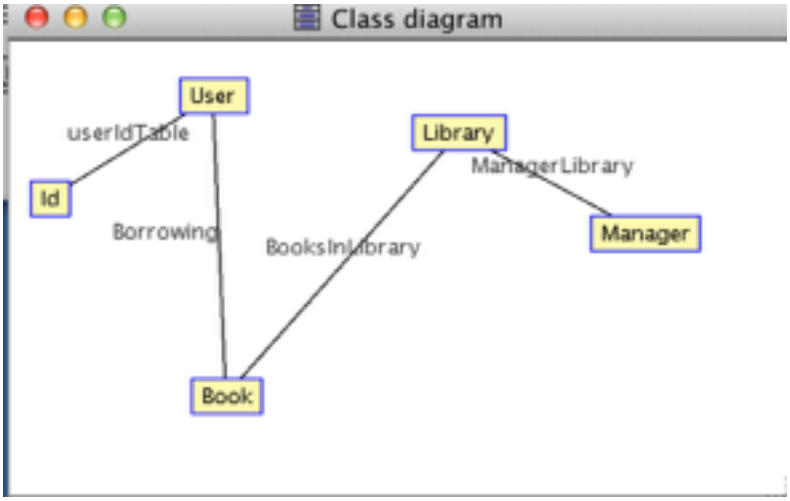
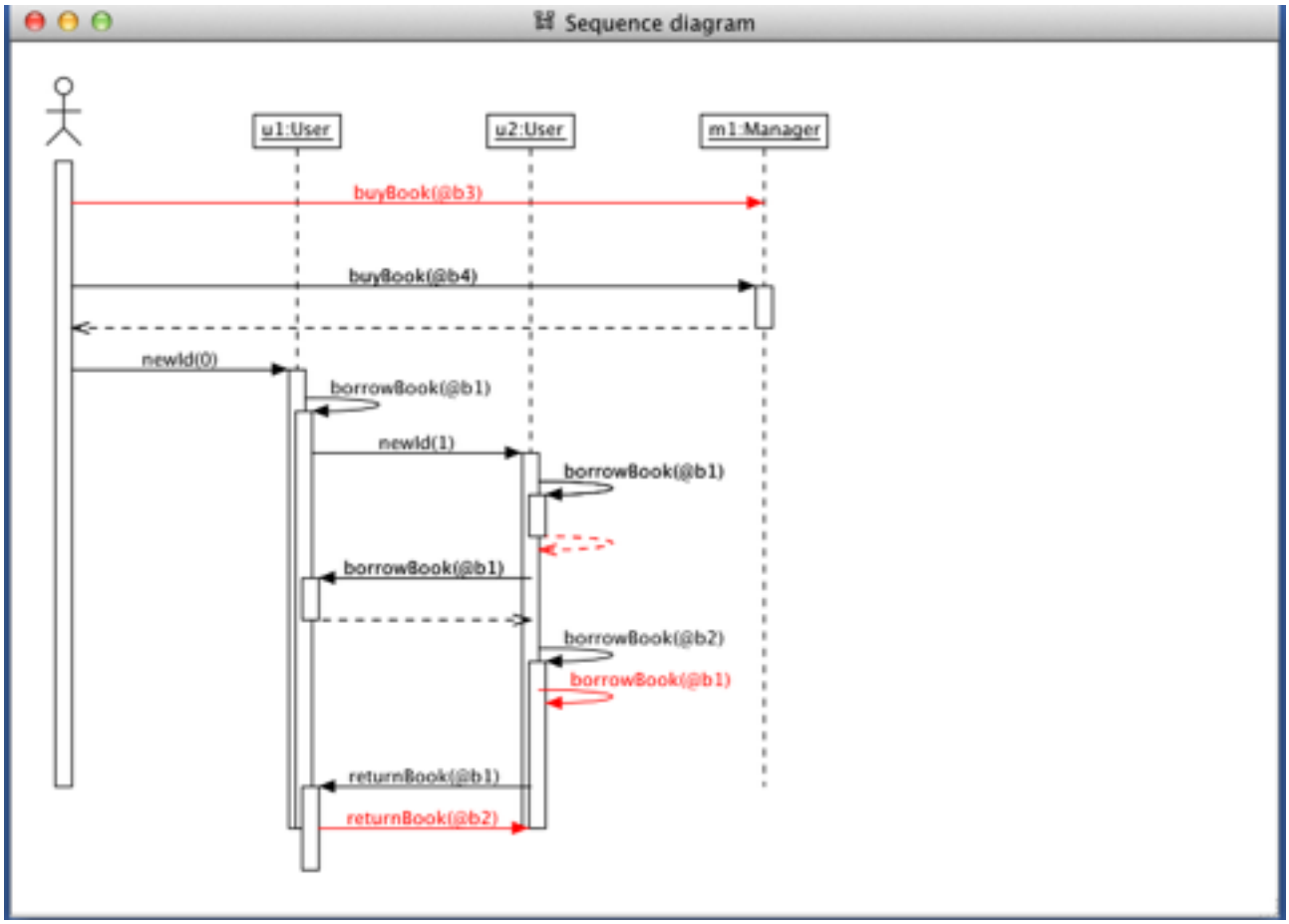
The Model Of Library Management System

Classes: User, Id, Book, Library, Manager.

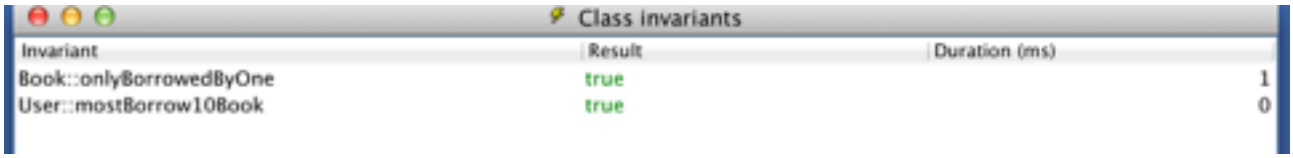


Every user has a unique id, and can borrow at most 10 books.Every book can be borrowed most by one user.A library can have many books in it and can have at least manager.The user can borrow and return books, whereas manager can buy books for the library.

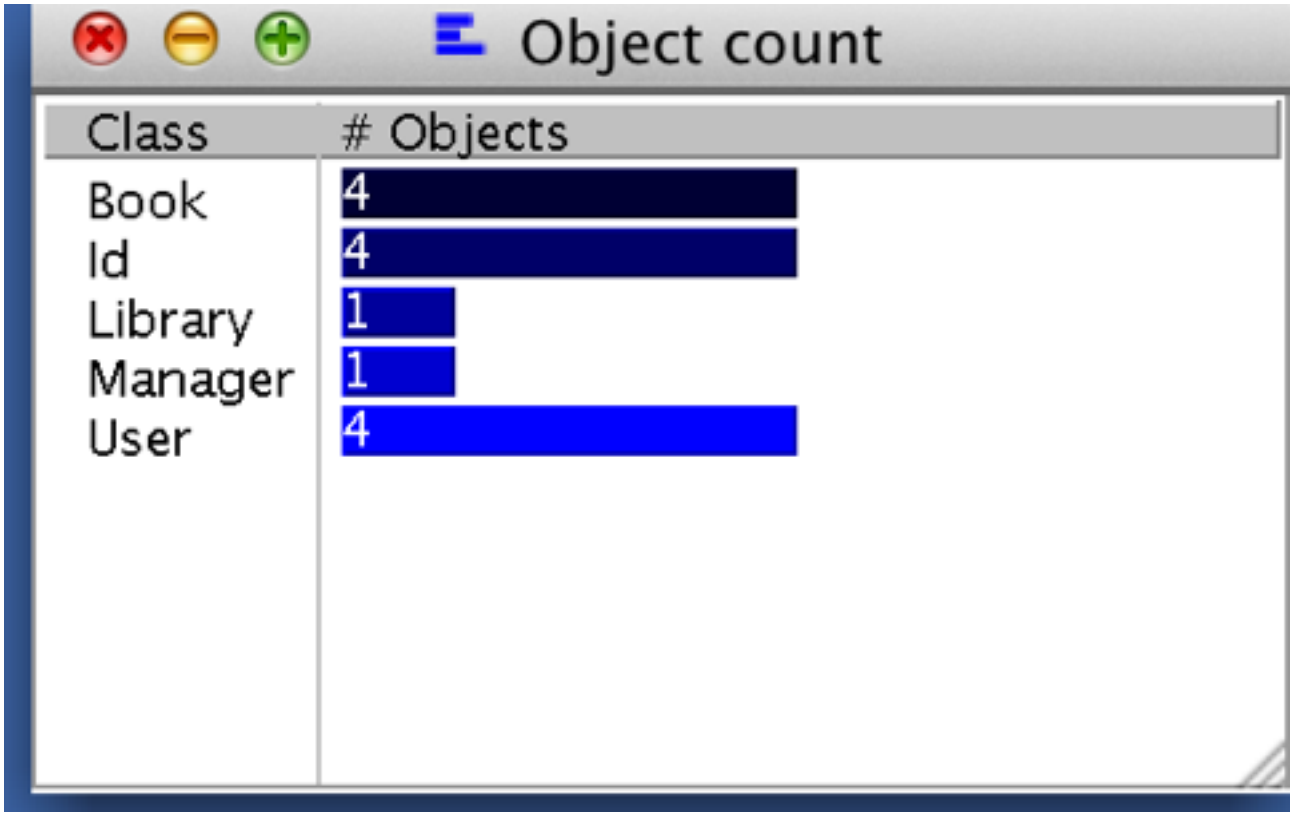
The Sequence Diagram



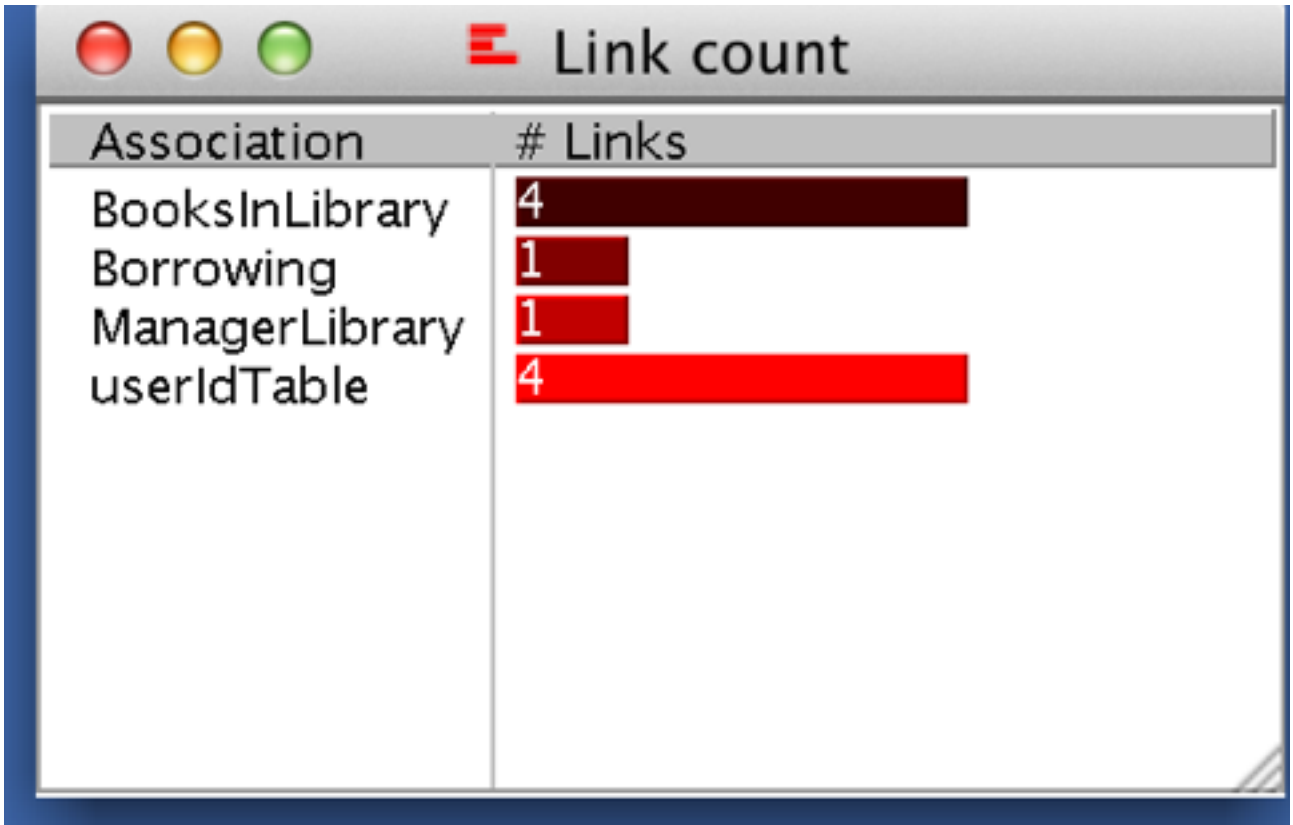
The Class Invariant



The Object Count



The Link Count



According to this description, I write the associations and constraints for them.

Associations:

Library 1 * Book
Library 1 1..* Manager
User 0..1 * Book

constraints:

I set the maximum number of books a user can borrow as 10, so
User.borrowBook.size <= 10

Book.borrower.size <=1
A book can borrowed by at most one user.

When a user borrows book, the **precondition** is that the book is not borrowed yet and the number of books the user has borrowed is less than 10 and the **postcondition** is that the book added to borrower's borrowed books collection and the user added to book's borrower collection.

When a user returns book, the **precondition** is that the book has been borrowed by this user before.The **postcondition** is that the book is removed from borrower's books collection.

When a manager buys book for the library, the **precondition** is that the library doesn't have the book, the **postcondition** is that the book added to the manager's library.