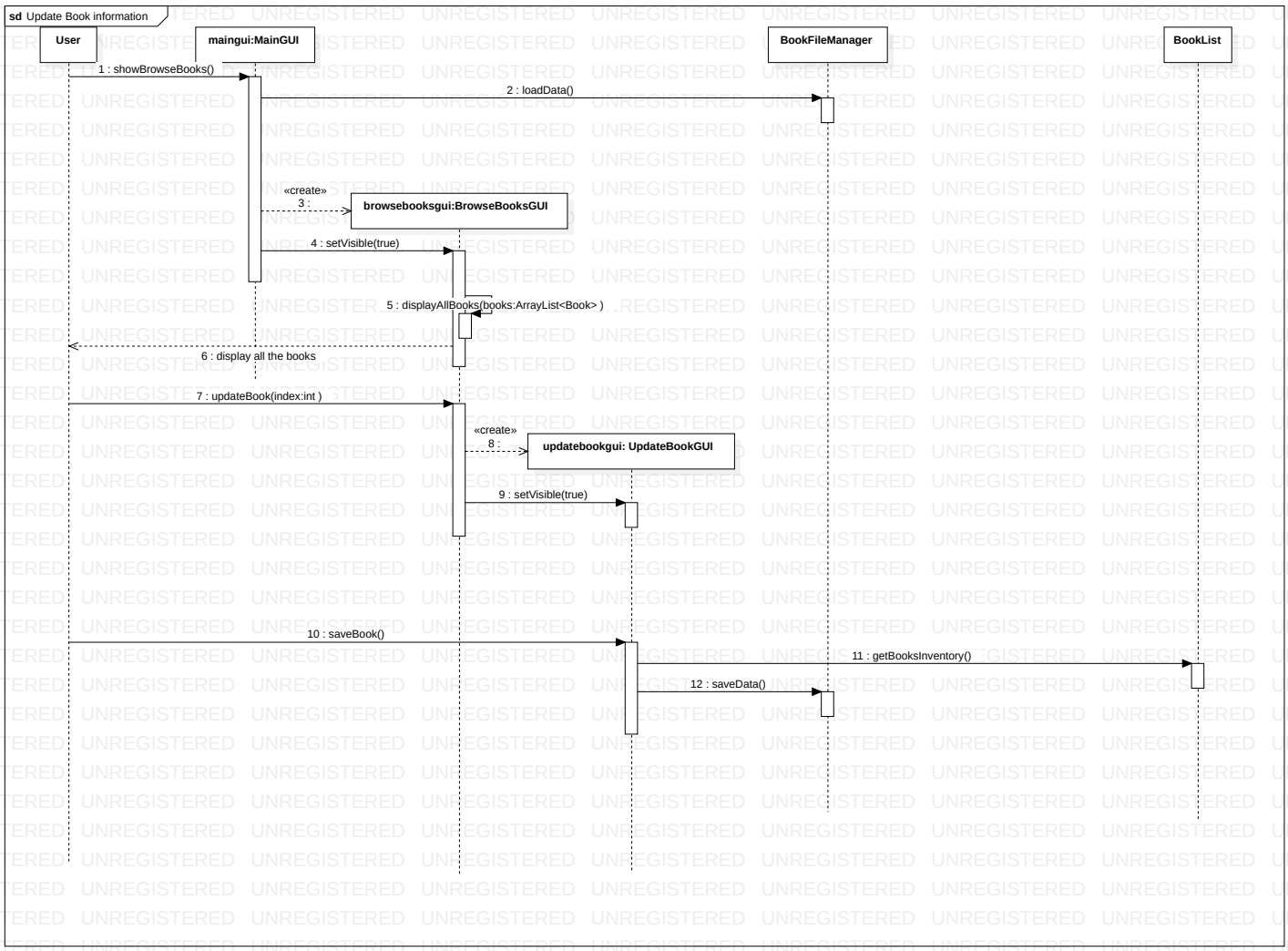


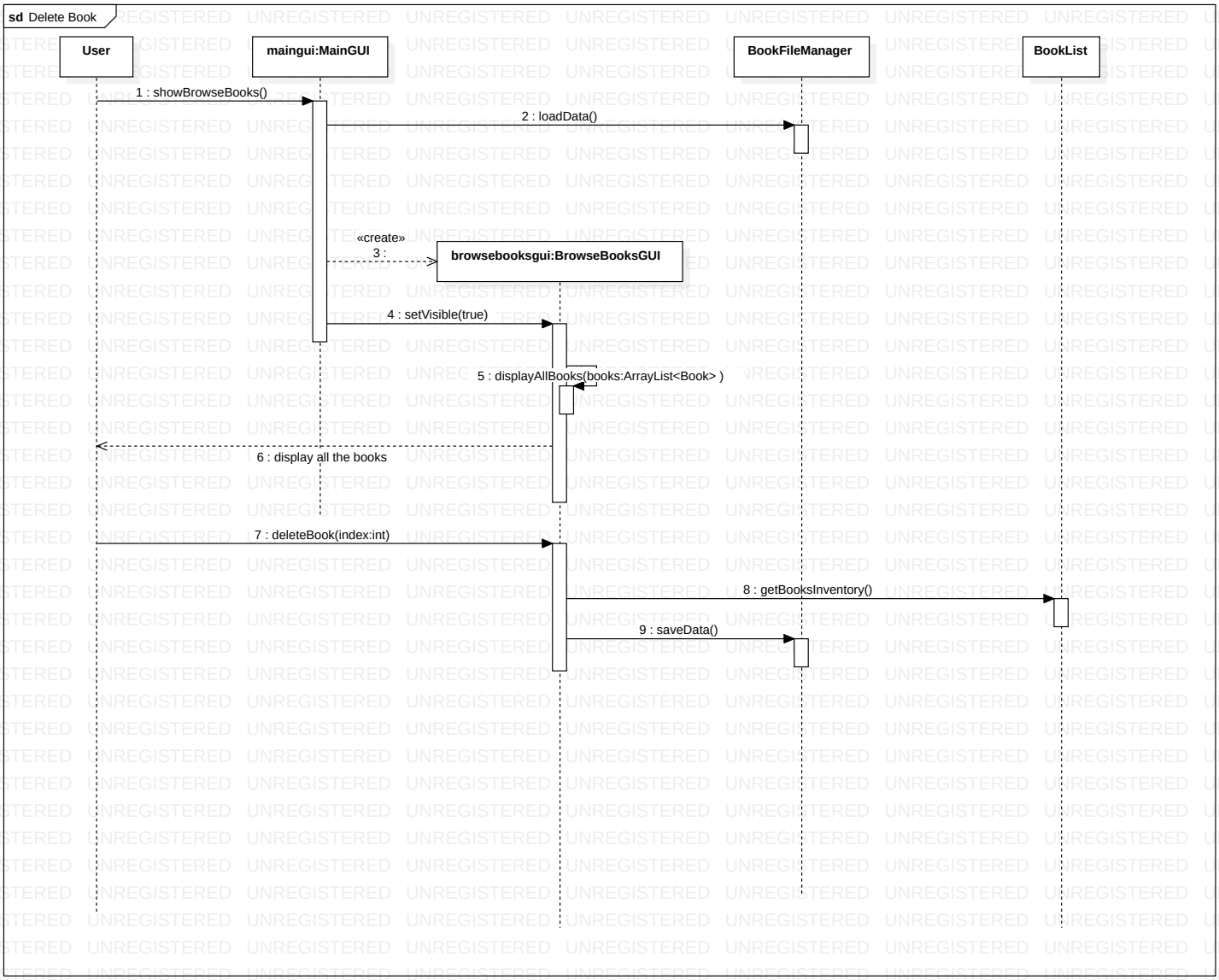

sd Search for a book
User
maingui:MainGui
BookFileManager
BookList
1 : showSearchBook()
2 : loadData()
«create»
3 :
searchbookgui:SearchBookGUI
4 : setVisible(true)
5 : search(query:String)
6 : getBooksInventory()
7 : display search result

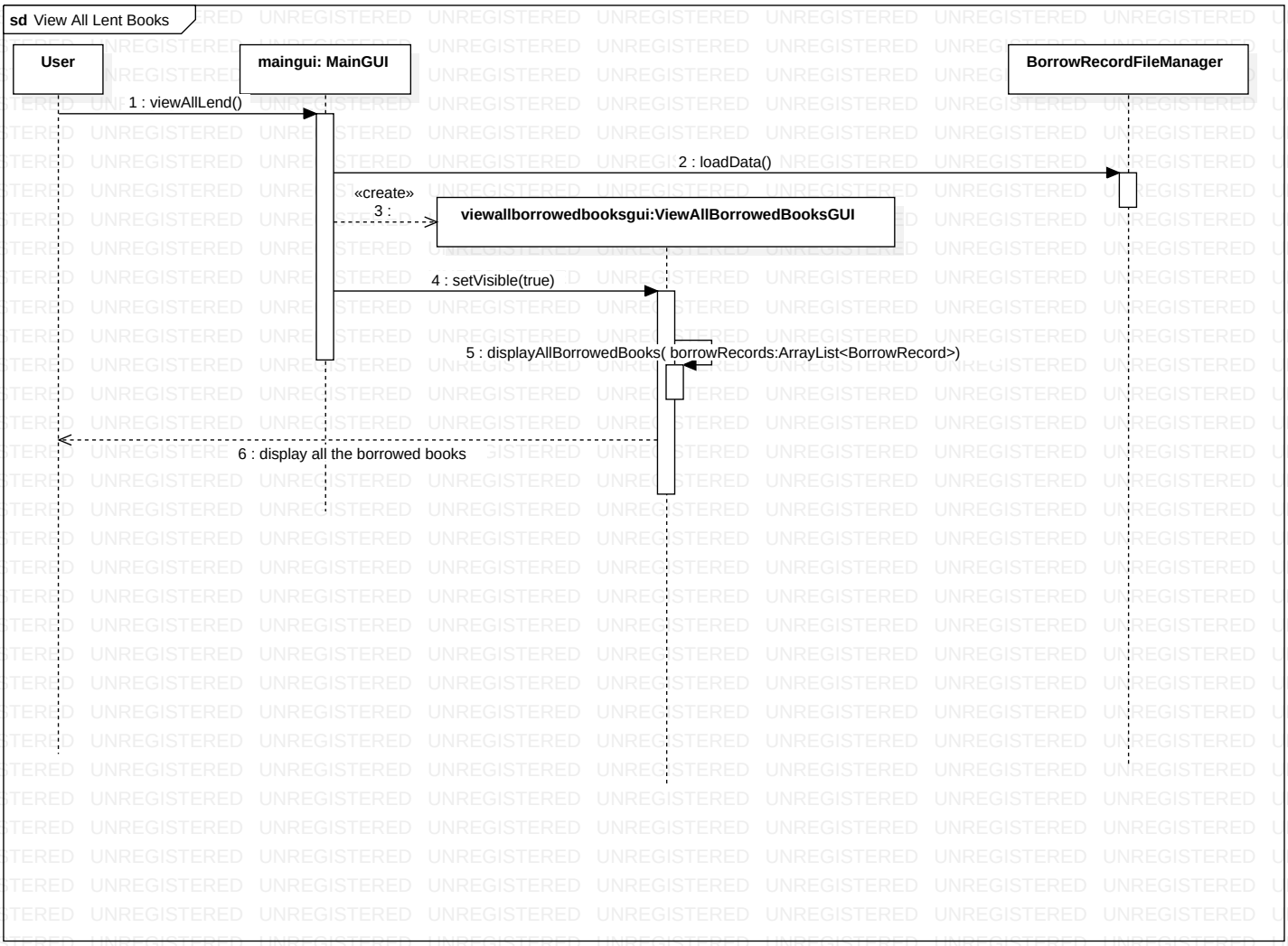

sd Lend this book
User
maingui: MainGui
BorrowRecordFileManager
BookFileManager
b:Book
BookList
BorrowRecordList
1 : showSearchBook()
2 : loadData()
«create»
3 :
searchbookgui:SearchBookGUI
4 : setVisible(true)
5 : search(query:String)
6 : getBooksInventory()
7 : display search result
8 : lendBook(selectedBook:Book)
«create»
9 :
borrowbookgui:BorrowBookGUI
10 : setVisible(true)
11 : submit the book
12 : getBorrowedRecord()
«create»
13 :
b: BorrowRecord
14 : saveData()
15 : setQuantity(b.getQuantity-1)
16 : saveData()

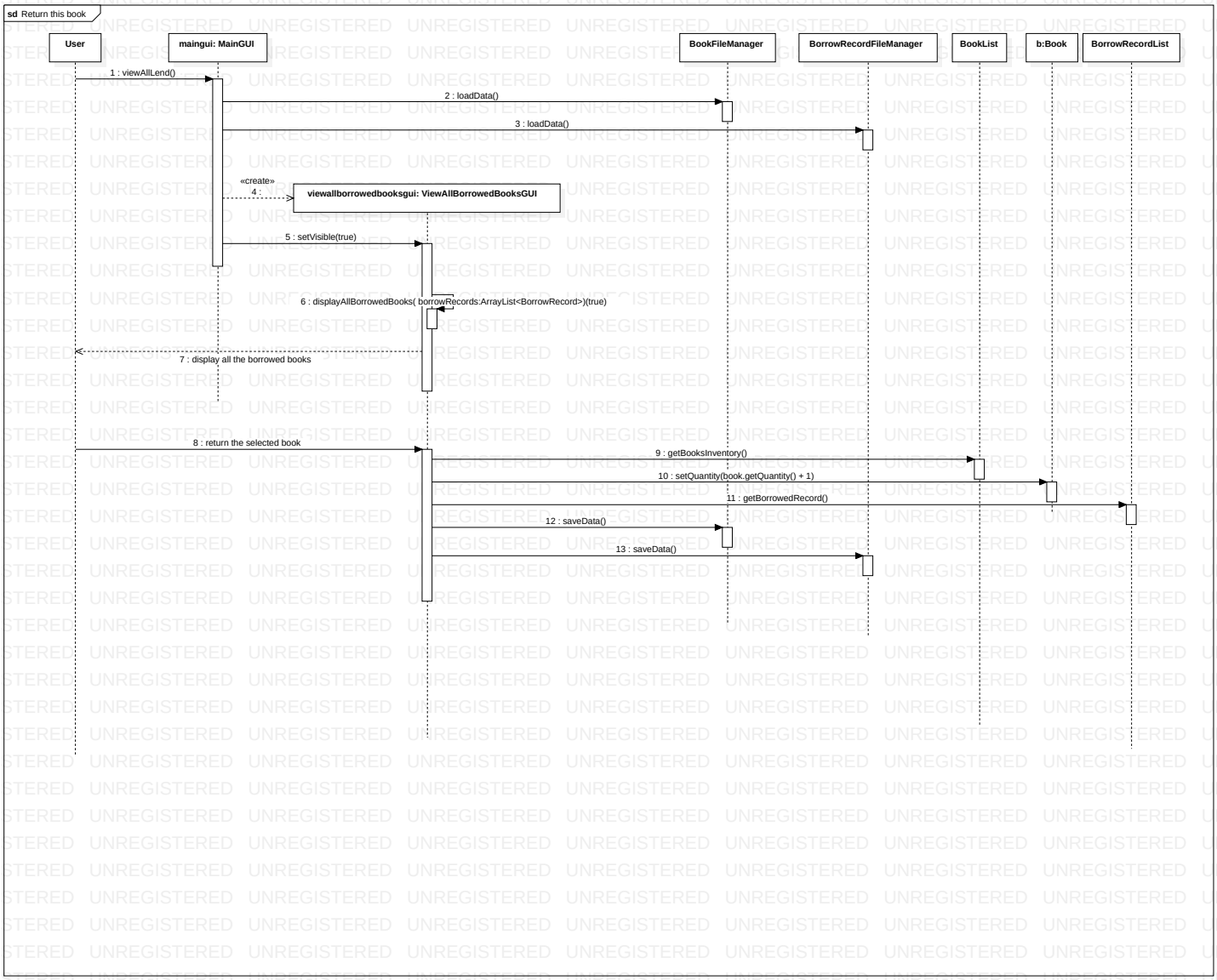

sd Show lending record of this book
User
maingui:MainGui
BookFileManager
BorrowRecordFileManager
BookList
BorrowRecordList
1 : showSearchBook()
2 : loadData()
3 : loadData()
«create»
4 :
searchbookgui:SearchBookGUI
5 : setVisible(true)
6 : search(query:String)
7 : getBooksInventory()
8 : display search result
9 : showLendingRecord()
10 : getBorrowedRecord()
«create»
11 :
specificborrowrecordgui:SpecificBorrowRecordGUI
12 : setVisible(true)
13 : display the lending record of this book to user


sd Browse All Books
User
maingui:MainGUI
BookFileManager
1 : showBrowseBooks()
2 : loadData()
«create»
3 :
browsebooksgui:BrowseBooksGUI
4 : setVisible(true)
5 : displayAllBooks(books:ArrayList<Book>)
6 : display all the books

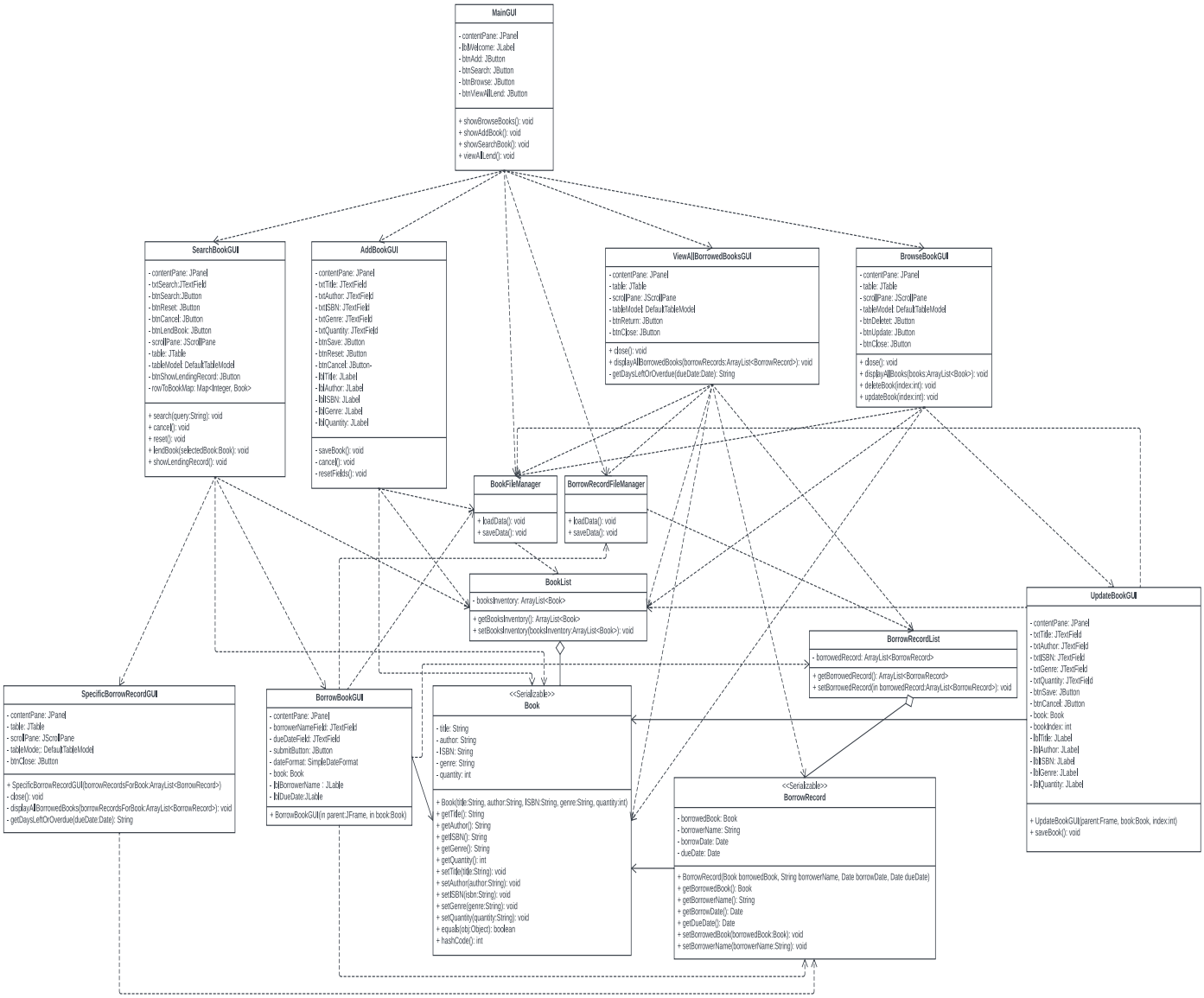

sd Update Book information
User
maingui:MainGUI
BookFileManager
BookList
1 : showBrowseBooks()
2 : loadData()
«create»
3 :
browsebooksgui:BrowseBooksGUI
4 : setVisible(true)
5 : displayAllBooks(books:ArrayList<Book>)
6 : display all the books
7 : updateBook(index:int)
«create»
8 :
updatebookgui: UpdateBookGUI
9 : setVisible(true)
10 : saveBook()
11 : getBooksInventory()
12 : saveData()


sd Delete Book
User
maingui:MainGUI
BookFileManager
BookList
1 : showBrowseBooks()
2 : loadData()
«create»
3 :
browsebooksgui:BrowseBooksGUI
4 : setVisible(true)
5 : displayAllBooks(books:ArrayList<Book>)
6 : display all the books
7 : deleteBook(index:int)
8 : getBooksInventory()
9 : saveData()


sd View All Lent Books
User
maingui: MainGUI
BorrowRecordFileManager
1 : viewAllLend()
2 : loadData()
«create»
3 :
viewallborrowedbooksgui:ViewAllBorrowedBooksGUI
4 : setVisible(true)
5 : displayAllBorrowedBooks(borrowRecords:ArrayList<BorrowRecord>)
6 : display all the borrowed books


sd Return this book
User
maingui: MainGUI
BookFileManager
BorrowRecordFileManager
BookList
b:Book
BorrowRecordList
1 : viewAllLend()
2 : loadData()
3 : loadData()
«create»
4 :
viewallborrowedbooksgui: ViewAllBorrowedBooksGUI
5 : setVisible(true)
6 : displayAllBorrowedBooks(borrowRecords:ArrayList<BorrowRecord>)(true)
7 : display all the borrowed books
8 : return the selected book
9 : getBooksInventory()
10 : setQuantity(book.getQuantity() + 1)
11 : getBorrowedRecord()
12 : saveData()
13 : saveData()

Class Diagram



Conclusion: Our Library Inventory System is a simple yet effective solution for basic library management needs. Moving forward, we are committed to enhancing its capabilities, aiming to develop a comprehensive Library Inventory System that incorporates a variety of advanced functionalities.